



Pediatric otoplasty

Bryan T. Ambro, MD, MS,^{a,b} Jacque Lebeau, MD^b

From the ^aDivision of Facial Plastic & Reconstructive Surgery, University of Maryland Medical Center, Baltimore, Maryland; and

^bDepartment of Otorhinolaryngology—Head and Neck Surgery, University of Maryland Medical Center, Baltimore, Maryland.

KEYWORDS

Pediatric otoplasty;
Protruding ears;
Mustarde and Furnas
techniques

Congenital external ear protrusion is most commonly due to a deficient antihelical fold, an overdeveloped conchal bowl, or from a combination of both. Pediatric otoplasty performed prior to reaching school age can restore a natural appearing external ear therapy precluding peer ridicule and potential adverse psychological and developmental consequences. A graduated surgical approach to the prominent ear may involve a combination of cartilage cutting and cartilage sparing techniques so that an individualized surgical plan can be executed to optimize successful outcomes.

Published by Elsevier Inc.

Dating back to the late 19th century, numerous otoplasty techniques have been described to correct the excessively prominent auricle. Inspiring many of these techniques is the surgeon's desire to attain esthetically pleasing external ear proportions and to prevent the psychosocial implications for the developing child. Children affected by auricular deformities experience frequent ridicule by their peers, which can contribute to a range of developmental abnormalities and social phobias.

Generally speaking, otoplasty surgery can be divided into 2 broad technique categories: cartilage cutting and cartilage sparing. Cartilage-cutting techniques rely on weakening the inherent cartilage spring by excising, scoring, shaving, and/or abrading the cartilage. Cartilage-sparing techniques are more conservative and use permanent sutures to bend the pinna into the desired shape. The authors typically prefer sparing maneuvers to those that excise cartilage, as cut ends of cartilage can produce anterior contour irregularities visible through the thin overlying skin. However, it is not uncommon for surgeons (these authors included) to use a combination of techniques from the 2 categories.

Protruding ears (also known as *prominauris* or *prominotia*) are most commonly the result of an underdeveloped antihelical fold (two-thirds of cases) and/or an excessive amount of conchal bowl cartilage (one-third of cases). Less commonly, pinna protrusion can be the result of the lobule that can be either excessive in size or laterally positioned. The list of published techniques to correct these common abnormalities is long, and even a cursory review is beyond the scope of this article. Rather, we focus on the Mustarde¹ and Furnas² techniques that are intended to correct the deficient antihelix and excessive concha, respectively. We believe that best outcomes follow a graduated approach to the prominent ear and subtle modifications of these 2 techniques.

Preoperative assessment

Pediatric otoplasty may be considered as early as 5 years of age. By this age the auricle has attained 90% of average adult size, the cartilage is still pliable, and the child is able to understand and cooperate with postoperative care. Moreover, this timing allows the auricular deformity to be corrected before the child begins school, thereby avoiding peer ridicule and its potential adverse psychological consequences.

Address reprint requests and correspondence: Bryan T. Ambro, MD, MS, University of Maryland Medical Center, 16 South Eutaw Street, Suite 500, Baltimore, MD 21201.

E-mail address: bryanambro@yahoo.com.



Figure 1 Three points from which auriculocephalic measurements are taken: the superior most aspect of the helical rim, the lateral most projecting point along the mid rim, and a point level with the intertragal incisura.

Detailed and accurate preoperative measurements are critical to surgical planning and successful outcomes. The overall height and width of the ear are measured. In addition, 3 points are marked along the helical rim, and measurements are taken to the scalp and mastoid skin (Figure 1). The first point is made at the superior most aspect of the rim. The lateral most projecting point along the midrim is the second point, and a third measurement is taken along the rim at a point level with the intertragal incisura. These measurements are then compared with the opposite ear, and any asymmetries are noted and communicated to the parents. The goal of surgery is to produce the ideal auriculocephalic distances of 10-12 mm superiorly, 16-18 mm at the middle third, and 18-20 mm inferiorly.

Surgical technique

Pediatric otoplasty is typically performed under general anesthesia. With the table turned 180 degrees from the anesthesiologist, the patient is prepped and draped with both ears in the field to allow for head rotation and intraoperative comparison. The ears are measured once again and recorded on the drapes so the surgeon can easily refer to them throughout surgery. A preoperative dose of intravenous antibiotics is routinely given. An eccentric fusiform excision is designed several millimeters anterior to the postauricular sulcus on the posterior concha (Figure 2). The width of the excision correlates to the amount of planned conchal retrodisplacement. The apices of the excision extend to a point 1 cm from the superior and inferior poles so the

resultant scar will be well concealed. The postauricular skin and mastoid soft tissue are then infiltrated with equal parts 1% lidocaine with 1:100,000 epinephrine and 0.25% bupivacaine with 1:200,000 epinephrine to aid in vasoconstriction and hydrodissection. The skin and thin subcutaneous soft tissue of the ear is excised, with the surgeon taking care to preserve the perichondrium. The posterior auricular skin is then widely undermined with scissors in the supraperichondrial plane. If horizontal mattress sutures are planned for the antihelical fold, a releasing incision is made obliquely at the superior extent of the excision to allow for greater exposure and ease of suture placement. The postauricular dissection is carried out for several centimeters over the mastoid periosteum, and a small amount of soft tissue is excised from within the sulcus if conchal setback is planned.

