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## Issue Stories

### THE FACE

#### The Art and Science of Otoplasty

by Joseph Niamtu III, DMD

#### Improving the self-esteem of grateful children is one of the joys of cosmetic ear surgery

Talking to cosmetic surgeons about otoplasty is like asking people about politics. Everyone has a different opinion. It is true that a myriad of procedures exist for this seemingly simple operation. Quite a lot is written on the subject—for example, a quick search for "otoplasty" on PubMed yields 289 entries, and on Google there are 339,000 entries.

Otoplasty is one of those procedures that involves art and science. It is one of the few cosmetic procedures performed on healthy children. Prominauris (protruding ears) affects about 5% of the population, or 1 out of 12,500 births.

For most surgeons, otoplasty is a fun procedure to perform. In addition, it is rewarding to see the results of improving the self-esteem of young children and adults. As with any other procedure, the best technique is the one that works well for the individual surgeon, as well as one that produces positive and lasting results with low complications.

Although there are many different ear deformities, protruding ears is the most common reason why this procedure is requested.

Ear protrusion results from two main problems,



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the most common of which is the lack of a defined antihelical fold. Overprojection of the conchal cartilage in the posterior conchal wall is also common (Figure 1). Most patients present with a combination of both problems,<sup>1</sup> and protruding lobes can also add to the deformity.

Figure 1. A normal antihelical fold (left) and a patient without a defined antihelical fold (right).

One of the most important factors concerning otoplasty surgery is at what age to operate. One of the prime reasons for performing this surgery early is that peer ridicule in grade school can begin very early during the development of a child's body image, and can possibly affect his or her self-esteem for life. Realizing this and correcting the deformity before the child starts school is advantageous, as 85% of ear development is complete by age 3 and the ear is fully developed at 7 to 8 years of age.

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## SETTING THE EAR BACK

Obviously, a lot of personal preference is involved with otoplasty. I believe that attempting to correct

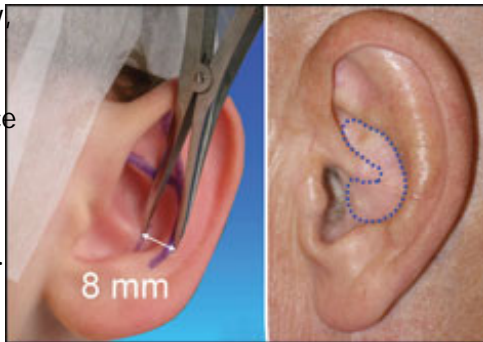


Figure 2. Left: The measurement of 8 mm on the posterior conchal wall—this is the height of the cartilage that will remain. Right: The outline of the excess conchal bowl cartilage that will be removed from the posterior to auricular surface.

a hypertrophic conchal bowl by merely "setting it back with sutures" is a mistake, as the elastic memory of the cartilage will frequently trump conchal setback sutures. Pinning the conchal cartilage to the mastoid fascia with sutures has, for many surgeons, not proven to be stable.

In addition, pinning the conchal bowl posteriorly causes the anterior portion of the bowl to slide forward, which can obscure or otherwise deform the external auditory canal—a common complaint of some patients.

The procedure I prefer for conchal bowl excess was described by Davis in 1978<sup>2</sup> and involves removing the excess conchal cartilage to reduce the hyperplastic posterior wall of the conchal bowl.

Measuring and marking 7 mm to 8 mm inferior to the conchal/scaphal junction, which will be the posterior portion of the conchal wall that is not excised, starts the procedure. By leaving approximately 8 mm, the ear will set back to a normal position.

This

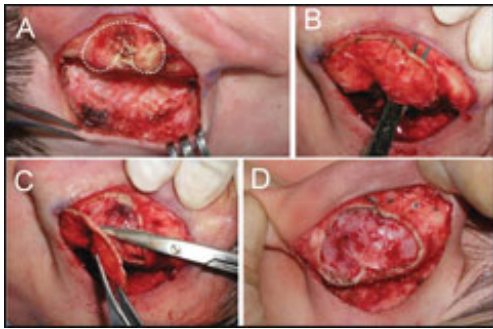


Figure 3. The outline of the proposed cartilage excision as well as the soft tissues excised from the mastoid fascia, which will become the new floor of the conchal bowl (A). Figures 4B and C show the "kidney bean"-shaped excess conchal cartilage being dissected from the thin overlying skin. Figure 4D shows the excess cartilage excised with the dermal surface of the overlying skin exposed. This cartilage excision will allow the ear to set back to a normal position.

marking will include the entire hypertrophic conchal bowl and result in a "cashew nut"—or "kidney bean"—shaped excision (Figure 2). Local anesthetic is injected subcutaneously to hydrodissect the thin overlying skin of the conchal bowl, and a routine posterior auricular incision is made.

