Aesthetic Otoplasty With Remodeling of the Antihelix for the Correction of the Prominent Ear

Criteria and Personal Technique

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A brief account of some important aspects of the embryological formation of the external ear is presented. Family and patient motivations to correct the aesthetic aspect of the prominent ear caused by the lack of development of the antihelix are discussed. The criteria for the selection of the patients and the ideal age for the surgical procedure are analyzed. The objectives of otoplasty for the correction of this deformity and the personal technique of the author are described. Emphasis is placed on the author’s original contributions to this procedure and the results. The possible postoperative complications are discussed.

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There are many types of malformations of the auricle. In this article, I will refer only to prominent ears, and only to those caused by the lack of formation of the antihelix. The surgeon must be able to distinguish between a prominent ear that is caused by the lack of formation of the antihelix and one that is caused by an excessively large auricular concha. Both types of malformation lead to an excessively large auriculomastoid angle and present the typical appearance of the lop-ear, or the prominent ear.

Lack of formation of the antihelix between the 12th and the 16th week of embryonic life is a congenital hereditary autosomal recessive malformation that results in a typical characteristic facial appearance that is apparent from a very early age. Patients with this malformation are frequently the object of nicknames that become a form of degrading stigma, which, in turn, may cause loss of self-esteem, especially during childhood. Early in life, the patients and their families become aware of the morphological disorder and its psychosocial consequences.1 The correction of this malformation is not exclusively cosmetic; it may also prevent psychosocial repercussions. Thus, it should be regarded as a procedure with both aesthetic and functional purposes.

Surgery is best performed when the patient is older than 6 years, when the cartilage has reached adequate consistency and maturity. Adults may have less flexibility of the auricular cartilage, as well as some degree of calcification, which will render it brittle and make the operation more difficult. Once the patient’s family, the patient, and the surgeon have all decided to proceed with the corrective operation, the following considerations should be kept in mind:

1. Postoperative care is as important as the surgical procedure, especially in young patients. The following case illustrates this point. A 5-year-old boy with moderate mental retardation underwent an otoplasty with remodeling of the antihelix. On postoperative day 3, after the retroauricular stitches were removed, the patient literally pulled his ears off in an attempt to put his head through a T-shirt by himself without his mother’s help. He had to undergo a second operation; fortunately, the result was good.

2. There is always the possibility that a hypertrophic or keloid scar will develop in the retroauricular region, which is a very susceptible area for this complication.2 4 I treated 4 patients in whom this type of scar, which can be severe enough to alter the position of the ears, developed. The signature of a good surgeon is an adequate scar. The scarring process differs greatly in different patients.

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Pathologic scarring usually takes place gradually in the first 2 to 6 months after surgery. It is within this period that adequate treatment can be given. Therefore, I recommend careful follow-up of the patient so that if there is hypertrophic scarring, it can be identified early.

The auricle is a complex structure of fibroelastic cartilage without subdermal connective tissue. The anteriorly overlying skin is very thin, and it is firmly attached to the periosteum; the skin at the posterior aspect is thicker, and it lies on a thin layer of connective tissue. The auricle exhibits several prominences, grooves, and folds. As surgeons, we are committed to the creation of a new auricle that is as similar to a normal one as possible. In unilateral cases, the challenge may be greater, since the goal is to try to imitate as perfectly as possible the normal side, both in size and in the auriculomastoid angle, as well as the prominences, grooves, and folds. With this goal in mind, facial surgeons who perform otoplasties with remodeling of the antihelix must try their best to achieve (1) symmetry; (2) an adequate auriculomastoid separation (≥12 mm from the surface of the mastoid process to the lateral border of the helix); (3) anatomical remodeling of the antihelix without acute angles or edges; (4) invisible scars; (5) lasting results; (6) preservation of the retroauricular groove; and (7) a tension-free antihelix, using the least amount of suturing material possible.

