

The Outcome of Combined Conchal Excision, Concho-Scaphal Sutures and Concho-Mastoid Sutures Techniques for Treatment of Prominent Ears

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ABSTRACT:

BACKGROUND:

Prominent ear is one of the most common congenital deformities of the head and neck region. It can affect the aesthetics and psychosocial aspects of patients. There are over 170 techniques described in the literatures, but many do not adequately address the specific problem and can prove unstable. Technique selection in otoplasty should be done only after careful analysis of the abnormal anatomy responsible for the protruding ear deformity.

OBJECTIVE:

To evaluate the outcome of combined conchal excision, concho-scaphal sutures, and concho-mastoid sutures techniques for treatment of prominent ear.

PATIENTS AND METHOD:

A retrospective study was performed on 38 patients, from February 2009 to September 2014. All patients who had prominent ear were included in this study, except those who had constricted ear and secondary otoplasty. A combined method of conchal excision, concho-scaphal suture, and concho-mastoid suture technique was used for correction of prominent ear. The follow-up period was 6 –19 months (mean, 14 months). Data were entered and analyzed using the statistical package for social sciences SPSS version (18).

RESULTS:

In 38 patients who underwent otoplasty for prominent ear (24 were males and 14 were female), this technique of combined method used for all patients who had underdevelopment of antihelix and conchal hypertrophy. This technique allowed for correction of prominent ears to achieve a natural appearance. It achieved good to excellent symmetry in 95% of the patients and a low rate of complications. There were no major complication like skin necrosis or infection, but one patient develops small hematoma, another patient develops suture granuloma and extrusion and one patient had mild telephone deformity.

CONCLUSION:

This Technique is simple, versatile and applicable to all age groups, as well as its easy, safe and less recurrence rate with fewer complications and excellent long-term aesthetic outcomes.

KEYWORDS: prominent ear, otoplasty, conchal excision.

INTRODUCTION:

The term prominent ears refers to ears that, regardless of size, "stick out" enough to appear abnormal ⁽¹⁾. Prominent ears are the most common congenital deformity in the head and neck region, with an incidence described for Caucasians of but may be considered an aesthetic handicap and may be a source of psychological distress in both sexes and at any age ⁽²⁾. The forces governing the about 5 percent. Prominent ears are usually not associated with other abnormalities or syndromes

development of this deformity are unknown and only 8 percent of patients with this condition having some family history ⁽³⁾. It is inherited as an autosomal dominant trait ⁽⁴⁾.

The prominent ear is basically derived from a combination of defects in the antihelix and concha, which may include underdevelopment or absence of the antihelix, (increased conchoscaphal angle greater than 90°) and conchal hypertrophy or excessively deep concha, that causing an increased cephaloauricular distance to the poles (medium upper and/ or lower poles). Anteriorization of the ear lobule caused by hypertrophy of the helical tail also may occur. It is important to note that the shape to the curves of the ear is caused by the

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cartilaginous structure. The skin is merely the covering^(5,6).

Various treatments and techniques have been developed for the correction of these deformities, including methods that excise, bend, suture, scratch, or reposition the auricular cartilage. This wide variety of techniques suggests that no ideal method exists for the correction of protruding ears⁽⁵⁾.

Technique selection in otoplasty should be done only after careful analysis of the abnormal anatomy responsible for the protruding ear deformity⁽⁷⁾.

Otoplasty is a common cosmetic procedure performed to correct outstanding or protruding ears. The obvious goal of cosmetic surgery of prominent ears is to normalize the shape and position of both ears with maximal symmetry. Usually both ears have to undergo a surgical procedure, but sometimes a unilateral procedure is performed⁽⁸⁾.

The first attempt at correcting protruding ears was described by Dieffenbach in 1848 and consisted of a simple postauricular skin excision. In 1881, Ely removed a full-thickness strip of the auricle from the cephaloauricular angle; this left a visible scar in front of and behind the ear. Many authors have described similar techniques for correcting prominent ears, all depending on excision of skin and/or cartilage⁽⁹⁾.

In 1963, Mustarde used permanent retention mattress sutures in a combined technique with a fusiform skin excision to recreate the antihelical fold⁽¹⁰⁾.

In 1968, Furnas added concha–mastoid sutures to the Mustarde technique, thus resulting in a better set back in cases with excessive conchal height or cupping. In 1970, Wright described tangential shaving of conchal cartilage to help set back the auricle⁽¹¹⁾.

The aim of this study is to evaluate the outcome of combined conchal excision, concho-scapal sutures, and concho-mastoid suture techniques for treatment of prominent ears.