If the patient has both conchal bowl excess and a deficient antihelical fold, the concha is corrected first. We find that following this sequence can minimize (or even preclude) misguided antihelical overcorrection because there is often less need for antihelical correction than initially anticipated.

If the conchal cartilage is thin and pliable, a suture-only Furnas technique is used. However, if the cartilage is stiff or if the bowl is excessively deep, the authors perform shave excisions of the conchal eminence to decrease the resiliency. The weakened cartilage is then set back with 2 permanent sutures placed from the concha cavum and the concha cymba to the mastoid periosteum (Figure 3). The authors prefer a 4-0 Mersilene suture (Ethicon, San Francisco, CA) with a spatula needle tip, which we find makes it easier to ensure that a 4- to 5-mm purchase of the cartilage and anterior perichondrium is obtained, thereby minimizing the likelihood of the suture pulling through. After both suture passes have been made, they tied down. The bowl is then drawn in a posterior direction to prevent the compressed cartilage from narrowing the external auditory canal (Figure 4).



Figure 2 An eccentric fusiform excision is designed several millimeters anterior to the postauricular sulcus on the posterior concha. A releasing incision (dashed line) can be made obliquely to increase exposure.

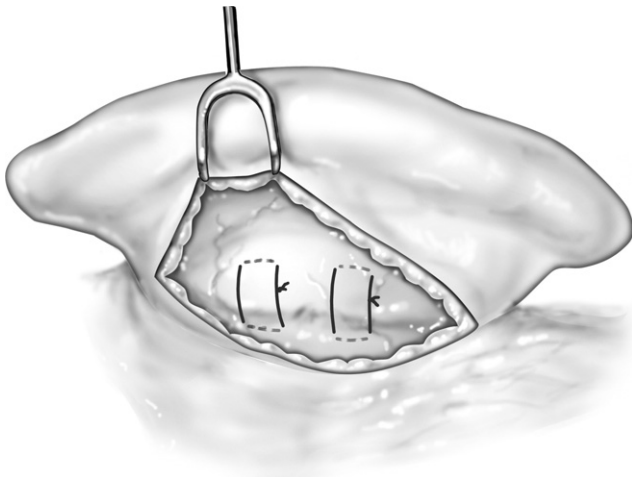


Figure 3 Two conchal setback (Furnas) sutures placed from the concha cavum and the concha cymba to the mastoid periosteum.

Once the concha has been repositioned, the antihelix is addressed. The authors use temporary contouring sutures to facilitate placement of permanent Mustarde sutures.³ This is done by placing 2 or 3 horizontal mattress prolene sutures

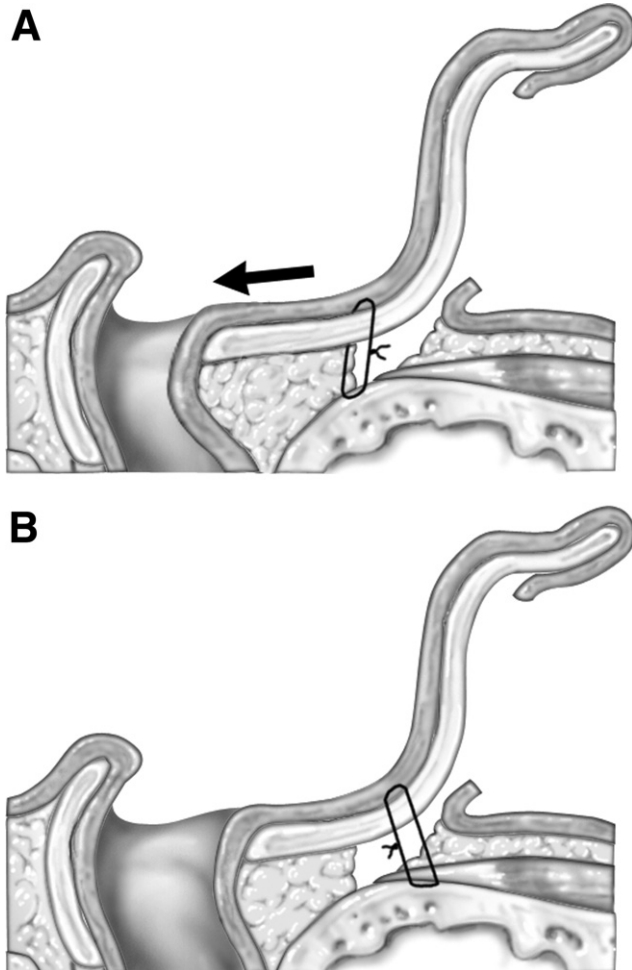


Figure 4 (A) Side view of incorrect anterior placement of conchal setback sutures resulting in a narrowed external auditory canal. (B) Proper suture placement in a posterior direction.