There is no need to remove excess skin other than the redundancy from the setback. Removing more skin than this does little to keep the ear in position and, if closed with tension, irregular and unsightly scarring can occur.

Posterior dissection proceeds immediately to the perichondrium of the posterior conchal cartilage. All soft tissues, including the vestigial posterior auricular muscles, are removed to the level of the mastoid fascia (Figure 3).

Tissue dissection with a small radiofrequency bipolar forcep (Ellman International, Oceanside, NY) greatly facilitates dissection and provides simultaneous hemostasis.

It is important to have a smooth surface of the exposed mastoid fascia, as it will serve as the "new" floor of the conchal bowl (Figure 3A).

After the posterior auricular dissection is completed, an outline of the planned conchal cartilage excision is made using a 25-gauge needle and methylene blue tattoo.

The "kidney bean"-shaped outline of conchal floor is incised with a scalpel or radiofrequency fine wire electrode and then is dissected from the anterior skin (Figures 3B and 3C).



Figure 4. A cotton roll keeps the skin intimate to the new conchal floor and eliminates dead space. The image on the left shows the bolster sutures in place as they pass from the skin, through the mastoid fascia, and back through the skin. The center image shows a dental cotton roll in place. The right image shows the bolster sutures tied down. The cotton roll can also be tucked in the external auditory canal to discourage stenosis.

Finally, the excess cartilage is removed, leaving the anterior auricular skin (Figure 3D). By removing the excess conchal cartilage and leaving 8 mm of height, the ear will generally lie in a normal passive position. Some adjustment of the excision margins may be necessary to achieve the final desired posterior ear position.

For patients with a normal antihelical fold, this procedure may be all that is necessary for correction of protrusion.

The final step in the Davis procedure is to use 3-0 silk to place bolster sutures to secure a cotton roll in the revised conchal bowl (Figure 4). The sutures are placed through the skin, where they secure the mastoid fascia and then go back through the skin again.

The bolster serves to eliminate dead space, prevent hematoma, and keep the ear in the desired position during the initial healing. These sutures are removed at 14 days postsurgery. Some surgeons employ other direct methods of securing the incised conchal bowl to the mastoid fascia.

More frequently, patients manifest conchal excess as well as an underdeveloped antihelical fold, requiring reconstruction of the

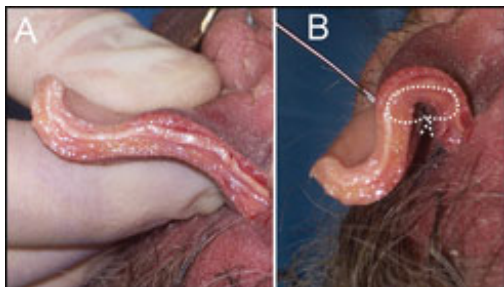


Figure 5. Left: A cadaveric specimen with a poorly formed antihelical fold. Right: A rendition of how the Mustardé suture re-creates the new antihelical fold.

antihelical fold along with the Davis procedure. Ninety-nine percent of the otoplasty patients I treat need both procedures. If a Mustardé procedure is required, it is performed after the conchal bowl reduction and before the bolster suture placement.

## RECONSTRUCTING THE FOLD

Patients without hypertrophic conchal cartilage may benefit from antihelical fold reconstruction as a sole procedure. This procedure will set back the helix to a more normal position as well as create a normalized antihelical fold.

Attempting to perform this procedure in a patient with conchal cartilaginous hypertrophy will not properly and aesthetically correct the problem. Again, most patients have a component of conchal cartilage hypertrophy as well as a lack of definition of the antihelical fold, and thus they will benefit from both Mustardé and Davis procedures.

The Mustardé procedure was described in the 1950s<sup>3</sup> and has been since progressed with



Figure 6. A typical case of unfurled antihelical fold (left); the presence of an antihelical fold when the surgeon pushes the helix posterior (center); and an image that shows the Davis and Mustarde' markings in place (right).

numerous modifications. The goal of this procedure is to re-create the antihelical fold by using horizontal mattress sutures, as well as to reposition the superior helix.

I perform the Davis procedure first, the Mustardé sutures second, and then finish with lobe adjustment, if necessary. Preoperatively, the helical rim is positioned posteriorly with the finger to create an antihelical fold (Figure 6).

This fold and the planned suture entry points are denoted with a surgical marker. The art of the Mustardé procedure is to realize where and how many sutures to place to obtain a naturally formed, rounded, and curved fold.

The shape and position of the new fold is directly related to the placement and position of the 4-0 Mersilene horizontal mattress sutures. Placing them too closely together will create a narrow fold. Placing them too far apart will create too wide of a fold—improper spacing can result in a straight antihelical fold, which is a sine qua non of poor otoplasty technique.