PATIENTS AND METHOD:

This retrospective study involved 38 patients, from February 2009 to September 2014. All patients who had prominent ears were included in this study. Exclusion criteria were constricted ear, secondary otoplasty and patients follow up less than six months. The follow-up period was 6–19 months (mean, 14 months).

Preoperative analysis of the auricular deformity done for each patient, focusing on the size and depth of the concha, the extent of development of

the antihelical fold, the extent of protrusion of the ear lobe, and quantitative evaluation of the degree of protrusion by measuring the mastoid helical distance at three levels, upper, middle and lower level of the ear.

Standard medical photographs have been taken for medical documentation pre and post-operatively. Informed consent was signed by all of the patients except in children for whom the consent was signed by their responsible adult person.

Surgical Technique:

All the patients operated under general anesthesia, prepping and draping are performed keeping both ears in the field for comparison. Measurements of both ears were taken and the more protruding ear was operated on first.

Marking of a small ellipse of postauricular skin was done accordingly (Fig. 1-A). The new antihelical fold outlined using a marking pen. The number and location of Mustarde conchoscaphal sutures (usually three or four sutures) were then marked along the line of the desired antihelical fold. Using a 23-gauge needle, the auricle was penetrated from an anterior to posterior direction at the line of the proposed antihelix. The needles were then tattooed with methylene blue and withdrawn; this tattoos both the posterior skin and the auricular cartilage. The ear is then infiltrated using a solution of 2% Lidocaine with 1:200,000 epinephrine.

Time is allowed for the vasoconstrictive effect of the infiltrative solution, then the previously marked ellipse of postauricular skin is excised and skin undermining is continued on the back of the auricle, stopping 8 mm short of the helical rim.

The formation of a new antihelical fold was created by using a row of horizontal mattress Mustarde sutures that was centered along the long axis of the root and superior crus of the antihelix (Fig. 1-B).

The suture is passed through the full thickness of cartilage including the anterior and posterior perichondrium but not the lateral skin. Each suture brought the cartilage of the scapha near to the concha. When tightened, they created or augmented the roll of the crest of the antihelix by drawing the scaphoid fossa towards the concha. The lowermost Mustarde suture was placed from the cauda helices to the concha, and the uppermost suture was from the concha to the triangular fossa. The anterior surface of the auricle is inspected while the suture is being tied and the amount of tension on the knot is adjusted according to the desired contour of the created antihelical fold. We usually tie the middle third sutures last to avoid any overcorrection of this segment, which may

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predispose to a telephone ear deformity. These sutures were performed with 4/0 polypropylene. The setback is started by excising an ellipse of conchal cartilage (2-3 mm width), then the edges of the conchal cartilage approximated with continuous running 5/0 polypropylene sutures (Fig. 1-C and D). Finally, Furnas concha-mastoid sutures (usually 2-3 sutures) are used to medialize and fix the auricle to the underlying mastoid periosteum (Fig. 1-E). At the completion of the procedure the postauricular incision is closed in a single layer of

interrupted vertical mattress suture using 4/0 polypropylene.

The second ear is corrected in a similar fashion, with the overriding goal being to achieve symmetry with the corrected side. Once symmetry has been achieved within 1-2 mm of each measurement, a light-pressure dressing is applied after splinting of the convolutions of the concha and antihelix with vaslinized gauze.

Data were entered and analyzed using the statistical package for social sciences SPSS version (18).

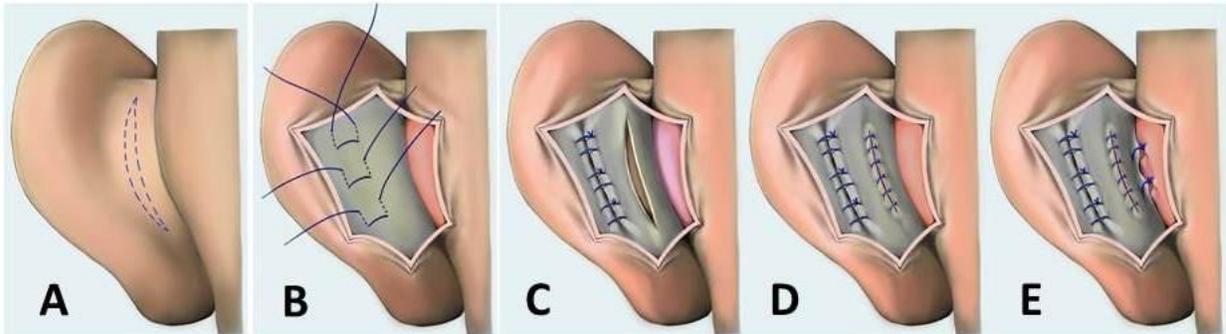


Figure (1). The steps of combined otoplasty. A- Marking an ellipse of skin. B- Mustardé mattress suture technique to create the antihelical fold. C- Excision of an ellipse of conchal cartilage. D- Suturing the cut edges of the cartilage. E- Conchal-mastoid sutures to decrease the concha-mastoid angle.

