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Otoplasty: A Composite Technique for Improved Results

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ABSTRACT

Congenital ear deformities especially prominent ear are relatively frequent and commonly associated with underdevelopment of antihelical fold and conchal hypertrophy. This study was carried out on thirty patients with prominent ears in the period from January 2008 to January 2010. Twenty four of them were presented by bilateral prominent (bat) ear and six of them were presented by unilateral prominent (bat) ear. The demographic distribution of this group was as follows: Twenty males and ten females, the ages ranged between 6 to 30 years. In general, the procedure used for the surgical correction of protruding ears (otoplasty) is a combination of incision, scoring and suturing techniques. Patients were followed-up for a period ranging between 6 and 18 months. Satisfactory results were obtained in twenty six patients (86.6%) and complications occurred in four patients (13.3%), three cases of recurrence and one case with wound infection.

INTRODUCTION

In 1968, McDowell **[1]** proposed that the goals of a successful otoplasty includes: (1) the protrusion in the upper third of the ear should be eliminated; (2) the helix of both ears should be seen lateral to the antihelix from the front view; (3) the helix should have a smooth and regular contour throughout; (4) the postauricular sulcus should not be markedly decreased or disturbed; (5) the ear should not be placed too close to the head, especially in males; and (6) the contours and position of the two ears should match closely but not be symmetrical. The helical rim of the naturally appearing ear is located 16 to 21mm from the temporomastoid surface of the skull at the point of maximum prominence **[2]**. The prominent ear is defined when this distance is exceeded. Da Silva Freitas et al. **[3]** concluded that measuring cephaloauricular and scaphoconchal angles may help in diagnosis of protruding ears.

PATIENTS AND METHODS

This study was carried out on thirty patients at the plastic and reconstruction surgery department in Al-Azhar University hospitals in the period from January 2008 to January 2010. Twenty four of them were presented by bilateral prominent (bat) ear and six of them were presented by unilateral prominent (bat) ear. The demographic distribution of this group was as follows: Twenty males and ten females, the ages ranged between 6 to 30 years (Mean 18 years). Patients were followed-up for a period ranging between 6 and 18 months. Pre and post operative measurement of the cephao-aurecular distance, Pre and post operative photography with frontal, back, right and left lateral views for all patients were done.

Surgical technique:

The operation is performed under general or local anesthesia. The face and ears are prepared with antiseptic solution and draped with both ears are exposed. Two skin traction sutures are applied to the auricle in superior and inferior thirds. Marking the proposed antihelx on the anterior surface of the auricle. Skin incision or excision in the presence of excess skin is centered over the postauricular groove which is "dumbbell" shaped with good hemostasis. A supraperichondrial dissection is performed on skin of the posterior surface of the ear to the outer border of the helical rim and inferiorly just behind the tail of the helix to allow access of the anterior surface of the ear (Fig. 1a). A multiple superficial abrasions of the anterior surface of the proposed antihelix by several gentle passes with a fine small rasp. Horizontal conchoscaphal mattress suture (4-0 or 5/0 proline suture on a cutting needle), at the proper distances from the apex of the new antihelical fold usually two to four separate sutures are required to secure the new antihelix not permanently tied (Fig. 2a). Once the desired antihelical fold is achieved, each suture is then permanently tied, from superior to inferior while observing the development of the antihelical fold. The ear positioned at approximately 15mm from the helical rim to the mastoid surface by two or three nonabsorbable concho-mastoid sutures. When a setback with sutures will be insufficient

to correct the ear prominence the choice of conchal reduction throw the posterior incision is done. Closure of Post-auricular skin by interrupted 4-0 proline suture (Fig. 3a). A single layer of vaseline gauze over the post-auricular suture line is applied. Then a cotton gauze dressing is wetted with antibiotic cream and carefully placed into the new antihelical folds and the concha (Fig. 4a) maintained by a roll gauze and light pressure crib bandage. This dressing is left in place for 7 days. Stitches removed after one week. The patient is then instructed to wear an ear protector (a tennis sweat band) each night for a month to prevent accidental stresses on the ear during sleep.

(A)

Fig. (1-A): A supraperichondrial dissection to allow access of the anterior surface of the ear.

