

Chapter 84 – Otoplasty

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Auricular characteristics are inherited as an autosomal dominant trait with variable penetrance. Many of those who are born with an auricular deformity are subject to teasing and ridicule in childhood and become very self-conscious of the appearance of their ears in adolescence and adulthood. Surgical correction of prominent or protuberant ears (Fig. 84-1) may yield very gratifying results with relatively simple surgery. Nonetheless, correct analysis of the deformity preoperatively and a well-designed and well-executed surgical plan are fundamental requirements for optimal patient satisfaction and stable long-term results. With a good result, patients will derive both psychological and cosmetic benefit.

The purpose of corrective surgery is to re-establish what are considered “normal contour lines” (Fig. 84-2) of the external ear, as well as the relationship of the external ear to the scalp.



Figure 84-1 Typical patient with protuberant ears.

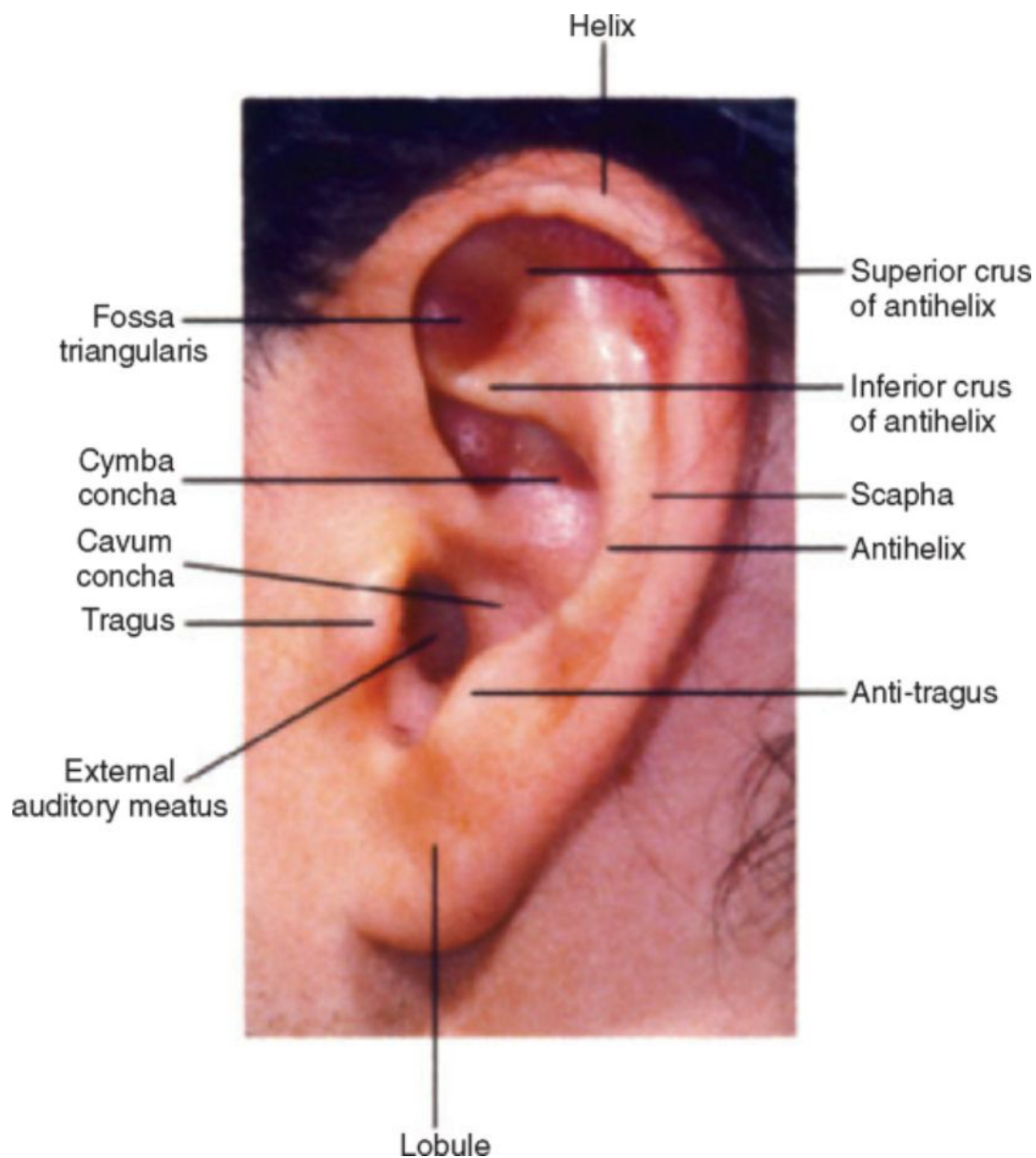


Figure 84-2 Normal auricular anatomy.

