

Do combined otoplasty techniques really improve the surgical outcomes for prominent ear correction in adult patients?



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Do combined otoplasty techniques really improve the surgical outcomes for prominent ear correction in adult patients?

OBJECTIVE: *Prominent Ear is a genetic malformation of the human ear. It occurs due to malformation of cartilage during primitive ear development in intrauterine life. Multiple surgical techniques for the correction of protruding ears have been described which include: incisions, sutures, and cartilage scoring, isolated or in combination. To date, no ideal method that fulfills the aim of a complete surgical resolution has been described in adult patients. The aim of our study is to discuss the main surgical technique described in order to identify technical association to obtain optimal surgical outcome with minimal surgical morbidity.*

MATERIALS AND METHODS: *We've carried out a retrospective chart review of 74 patients suffering from protruding ears. Our cohort was divided in two groups based on the otoplasty technique performed, Mustarde (Group A) versus Chongchet + Furnas (Group B).*

RESULTS: *With the exception of wound infections and hematomas, which have a similar incidence, the morbidity rate was higher in Group A patients.*

CONCLUSIONS: *Both surgical approaches are effective for prominent ear correction but our combined technical procedure has advantages over patient satisfaction and recurrence rates.*

KEY WORDS: Combined technique, Otoplasty technique, Otoplasty in adult, Prominent ear deformity

Introduction

Prominent ear is the most common congenital ear malformation. About 5% of the Caucasian population are affected¹. Pathogenesis include genetic factors, environmental influence and consumption of drugs during pregnancy². This malformation is considered as one of

the major aesthetic handicaps which may negatively affect a child's psychology, primarily when the child starts school^{3,4}.

Protruding ears is characterized by one or more abnormalities: absence of a normal antihelix, presence of a wide and deep concha, inappropriate helical edge definition and lobule alterations⁵. There are a number of otoplasty techniques currently used for the prominent ear correction.

The first author to describe a surgical technique to correct prominent ear deformity was Dieffenbach⁶ in 1845. Later, Mustarde⁷, Pitanguy⁸, Chonghet⁹, and Furnas¹⁰; including many others proposed their surgical technique. Reports in literature on complication rates and long-term results have been few. Complications can be divided into early and late sequelae, respectively before

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and after the fourteenth post-operative day ¹¹. The early complications include hematoma, bleeding, skin necrosis, wound dehiscence, and wound infection. Late complications include suture extrusion, hypersensitivity, hypertrophic or keloid scarring, asymmetry, unsatisfactory aesthetic results. Nowadays, among the techniques described in literature a high rate of postoperative complications is reported ¹²⁻¹⁵ Momo et al reported low rates of complications when combined techniques were performed ¹⁶. The aim of our study is to analyze the main surgical technique described in order to identify the best technical association to obtain optimal surgical results with low morbidity in adult patients.

Materials and Methods

We carried out a retrospective chart review of 74 patients suffering from protruding ears, admitted to our institution between April 2008 and April 2014. Upon inclusion, Patients had to meet the following criteria:

1. Diagnosis of protruding ears;
2. Patients >18 years;
3. Patients operated on for the first time;
4. Patients operated by the same surgical equipment

Our cohort was divided into two groups:

- GROUP A - 37 patients treated by Mustarde technique;
- Group B - 37 patients operated with our combined technique (Chongchet + Furnas).

Patients had a follow-up after 24 months and maximum of 96 months post-operation; the average patient was seen 60 months post-operation. One month after surgery each patient was administered a questionnaire to measure

the degree of postoperative satisfaction on a visual analogue scale from 1 to 10. Values from 1 to 3 showed a poor result, from 4 to 7 a satisfactory result and from 8 to 10 a good result. Statistical calculations were performed with the Statistical Package for Social Sciences (version 17.0; SPSS, Chicago, IL). The difference between groups regarding evaluated recurrence rate and complications was measured with a χ^2 test. The level of statistical significance was $P < 0.05$.

OUR TECHNIQUE

Once the patient is intubated, we carry out anaesthetic infiltration on the posterior side of the ear pavilion using 2% mepivacaine with adrenaline. A prophylactic antibiotic protocol is used, which includes a dose of cefazolin 30min prior to surgery and a second dose 4-6h after surgery.

