The Anterior-Posterior Otoplasty

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Objective: To introduce a simple, modified method for correcting prominauris.

Design: Case series.

Setting: Private, facial plastic surgery practice. All operations were performed in an office surgical suite on the campus of a university medical center.

Patients: Fourteen patients (7 women and 7 men; age range, 22-46 years), constituting 28 ears, underwent otoplasty between February 1995 and November 1997. Follow-up ranged from 7 to 26 months (average, 11.5 months).

Intervention: Anterior-posterior otoplasty was performed.

Outcome Measures: Subjective analysis by the author and patients, guided by photograph and chart review.

Results: Four ears had solely helical correction, while 22 ears had combined helical and conchal corrections. Within a few degrees, the desired posterior rotation occurred in all cases. Minor, persistent asymmetry, in auricle rotation or retrusion of either helical or conchal correction, was evident in 4 cases.

Conclusion: Anterior-posterior otoplasty is a predictable, safe method for surgically retracting ears.


While the earliest otoplasty procedures successfully produced some reduction in the auriculocephalic angle, later variations improved on the extent and control of auricle repositioning. Still, a host of residual natural or iatrogenic deformities, such as asymmetry, cartilage edges or spikes, lateral warping, persistent or increased loping, keloid formation, postauricular scarring, prominent lobules, helical creasing, incomplete medialization, conchal contraction, and posterior sulcus obliteration, may leave the patient embarrassed about his or her ear shape and position.

Prominauris is designated by different features, according to the many investigators who have studied this problem. Elliot considered a distance greater than 2.0 cm from mastoid to helix at midauricle to be abnormal. The normal auriculomastoid angle is often estimated at about 30°, and, at the level of the upper insertion point of the ear, Davis defined protrusion over 40° as beyond the 95th percentile.

Otoplasty for prominauris has 2 principal technical components, the helical and conchal corrections, for which both anterior and posterior approaches have been preferred by different surgeons over the past century. This report describes the anterior-posterior otoplasty, a combination technique for auricular retraction and rotation based on earlier procedures that allows graded control of helical and conchal angulation by the application of mattress sutures across areas of weakened or excised cartilage.

RESULTS

Fourteen patients (7 men and 7 women; age range, 22-46 years) underwent elective, primary otoplasty for prominauris over a 32-month period, from February 1995 to November 1997, totaling 28 ears, 2 of which had a bilateral helical correction only. Follow-up, ranging from 7 to 26 months and averaging 11.5 months, revealed that the desired degree of rotation was generally matched in all cases (Figure 3 and Figure 4). Imme-
PATIENTS AND METHODS

Preoperative patient consultations to identify appropriate candidates were performed by the author. Most patients requested either a simple helical or a combined conchal-helical deflection, and each result was demonstrated so that they could choose accordingly. Any absolute limitation resulting from mastoid or temporal bone prominence was determined.

In all prominaiurs subjects, the superior crus of the antihelix was absent, creating outward cupping superiority. Flattening of the conchal bowl, resulting in widening of the conchal-mastoid angle, was more variable. Patients with extreme overfold along the lateral helical rim that was not corrected by creating a superior crus were advised about this limitation. They were also told that their earlobes might require additional retrusion procedures.10

Appropriate physical examination, medical evaluation, consent, and photography were completed before surgery; a detailed discussion of the risks, potential complications, and alternative procedures was included. Postoperative patient consultations, including chart and photography review, were performed periodically by the author.

All procedures were performed with the patient under local anesthetic, without sedation or general anesthesia. The ear was prepared and draped steriley with 10% povidone-iodine and injected with 20 mL of 1% lidocaine with 1:100 000 epinephrine mixed in a 1:10 solution of 8.4% sodium bicarbonate and a 1:25 solution of hyaluronidase (Wydase), 150 U/mL.

Conchal surgery was performed before helical surgery to eliminate the risk of sutures tearing through the cartilage from auricular manipulation. The areas of intended cartilage removal within the bowl (Figure 1, A), postauricular undermining, and potential sites of mastoid-conchal sutures were marked with gentian violet (Figure 1, B).

A vertical, postauricular incision, limited to the length of the conchal bowl and located approximately 1 cm lateral to the postauricular sulcus, was completed through the skin, subcutaneous attachments, and underlying perichondrium (Figure 1, B). After the perichondrium was peeled off the area of intended cartilage removal, the lateral conchal incision was made so that the adherent medial conchal skin could be undermined. A medial conchal incision then freed the curved strip of cartilage, which was typically 3 to 6 mm wide and 20 to 30 mm long (Figure 1, C). In some cases, conchal cartilage was preserved or a thinner strip was removed, depending on the extent of conchal protrusion and the need to maintain antihelical projection. The conchal strip extended from the midconcha cymba, followed the maximum concavity of the concha cavum, and typically extended to the nadir of the incisura terminalis auris. Occasionally, a portion of the thick antihelical stump at the junction of the concha protruded conspicuously into the conchal pocket after setback, and needed resection.

To accomplish the conchal retrodisplacement, the postauricular skin was widely undermined toward the occiput, in the plane above the mastoid periosteum (Figure 1, B-D). By exposing a point of fixation on the posterior mastoid periosteum so that the retraction of the conchal bowl could be maximized, the medialization and the rotation of the auricle around the axis of the external canal were easily controlled by suture placement (Figure 1, B and D). Mattress sutures of 4-0 polyglactin 910 (Vicryl) were then used for fixation, routinely overcorrecting the medial deflection by 5° to 10° (Figure 1, D). Superior-directed, mastoid-conchal sutures were occasionally required to rotate the auricle and medialize a lateral concha cymba.