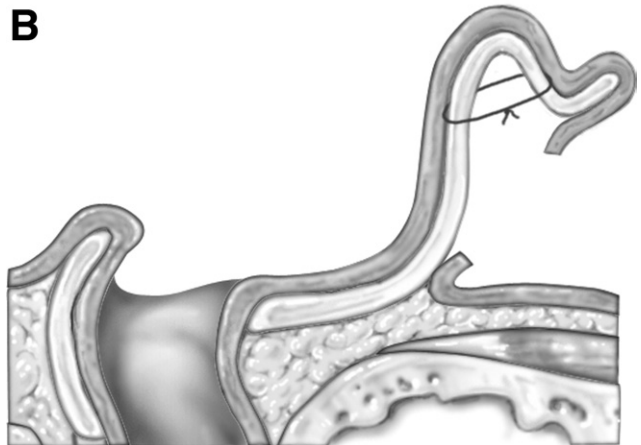
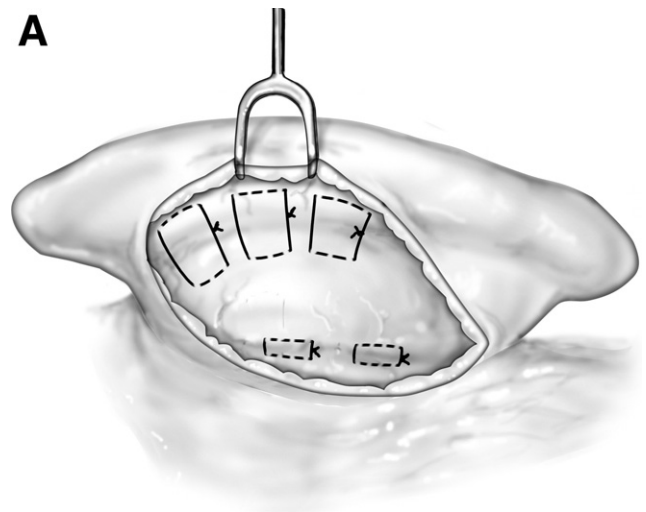


Figure 5 (A) Posterior view of horizontal mattress scaphaconchal (Mustarde) sutures used to recreate a deficient antihelical fold. (B) Side view.

through the anterior skin and cartilage to fix temporarily the antihelical fold in the desired position until permanent 4-0 Mersilene sutures are in place.

The superior-most stitch is placed first to create the superior crus. This is followed by a stitch at the most inferior portion of the deficient antihelix, and subsequent stitches (if needed) are placed along the intervening portion of the antihelix to create the desired contour (Figure 5). These scaphaconchal sutures are then tightened to the point that tension is taken off the temporary contouring sutures, and they are knotted in the same sequence they were initially placed. The temporary sutures are then removed, and intraoperative auriculocephalic measurements are repeated. After the second ear is completed, a final set of interauricular measurements is made to ensure symmetry. Finally, it should be noted that during placement of Mustarde sutures we typically overcorrect by 2 mm to accommodate for the several millimeters of relaxation seen during the first few postoperative months.

Pediatric patients, in whom the inferior pole contributes to the auricular deformity, usually have either a lobule that is either excessive in size or laterally positioned. A simple, full thickness wedge excision of a large lobule can restore it to a normal size. A laterally positioned lobule is often the result of

a prominent cauda helicus that can be corrected by either suturing it to the concha or sharply excising it.

Before skin closure, the wound is copiously irrigated with an antibiotic-laden saline solution. The subcutaneous layer is approximated with several interrupted 5-0 PDS sutures and the superficial skin is closed with a running 5-0 fast-absorbing gut suture. A rubber-band drain is positioned at the inferior extent of the closure, and this is removed when the dressing is removed on postoperative day 1.

Postoperative care

At conclusion of the procedure, an antibiotic ointment is placed over the incision, and Xeroform gauze (Tyco Healthcare Group, Mansfield, MA) is placed into the anterior concavities as well as the postauricular sulcus. Soft fluff dressings are then placed over the gauze, and a bilateral compressive mastoid dressing is secured. The patient is discharged home on a 3-day course of oral antibiotics and a liquid narcotic for pain control. After the dressing and drains are removed on postoperative day 1, the patient is instructed to wear a soft headband over the ears continu-

ously for 2 weeks and then only at night for an additional 2 months.

Complications

Otoplasty complications may be grouped into early and late occurrences. Early problems occur in the first 1-4 days postoperatively; they include hematoma, cellulitis, perichondritis, or necrosis of the cutaneous flap. Late complications include keloid formation, suture extrusion, postauricular webbing, hypoesthesia, poor cosmetic result, and auricular asymmetry.

References

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