Cutaneous excision is performed using a posterior approach, in a spindle shape. We form the antihelix fold by holding the pavilion with the fingers in an anterior position. Meanwhile, the posterior side should show the prominences formed by the cartilage located between the helix and the antihelix, as well as that between the antihelix and the chocha, which should be sutured. In this way, we can easily determine the location of the points where the stitches are to be placed; this avoids the use of needles that pierce the cartilage and consequently avoids trauma to it (Fig. 2).

A sterile marker should be used to mark the 4 points through which the suture will pass to create a "U" suture. This should be done with non-absorbable material. In our series, we used Gore Tex® thread or nylon suture. We start at the top of the pavilion, then descend and take 2 or 3 stitches as necessary.

The needle must pass through the width of the cartilage without penetrating to the anterior side. Once both prominences have been sutured, we gradually tighten it until the fold acquires the desired shape. Next, we suture downwards, adding 1 or 2 more as needed (Figs. 3-5).



Fig. 1: Cartilage incision from the superior antihelical crus to the tail of the neo antihelix.



Fig. 2: Skin detaching from the cartilage on the anterior aspect of the ear.



Fig. 3: Reconstructed antihelix stabilized through two/three 4/0 white Vycryl rolling stitches to hold the antihelical fold.



Fig. 4: Cartilage scoring with parallel and crosshatched cuts.

We applied the Chongchet⁹ + Fumas technique¹⁰ to our patients. This approach provides the incision of the cartilage from the superior antihelical crus to the tail of the future antihelix (Fig. 1). Subsequently, the skin was carefully detached from the cartilage on the anterior aspect of the ear, and the incision was prolonged in a concha direction to elevate a cartilage flap (Fig. 2).

Reconstructed antihelix was stabilized using two/three 4/0 white Vycryl rolling stitches to hold the neo-antihelical fold (Fig. 3).

Stitch knots have been placed into the rolled cartilage flap. Two stitches were usually enough for a small ear (e.g. a female ear) and three were required for a bigger ear or for dense cartilages. The stitches were positioned in the upper and lower parts of the neo-antihelix, if necessary a third stitch was placed in the middle¹⁰. Then the anterior surface of this flap was scored with parallel and crosshatched cuts (Fig. 4). This maneuver weakens the ear cartilage, to decrease the tension due to the curves.

Results

A total of 74 patients were enrolled onto this study, 33 males and 41 females; aged between 18 and 46, with a mean age of 25.

TABLE I - Complication rate comparing the two study groups

Complications	Group A (37)	Group B (37)	P-Value
Hematoma	1 (2,7 %)	1 (2,7 %)	> 0,5
Wound infection	2 (5,4 %)	1 (2,7 %)	> 0,5
Recurrence	3 (8,1 %)	0 (0,0%)	< 0,5
Protruding lobule	4 (10,8 %)	0 (0,0%)	< 0,5
Scarring	2 (5,4 %)	0 (0,0%)	> 0,5

In Group A, we found 1 case of hematoma (2.7%), 2 cases of wound infections (5.4%), 3 cases of recurrence (8.1%), 4 cases of protruding lobule (10.8%) and 2 cases of scarring (5.4%). In Group B, there were no cases of recurrence, protruding lobule and scarring. We encountered 1 case of hematoma (2.7%) and 1 case of wound infection (2.7%) 17-20. The analysis of postoperative questionnaires showed that 21 of 37 (56,7%) patients treated with Mustarde technique (Group A) achieved a good result, 10 patients (27%) had a satisfactory result and 6 patients (16.2%) reported a poor result. 28 patients (75.6%) in Group B reported a good result and 9 patients (24.32%) reported a satisfactory result (Table I) shows a comparison of the results of the %2 test for the first and the second group.

Except for wound infections and hematomas, the complication rate was higher in Group A patients.

Recurrence was 16.2% in Group A and 0% in Group B [P<0.05]. Protruding lobule was significantly more frequent in Group A (27%) than in Group B (0%)[P<0.05].