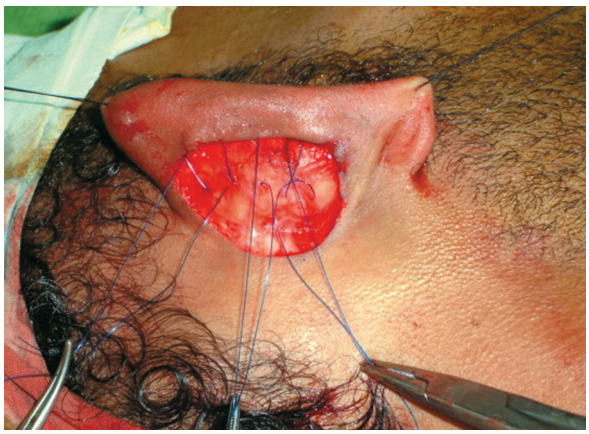

Fig. (2-A): Horizontal concho-scaphal suture (5/0 proline suture), to secure the new antihelix.

Fig. (3-A): Closure of Post-auricular skin by interrupted 4-0 proline suture.

Fig. (4-A): A single layer of Vaseline gauze over the post-auricular suture line and a cotton gauze dressing wetted with antibiotic cream and carefully placed into the new antihelical folds and the concha.

(B)

Female child six years old presented by bilateral prominent ears.

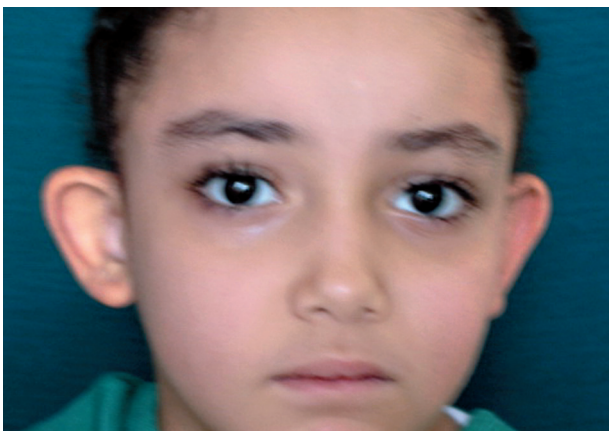

Fig. (1-B): Preoperative anterior view.

Fig. (2-B): Preoperative posterior view.

Fig. (3-B): Postoperative anterior view.

Fig. (4-B): Postoperative posterior view.

Fig. (5-B): Preoperative right lateral view.

Fig. (6-B): Preoperative left lateral view.

Fig. (7-B): Postoperative right lateral view.

Fig. (8-B): Postoperative left lateral view.

RESULTS

Satisfactory results were obtained in twenty six patients 86.6% by using this technique for correction of prominent ears and four complications occurred in four patients 13.3%, three cases of recurrence (one bilateral and two unilateral) and one case with wound infection managed by conservative dressing.

DISCUSSION

Correction of prominent ears is a common plastic surgical procedure. Proper execution of the surgical techniques is dependent on the surgeon's understanding of the surgical procedure **[4]**. Otoplasties are generally performed in children of 5-6 years of age under general anesthesia. Although, some authors recommend performing an otoplasty

in children younger than four years of age under general anesthesia, the necessary compliance and the auricular growth should also be taken into consideration when planning the time of the operation [5]. In this study the age of the patients ranged between 6 to 30 years. Most of plastic surgeons perform otoplasty on the patients who are aged 5 years or older but Gosain et al. [5] reported that otoplasty can be performed safely at age younger than 4 years without interfering with growth of the operated ear.

Multiple techniques including excision, bending, scoring or reposition of the auricular cartilage have been used for correction of prominent ear. The multitude of different approaches indicates that there is no single technique that can re-create the complex three dimensional nature of the normal human ear [6,7]. As in all cosmetic procedures proper patient selection is imperative [8]. The classic sculpturing techniques, probably introduced by Albert Cloutier of Montreal, take into consideration only abrasion of the anterior antihelix region [9]. Stenstrom, [10] using a basic plastic surgical principle described first by Gibson and Davis, [11] proposed a technique to establish the gentle fold of the natural antihelix through multiple superficial abrasions of the anterior surface of the auricular cartilage to create a new antihelical fold. Stenstrom and Heftner [12] applied this technique to both insufficient folding of the antihelix and excessive cupping of the concha.