During my practice, I have used different surgical techniques for the correction of the prominent ear, such as those of Tanzer, Converse and Wood-Smith, Farrar, and Mustarde, but none of them offers consistent results according to the criteria outlined above. For the last 7 years, I have worked in the largest pediatric hospital in Mexico, the Instituto Nacional de Pediatría, in Mexico City, and in private practice, Tlalpan, Mexico. With the goal of obtaining the best results possible, I have systematically used the following technique in more than 50 cases (involving more than 100 auricles).

**OTOPLASTY WITH REMODELING OF THE ANTIHELIX**

With the pediatric patient under general anesthesia and the adult patient under local anesthesia, the technique begins with bilateral measurement of the auriculomastoid separation. In both unilateral and bilateral cases, the measurement must be done on both sides, since in unilateral cases the challenge is to obtain a separation of the helix from the mastoid process that is no greater than 12 mm. I have found that when the separation is less than 12 mm, the end result is not aesthetically acceptable; indeed, the auriculomastoid groove is lost or hidden, which makes it quite obvious that a surgical procedure has been performed, resulting in an unaesthetic and unnatural appearance.

The site of the future antihelix is marked with the transfixion placement of a hypodermic needle whose tip has been immersed in methylene blue, causing a temporary tattoo both in the anterior surface of the auricle and in the cartilage and its posterior aspect. The marks should be located 4 or 5 mm behind the entire length of the future position of the maximal prominence of the antihelix (Figure 1). Precise location of the marks is of the utmost importance, as it is the only way to tattoo the cartilage in its 2 aspects, anterior and posterior, so that the anatomical relationships are not lost during dissection; it is then safe to make the incision of the cartilage at its posterior aspect at the exact location previously planned.

Subsequently, 1% xylocaine with epinephrine (3 mg/kg) is injected subperichondrially in both aspects of the auricle. A lozenge-shaped incision is then made in the posterior aspect, and the skin is resected; the resection must not include too much subdermal tissue, since the natural formation of the antihelix depends, in great measure, on this step. Then a transfixion incision is made in the posterior aspect of the auricular cartilage at the precise site where the provisional tattoo was placed (Figure 2). The next step is a subperichondrial dissection in the anterior aspect of the auricular cartilage (Figure 3).

This dissection must be done upward to the site of union of the new antihelix and the helix to permit the natural formation of the fossa triangularis and downward to the site where the formation of the antitragus begins, anterior to the site of the union of the new antihelix and the auricular concha. The next step is to make multiple and multidirectional hemitransfixion incisions on the anterior aspect of the auricular cartilage at the exact point where the new antihelix will be formed (Figure 4). All the above steps result in a natural roll-
ing of the cartilage, creating a prominence to give the impression of a new antihelix and to accomplish the diminution of the auriculomastoid separation.

It is important to recognize that the formation of the antihelix requires (1) the conservation of the connective tissue of the posterior aspect of the auricle and the perichondrium that is attached to the posterior aspect; (2) the subperichondrial dissection of the anterior aspect of the auricular cartilage; and (3) multiple and multidirectional hemitransfixion incisions. The final step is the placing of 2 nylon sutures in the connective tissue and the perichondrium of the posterior aspect of the auricular cartilage to ensure the permanence of the rolling, which guarantees the formation of a new antihelix that is free of tension. A perfect hemostasis with a bipolar cautery is mandatory to avoid the accidental production of thermal skin lesions that could cause scar formations and damage the results. The surgical wound should be closed with interrupted nylon everting stitches to diminish the risk of an abnormal scar. The cosmetic result is then assessed in terms of symmetry and auriculomastoid angulation. A fragment of malleable porous polyester splint (Aquaplast; WFR/Aquaplast Corp, Wyckoff, NJ) is applied on the anterior aspect of the cartilage to enhance its rolling and the neoformation of the antihelix. Notice the resection of the posterior skin of the ear and the provisional tattoo in the cartilage made with the transfixion maneuver of the hypodermic needle. The tattoo marks the reference points that will ensure achievement of the preoperative plan. However, we recommend waiting 8 months, until the scar formation is finished, for final evaluation.