Medialization was promoted by the excision of 5 or 6 mm of redundant postauricular skin. The surgical pocket was irrigated, checked for hemostasis, and sutured with 6-0 nylon.

The intended suture lines for the anterior helicoplasty were drawn with gentian violet (Figure 2, A). The lateral line followed the gutter of the helical crease in the scapha, and the medial line was placed in the trough of the fossa triangularis, only crossing the junction of the superior and inferior crura as necessary to stitch the lowest suture.

Through several entry sites, the central portion of the antihelix was then scored longitudinally with a bent, 18-gauge, disposable, hypodermic needle (Figure 2, B).3 Score lines were denser and deeper inferiorly and, accordingly, fewer and more shallow toward the helical rim.

A stab incision was made in the lateral gully of the scapha, parallel to the helical rim, at the entry site of each of the helical mattress sutures (Figure 2, C).12,13,20 Each mattress suture of 4-0 nylon was sewn in a truncated-triangle pattern around a section of the antihelix.13 The sutures were oriented radially from the center of the fossa triangularis.13 They went through the cartilage in the horizontal passes and subcutaneously in the vertical passes. Usually, they were not tightened until they had all been placed,14 so that careful control of the tension in these sutures could be applied to form a cornucopia shape in the superior crus, rather than a thin, curved tube.15 The skin around each stab site was undermined with an 18-gauge, disposable, hypodermic needle, allowing the knots to be easily oversewn with 6-0 chromic fast-absorbing sutures.12,13 A cotton ball coated with ointment was placed in the bowl, and a gentle head dressing was applied. Patients were instructed to keep their heads elevated and to avoid hot showers for 2 days.

COMMENT

Helical and conchal procedures, alone or together, have been advocated since the advent of a cartilaginous approach to otoplasty was introduced by Ely2 in 1881. Recent otoplasty thinking focuses on tissue reshaping rather than on removal, so that the preservation of perichondrium on both sides of any excised cartilage is universally preferred; yet, controversy surrounds the necessity of conchal cartilage and postauricular skin excision.
Figure 1. Posterior approach. A, Area of intended cartilage excision. B, Postauricular incision (the x’s indicate the points of potential cartilage fixation). C, Cartilage strip removal. D, Conchal-mastoid mattress suture fixation.

Figure 2. Anterior approach. A, Marking suture lines. B, Transcutaneous cartilage scoring. C, Antihelical mattress suture placement.

to allow and maintain setback.\textsuperscript{10,11} While Gersuny\textsuperscript{16} described conchal repositioning with conchal-mastoid sutures after modest cartilage excision as early as 1903, Barnes and Morris,\textsuperscript{9} and later Furnas,\textsuperscript{10} demonstrated that acceptable conchal setback may be achieved without cartilage removal. Tissue preservation minimizes the risk of conchal contraction, undesirable edges, and sulcus obliteration, but if sutures fail, the cartilage may rebound laterally.\textsuperscript{4,5} This limited study with short-term follow-up described herein had no failures, and larger series of similar procedures also indicated that problem cases were anecdotal.\textsuperscript{4,5}

A postauricular incision with skin excision for simple retrusion of the auricle, which was introduced by Diffenbach\textsuperscript{1} in 1848 as the first modern effort at otoplasty, is required whenever redundant skin excision is performed. Skin tension generated by postauricular skin excision adds stability to the conchal position, especially during the healing period.\textsuperscript{15,20} Anterior helical suturing circumvents the need for similar skin excision behind the helix.\textsuperscript{12-14,20} Although nylon may be preferable for helical sutures because of its low tissue reactivity, polyglactin 910 sutures appeared to maintain conchal cartilage position until a binding scar reaction was established.\textsuperscript{21}

Anterior helical approaches, as a means to access the lateral cartilage surface, originally had numerous advocates, but this trend was reversed when Mustarde\textsuperscript{14} introduced the technique of posteriorly placed mattress sutures for helical deflection.\textsuperscript{11,15} Some weakening of the lateral surface of the antihelix, by scoring, scratching, rasping, sanding, or wirebrush, has often been beneficial and has been shown histologically to allow the selective spread of the lateral surface of the antihelical cartilage.\textsuperscript{11,17-19}

The anterior-posterior otoplasty relies on anterior, transcutaneous suturing for helical correction and postauricular, stabilizing sutures to uncurl the concha, using the suture tension in both areas to adjust the tissue

![Figure 4. Case example of an anterior-posterior otoplasty. A, Preoperative frontal view. B, Postoperative frontal view. C, Left auricle before surgery. D, Left auricle after surgery.](image)
Kaye’s minimal-incision, anterior approach was recently modified by Peled, who weakened the lateral surface by needle scoring, as introduced by Vecchione. Peled’s “knifeless otoplasty” has proved to be a minimally traumatic and reliable way to produce a predictable medial deflection of the helix, and was adapted with small modifications for the anterior portion of the anterior-posterior otoplasty. However, helical and conchal repositioning solely by percutaneous sutures, as demonstrated by Fritsch, may also be effective in select cases.

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REFERENCES