In this study all cases of prominent ears are presented by lack of antihelix and/or conichal hypertrophy. In 1963, Mustardé [13] introduced his suture technique to create the new antihelical fold. This technique avoided the sharp visible margins that result from any of the techniques that incised or excised cartilage from the antihelical fold. In 1967, Kaye [14] combined the anterior scoring technique of Stenstrom with the posterior suture placement technique of Mustardé. This, the first of several composite techniques, involved the vertical curvilinear striations of the anterior perichondrium to weaken the cartilaginous "spring" followed by the creation and securing of the new antihelical fold by placement of posterior mattress sutures. Furnas, in 1968 [15], introduced the technique of correction of prominent ears by conchal-mastoid Sutures [16]. Incomplete Y-shaped cartilage strip was used for the formation of the antihelix without postauricular skin excision [17].

The described technique like that described by Hoehn and Ashruf [4] uses the cartilage-scraping maneuver to weaken the spring of the auricular cartilage, without any disruption between the helical rim and the antihelix, combined with Mustarde-type retention sutures to maintain the antihelical fold [18], plus concha-mastoid suturing [15] to achieve rotation of the concha cartilage in a posterior direction. Naumann [19] use a suturing technique described by Mustardé, in children up to the age of ten years, but in adults, he recommend a combination of incision, scoring and suture techniques. Burningham and Stucker [20] combined conchal cartilage resection and mattress suture technique with good long term results.

Leaving the scored antihelical fold unsecured will result in gradual flattening of the curvature, resulting in recurrence of the defect. Thus, permanent sutures should be placed. Cartilage scoring can be done via both anterior and posterior surfaces by different ways [17] but in this study a closed anterior scoring of the antihelix was done with a fine rasp these anterior scoring is comparable with the experimental observations of Gibson and Davis [11] who demonstrated that cartilage incised (scored) on one surface would bend away from the plane of the incisions.

In this study four complications occurred in four patients three cases of recurrence (one bilateral and two unilateral) require re-operation and one case with wound infection treated conservatively. A retrospective study by Tan [21] comparing the Mustarde with Stenstrom technique he concluded that 24% of patients treated by Mustarde technique required re-operation, whereas, 10% of patients treated by Stenstrom technique required re-operation. Benedict and Pirwitz [22] reported a revision surgery for a partial recurrence or a still insufficient correction of the deformity in 30 cases 9.9%. Gosain [5] observe a recurrence in one case of twelve patients.

In this study no reported cases of sinus or suture extrusion because the used prolene sutures are inverted over the cartilage. A review of 600 ears treated by Mustarde technique over 20 years had revealed six patients in whom sinus tracts to silk sutures developed and ten ears that required re-operation for residual deformity [23]. In principle, it can be differentiated between early and late complications of otoplasty [24-28]. Early complications include haematomas, wound infections, which may be associated with perichondritis, pain, post-operative bleeding, allergic reactions, and cartilage-skin necroses. In contrast, hypertrophic scars, keloids, suture material rejection with fistula formation, auricular deformities or a recurrence occur

as late complications. Since postoperative complications can often result in severe auricular deformities, as a matter of principle, each ear should be analyzed individually regarding its problem areas, and the surgical approach that causes the least injury to the cartilage should be used **[19]**. Hoehn and Ashruf **[4]** reported recurrence rate ranged from 1.8% to 3%. Most often it is caused by failure of a Mustardé postauricular suture or knot. In rare cases the suture may fatigue and break under stress, but more commonly the knot loosens and becomes untied. This problem usually requires re-operation to correct **[4]**.

Conclusions:

The composite technique is safe, effective, and easy with acceptable long term outcome and few complications. It can be considered a good surgical option for correction of the prominent ear, and is applicable to all presentations of the prominent ear. Leaving the scored antihelical fold unsecured will result in gradual flattening of the curvature, resulting in recurrence of the defect. Thus permanent sutures should be placed. Careful attention to the details of the operation for otoplasty will avoid many postoperative problems.

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