COMPLICATIONS

Despite a careful operation and the generally good results, a small percentage of patients suffer minor complications. In my experience, hypertrophic bilateral scars developed in only 4 cases, for an incidence of 8% in more than 100 otoplasties. They have improved with the application of a Silastic gel and local injections of triamcinolone. Good results have been obtained in every case, with an adequate retroauricular scar.

One of my patients showed a moderate postoperative asymmetry, which was corrected with the same surgical approach, during which 2 more retroauricular nylon sutures were placed to reinforce the rolling of the cartilage. In no case has there been significant postoperative pain, perichondritis, infections, hemorrhage, necrosis of the anterior skin, or notable residual deformity, all of which are mentioned in the literature.9

Interest in the appearance of the auricles in the context of facial aesthetics began in 1881 with the contributions of Ely.10 Numerous publications have appeared since then proposing various techniques to correct this physical disorder, many of which are excellent. It would be difficult to offer a truly new technique for otoplasty; most “new techniques” would be no more than slight modifications of well-known procedures. The technique herein described is a personal modification of other techniques.

I have had experience with many types of procedures, and the one described herein seems the easiest and most logical in terms of the natural formation of the antihelix. It does not cause any tension on the new antihelix; it is easy to reproduce; and the objectives are easier to attain (Figure 5).

I have used a No. 15 blade for many years for multiple and multidirectional hemitransfixion incisions on the anterior aspect of the cartilage. I have also used diamond-tipped bits in an attempt to shave part of the cartilaginous thickness in order to weaken it and to enhance its rolling. However, I am convinced that the best instrument for this is the multiple-blade knife, which permits better control of the depth of the multiple and multidirectional hemitransfixion incisions as well as of the symmetry and separation of the incisions. It shortens

Figure 3. The dissected cartilage in its anterior aspect is shown; it is attached to the subcutaneous tissue and the perichondrium in its posterior aspect.

Figure 4. Multiple and multidirectional hemitransfixion incisions are made on the anterior aspect of the cartilage to enhance its rolling and the neoformation of the antihelix. Notice the resection of the posterior skin of the ear and the provisional tattoo in the cartilage made with the transfixion maneuver of the hypodermic needle. The tattoo marks the reference points that will ensure achievement of the preoperative plan.
Figure 5. Preoperative (A, C, E, G, and I) and postoperative (B, D, F, H, and J) views of a 6-year-old boy whose antihelixes were remodeled. This case illustrates the immediate results obtained by remodeling the antihelix, with practically no edema. Note the great asymmetry of both ears in the preoperative views. The postoperative posterior view (F) shows the preservation of the auriculomastoid groove. There is very mild postoperative edema (H and J), but the natural formation of the antihelix is apparent without any transfixion sutures.
surgical time and may be used in other procedures, such as harvesting hair grafts, the procedure for which this device was originally designed.

The porous polyester splint becomes highly malleable when it is put in contact with water heated at 71°C; then, when cold water is applied, it retains the desired shape. The use of this material has been based on the work of Biedenbach and Steehler,11 who suggested its application for the treatment of wrestler’s ears. In their experience, and mine, this material has never caused thermal damage to the auricular skin.

CONCLUSIONS

Good results in aesthetic otoplasty in cases that lack formation of the antihelix depend on the selection of a surgical technique based on the neoformation of a tension-free antihelix. The technique described herein avoids tension and postoperative pain, and renders aesthetically adequate results in most cases. Using a multiblade to make the multiple and multidirectional hemitransfixion incisions on the anterior aspect of the auricular cartilage, as well as adequate compression, is also very helpful.

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REFERENCES


Quotable

A patient who comes to a surgeon for rhinoplasty should have the attitude of a Tuscany shopper for fagoli, the beans used in their famous soup. It is to be expected that they will receive a few grams more or a few grams less than the requested kilogram. Those willing to accept only the exact amount should see the surgeon only socially—perhaps at Christmas.

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