RESULTS:

This work included 38 patients presenting with prominent ear deformity (24 males, 14 females). The age of the patients ranged between 8-32 years with an average of 19.6 years. Thirty six patients presented with bilateral protruding ears, while 2 patients had a unilateral deformity, with a total number of 74 operated ears. Preoperative evaluation showed that all patients had antihelical

unfurling, while 66 ears (89%) had, in addition, an over projecting conchal bowl.

In all patients, the antihelical fold was recreated using a Mustardé mattress suture. Furnas concha-mastoid sutures and excision of an ellipse of conchal cartilage were used to achieve conchal setback and proper medialization of the ear in all patients with overdeveloping conchal bowl (Fig. 2, 3).



Figure (2). (A,B,C) pre-operative (frontal, lateral and posterior) view of 26 years old patient who had bilateral prominent ears consisting of lack of antihelix and conchal hypertrophy. (D,E,F) post-operative view of the same patient 13 months later.

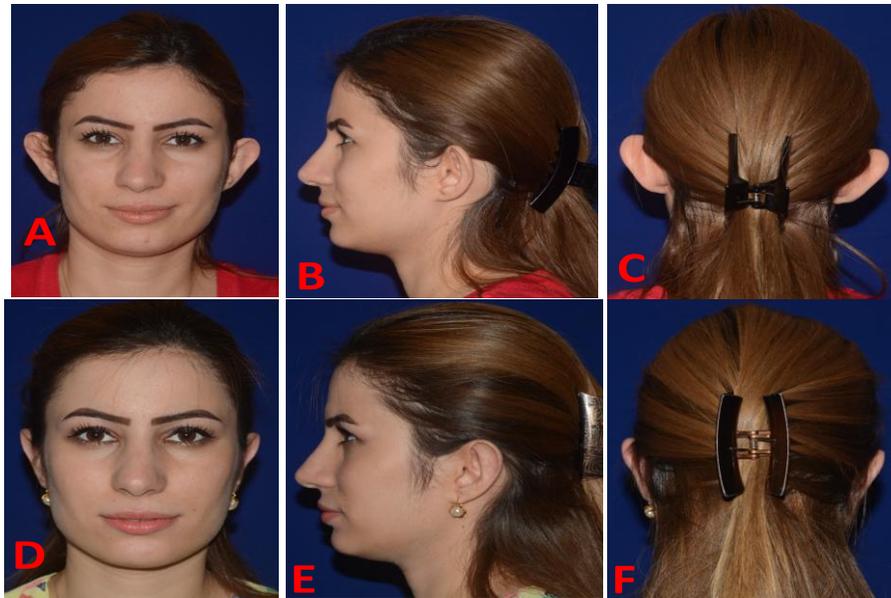


Figure (3). (A,B,C) pre-operative (frontal, lateral and posterior) view of 22 years old patient who had bilateral prominent ears consisting of lack of antihelix and conchal hypertrophy. (D,E,F) post-operative view of the same patient 9 months later.

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Ear-to-ear symmetry was assessed by comparing measures between both sides. Symmetry was rated excellent when no more than a 2-mm difference existed at any of the three recorded levels, good when less than a 4-mm difference was present and poor when more than a 4-mm difference existed at any of the three levels recorded.

Postoperatively, 28 patients (73.6%) showed excellent symmetry (Figs. 4 and 5), 8 patients (21%) good symmetry, and 2 patients (5.2%) poor symmetry.



Figure (3). (A,B,C) pre-operative (frontal, lateral and posterior) view of 29 years old patient who had bilateral prominent ears consisting of lack of antihelix and conchal hypertrophy. (D,E,F) post-operative view of the same patient 10 months later, showing excellent symmetry.



Figure (4). (A,B,C) pre-operative (frontal, lateral and posterior) view of 23 years old patient who had bilateral asymmetrical prominent ears. (D,E,F) post-operative view of the same patient 12 months later, showing excellent symmetry.

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The overall complication rate was 13.1% (5 patients). Complications encountered included minimal low-flow bleeding for 1 day despite pressure head wrap and bandages in two ears of two patients (5.2%), suture granuloma and extrusion in one patient with concha-mastoid

sutures that occurred 4 months postoperatively, slight telephone deformity in one patient, and small hematoma in another patient, that was treated with simple drainage and continuation of the mastoid wrap for 3 days (table 1).