The presence of scarring was insignificantly more frequent in Group A [P>0.05].

Discussion

The prominent ear deformity is a very common malformation. This type of deformity causes frequent psychological disorders in children with surgical correction being the only method of addressing it. The main purpose of this surgery is to create symmetrical and natural ears, with minimal scarring and to avoid possible recurrence of the pathology.

Surgical resolution of prominent ears can be accomplished by numerous techniques. The first author who described a surgical technique to correct a post-traumatic prominent auricle was Dieffenbach in 18456. The Author used a concho-mastoidal suture for the fixation of the ear. In 1963 Mustarde described an otoplasty technique which is appropriate to create an antihelical fold in children⁷. Despite its advantages, the Mustarde's technique results is primarily suitable for soft and thin cartilage, which is generally present in children up to the age of 10 years. In recent years other more aggressive techniques were developed. Converse et

al. 12 described a technique which weakens the cartilage by abrasion through milling. Chongchet⁹ et al. described the use of multiple cartilage incisions to facilitate the antihelical folding. Pitanguy⁸ et al. proposed an incision-suturing technique, in which an excised cartilage island defines the new antihelical prominence.

In 1968, Furnas¹⁰ et al. introduced a method in which retroauricular soft tissues, including posterior auricular muscle and ligament, were resected and attached by conchomastoid sutures.

The purpose of all these techniques is to create a neo-antihelical fold, reduce the concha and the scaphomastoid angle. Using the Mustarde's technique in 127 patients, Aguilar et al.¹³ reported a recurrence rate of 4.72%. Schlegel-Wagner et al.¹⁴ designed a retrospective study of 420 patients who carried out otoplasty with a technique including anterior weakening of the cartilage combined with post-auricular fixation sutures. The satisfaction rate was 91%, they found a partial recurrence in the 8.6% of cases and a complete recurrence in the 2.3%. Mandal et al.¹⁵ compared 3 otoplasty techniques (Group A, anterior cartilage weakening technique; Group B, cartilage-conserving technique; and Group C, cartilage sutures with posterior facial reinforcement technique) in 203 patients. They found a lowest rate of complications in the group C with optimal cosmetic results, in our study we compared two groups of patients treated with Mustarde's technique or treated with our combined technique (Furnas + Chongchet). In our series we modified the classical Chongchet technique making cross-hatched cuts to obtain a good antihelix curve. Using this method we have achieved a significant weakening of the cartilage to design a more natural and harmonious curve.

There was a significant difference between our technique and Mustarde's technique regarding recurrence and protruding lobule ($P < 0.05$). There was no significant difference in the 2 groups with regards to wound infection, hematoma and presence of scarring. According to Schwentner³ et al. the technique proposed by Mustarde offers better results for children in which cartilage was more easily corrected due to their thinness and texture. In adults patients, the increase in cartilage thickness and the increase in rigid component make the maintenance of the corrective results more difficult over time using the Mustarde technique alone.

Conclusion

To conclude, we can state that both techniques are effective for prominent ears correction in adult patients however our combined technical procedure has advantages over patient satisfaction and recurrence rates. According to our encouraging findings, further studies on a larger clinical series are required to assert our results.

Riassunto

In letteratura sono state descritte diverse tecniche di correzione delle orecchie ad ansa, incluse differenti tipologie di incisione, suture o plastica delle cartilagini auricolari. Non è stata, tuttavia, descritta una procedura chirurgica che potesse essere considerata univoca e ideale nella popolazione adulta: lo scopo del presente lavoro e quello di analizzare le tecniche di otoplastica descritte al fine di individuare la metodica associata a risultati migliori e ad una incidenza minore di complicanze.

Sono stati analizzati 74 pazienti affetti da orecchie ad ansa: un primo gruppo della coorte studiata è stato sottoposto ad otoplastica secondo Mustarde, un secondo gruppo ad otoplastica secondo Chongchet + Furnas. Entrambe le tecniche hanno mostrato risultati estetici soddisfacenti e paragonabili; la nostra tecnica combinata (secondo gruppo) ha mostrato tuttavia un'incidenza di complicanze complessivamente minore.

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