Although sometimes frustrating, it is not uncommon to replace the sutures in lieu of a better-positioned suture during the procedure. Continuous

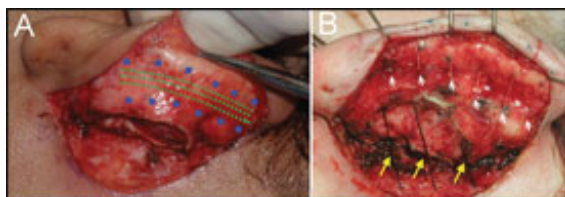


Figure 7. Left: The proposed Mustardé suture points (blue dots) and the green lines indicate areas of cartilage scoring, which can weaken the undersurface of the new antihelical fold. Right: We see the actual Mustardé sutures in place (white arrows) and the black silk bolster sutures used in the Davis procedure (yellow arrows).

attention to suture placement of an anatomy of the new antihelical fold is imperative. Figure 5 shows a cadaver dissection of an ear with an unfurled antihelical fold and the desired re-creation of the antihelical fold.

To reconstruct the antihelical fold, the ear is pushed posteriorly and the new fold is apparent (Figure 5). This is marked with a surgical marker, as are the anticipated suture points for the Mustardé horizontal mattress

sutures (Figure 7A). It is important to place the sutures at least 7 mm lateral to the center line of the new fold, in order to prevent a narrow or constricted antihelical fold.

The surgical markings on the skin surface are then tattooed with a 25-gauge needle and methylene blue. Prior to placing the sutures, the cartilage is scored to make a weakening along the back of the proposed fold.

This is a controversial maneuver, as some surgeons say it is not necessary, some say the posterior surface of the



Figure 8. Triangular skin excision on the inferior lateral posterior lobe and the mastoid skin can serve to tack the earlobe posteriorly. A deep fixation suture can also assist the setback of the lobe.

proposed fold should be scored, and still others advocate scoring the anterior surface for a smoother fold.

I prefer to use a scalpel to score several grooves along the posterior surface of the proposed fold (green lines in Figure 7A).

The surgeon must not make the scoring too deep or too close together, as the result might be a bunched or irregular antihelical fold. Instead of long cartilage scores, small "pie crust" stabs can be made with a scalpel blade along the fold.

After the cartilage is scored, the horizontal mattress sutures can be placed. In general, I use three (4-0) white Mersilene sutures. The first suture is superior and will improve the fossa triangularis, as well as set the helix and helical rim posteriorly. If this is placed too cephalad, it can distort the superior margin of the helical rim.

The next suture is placed about midway down the antihelical fold in a manner that curves and tapers the new antihelical fold. A third suture is usually placed at the lower third of the fold, which aids in definition and taper.

In some cases, fewer than three sutures will suffice, whereas other patients require additional sutures depending on the deformity. Care must be taken to engage cartilage only and to not perforate

the thin overlying skin. This should be checked at each needle pass.

The surgeon adjusts the suture tension to control the formation of the new antihelical fold and the amount of superior helix setback. Figure 7B illustrates the Mustardé sutures in place.



Figure 9. This 16-year-old male underwent Davis and Mustardé otoplasty for protruding ears.

If a Davis procedure is performed concomitantly with the Mustardé operation, the bolster sutures are not placed until the Mustardé procedure has been completed. The posterior incision is closed using 4-0 gut sutures before the bolster sutures are tied down—otherwise, access is limited.

## CORRECTION OF THE PROTRUDING EARLOBE

Ears that protrude frequently are accompanied by protruding earlobes. Novice surgeons may not realize this, and the final result can be compromised.

Numerous means of setting back protruding lobes have been described. A "fishtail" skin excision is a simple technique that utilizes triangular excision of skin on the inferior lateral posterior lobe and a corresponding excision over the mastoid region. Bringing the lobe to the mastoid area with suture closure will posteriorly position the lobe (Figure 8).

Another method is to secure the inferior deep portion of the lobe with a suture when closing the inferior incision. The suture pulls the lobe posteriorly and secured to deep tissue when tying.

## CONCLUSION

There are diverse means of correcting protruding ears, and I have discussed two techniques that have proven safe, predictable and stable in my practice. This is not the only way to correct this problem. Practitioners can utilize a plethora of surgical options to achieve acceptable results.

Otoplasty is one procedure that is fueled by a combination of art and science, which makes it a very rewarding treatment for both patient and surgeon.

See also "[Advances in Treating Hyperpigmentation](#)" by Jerome Potozkin, MD, in the July 2008 issue of *PSP*.



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**Joseph Niamtu III, DMD, is  
a cosmetic facial surgeon  
in Richmond, Va. He can  
be reached at  
[niamtu@niamtu.com](mailto:niamtu@niamtu.com)**

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