Table 1: The complication rate in this study.

Complications	Number	Percentage
Low flow bleeding	2	5.2%
Suture granuloma	1	2.6%
Hematoma	1	2.6%
Telephone deformity	1	2.6%
Total	5	13.15%

The shortest duration of follow-up in our cases was 6 months, and the longest was 19 months. No case of relapsed prominent ear was observed during the postoperative follow-up visits.

DISCUSSION:

The main goal of any otoplasty is to obtain a natural appearing symmetrical auricle. The surgical techniques used for the correction of the protruding ear are dependent on the preoperative analysis; whether it is due to an antihelical deformity, conchal protrusion, or both ⁽⁷⁾.

Although there are various surgical techniques described for the correction of protruding ears, there is still no single versatile technique that can be adopted for all cases ⁽⁹⁾. Technique selection should be done only after careful analysis of the abnormal anatomy responsible for the auricular deformity. In the current study the main underlying factors for the protruding ear deformity were found to be unfurling of the antihelix, which was present in all patients, and an over projecting concha, which was found in 89% of the patients.

The surgical approach in our study has been based on a surgical technique that combines conchal excision, concho-scapal sutures, and concho-mastoid suture to address all the factors contributing to the deformity of prominent ears.

The suturing techniques of Mustarde and Furnas offer the advantage of being technically simple and easily reversible, with no permanent damage to the auricle. In most of the cases with soft cartilage the suturing techniques allowed us to control the shape of the desired antihelical fold and degree of medialization of the ear by simply changing the number, position, and amount of tension on the sutures used. However, in those patients with

conchal hypertrophy 89% of the patients, adequate medialization was not possible to achieve using the suturing techniques alone and a full-thickness excision of an ellipse of conchal cartilage was necessary ⁽⁹⁾.

The elastic properties of auricular cartilage are normally age dependent. Before the age of 6 years, the cartilage is malleable, and correction with the suture technique can be maintained with a low recurrence rate. However, complete relapses have been reported, more often among adolescents and adults in whom the auricular cartilage is stiffer and less pliable, which is a limiting factor for this type of technique. However, sculpting techniques permanently alter the structure of the auricular cartilage ^(12,13).

Review of some articles demonstrating long-term results of cartilage-sparing and suture techniques reported an average loss of correction at the upper level of 30–59% ^(14,15). In this study we didn't notice any loss of correction during the follow up period, due to the fact that we did not depend exclusively on sutures techniques, but we combined these techniques, with excision of conchal cartilage.

In this study, the overall complication rate was 13% (5 patients). Suture granuloma and extrusion occurred in one patient with concha-mastoid sutures 4 months postoperatively. The suture was removed and it did not affect the degree of conchal setback, as the remaining sutures and the developed fibrosis were enough to hold the ear in the corrected position.

Suture granuloma and extrusion are not uncommon following suture procedures for otoplasty and may occur at any time in the postoperative period. It

may result from incorrect suture placement, from excess tension on the auricular cartilage, or from infection. Early suture extrusion may require revision surgery to restore the correction^(14, 16).

In our study, suture granuloma and extrusion occurred in one patient (2.6%), comparing this result with other studies, they found that Mustarde sutures are more liable to granuloma formation and extrusion^(14,16), since we only used polypropylene (monofilament suture) for the Mustarde stitches, compared to other braided suture materials, which cause more tissue reaction. Additionally, the postauricular skin incision was kept in a more medial plane than that of Mustarde sutures to avoid their overlap, which might facilitate suture extrusion⁽⁹⁾.

One patient had a slight telephone deformity. In this patient, conchal cartilage excision was performed and resulted in slight overcorrection at the middle level with the resultant deformity.

It is very important that the ear does not have a “telephone deformity” at the end of the procedure. If this is the case, either the upper pole of the ear or the lobule or both need to be moved closer to the temporal scalp. Tanzer stated that it is desirable to be able to see the helix as the most lateral structure along the whole cartilaginous part of the ear⁽¹⁷⁾.

The great advantage of the current technique is that it allows the surgeon to have a more delicate approach and correct the affected structures of prominent ears. Moreover, the aesthetic improvement becomes evident even in the immediate postoperative period.

CONCLUSION AND RECOMMENDATION:

The combined conchal excision, concho-scapal sutures, and concho-mastoid suture techniques is a safe, easy and effective procedure for treatment of prominent ears. It resulted in a better aesthetic outcomes with less recurrence rate and either early or late complications and there is no need for over correction because there is less relapse as may happen after Mustarde and Furnas sutures without cartilage excision. This procedure can be used as a standard technique for all kind of prominent ears, despite any differences in age and/ or magnitude of defect of the patients.

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