PATIENT SELECTION

Patients will generally be in one of three categories:

- Absence of the antihelical fold (thereby unfurling the upper half of the ear and increasing the auriculomastoid angle)
- A deep overly projected conchal bowl (increasing lateral projection of the ear and the conchomastoid angle)
- Both of the above (Fig. 84-3)

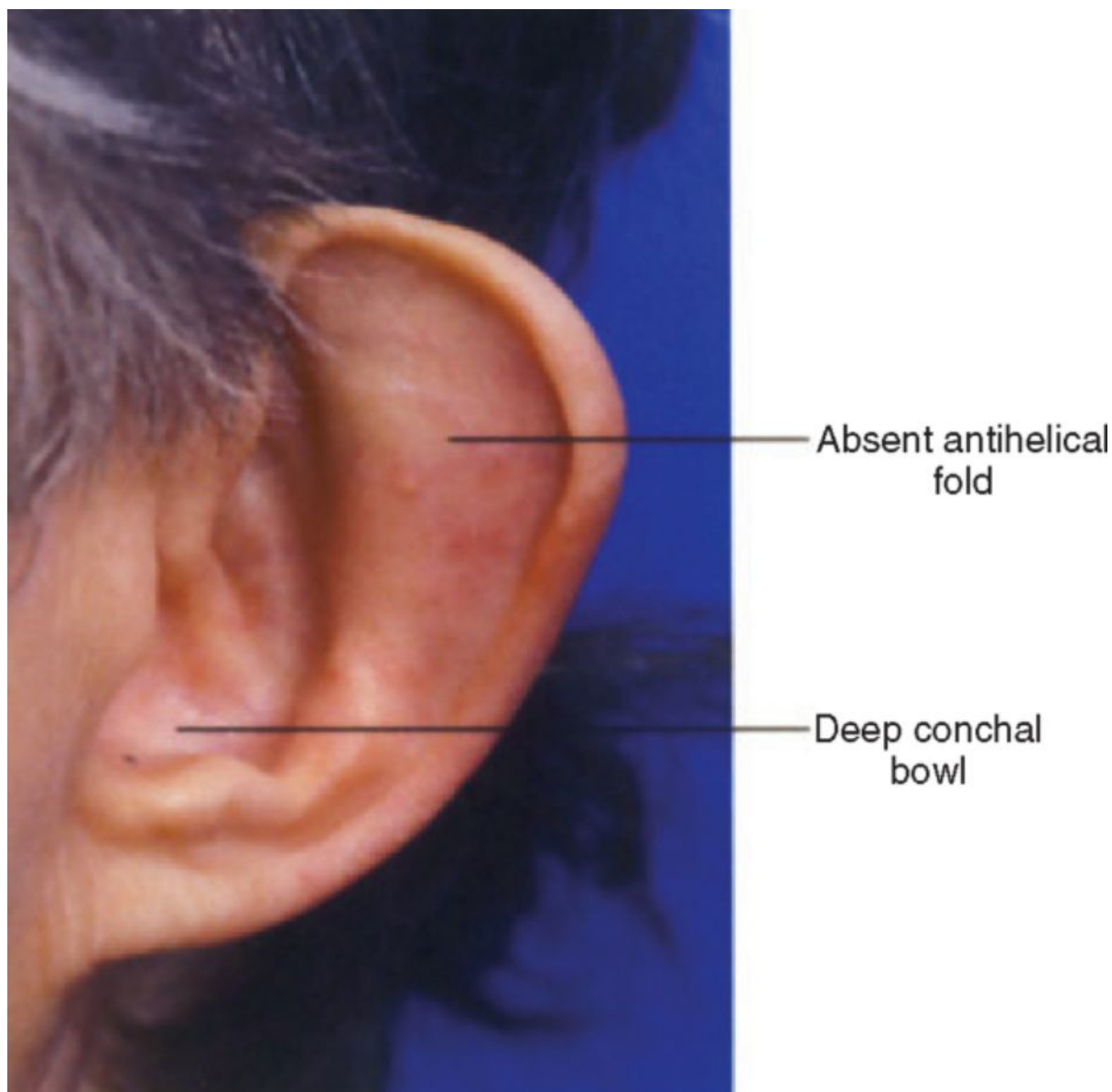


Figure 84-3 Auricular deformity commonly seen in an otoplasty patient: an ill-defined antihelical fold and a deep conchal bowl.

Any of these patients are considered appropriate for otoplasty. As with all cosmetic procedures, the patient must be psychologically stable, be well motivated, and have realistic expectations about the surgical outcome. It is important that the patient recognize that although the goal is perfection, “improvement” with a natural appearance and without complications is an acceptable result.

The timing of the procedure is guided by the patient's own awareness of the deformity. By 5 years of age, the auricle has achieved about 80% to 85% of adult size, so it is preferable to wait until at least this age before considering surgery. If the deformity is exceptionally emotionally disturbing to the child, the procedure may be performed just before the child begins school. There is no end point beyond which the surgery could not be performed; however, as the ear cartilage ages, it loses its flexibility, thereby restricting the response to surgical manipulation.

PREOPERATIVE PLANNING

Preoperative planning begins with an evaluation of the deformity.^[1] First, one has to decide whether the problem is due to absence of the antihelical fold, a deep conchal bowl, or both. Simple observation will reveal whether there is a weak or absent antihelical fold. In such cases, gentle finger pressure on the helical rim to create an antihelical fold and set the ear back should indicate whether this corrects the problem sufficiently or whether there is still some protrusion contributed by the depth of the conchal bowl. It is also important to note right-left symmetry preoperatively. Frequently, the two sides are asymmetric, and it is useful to point this out to the patient and the patient's family.

The surgical goals^[1–3] are

- A natural looking, pleasing appearance of the auricular correction
- Creation of an antihelical fold with smooth edges and contour and without sharp edges, ridges, or unsightly scarring
- Reasonable symmetry between the two ears
- An enduring, stable long-term result
- Minimal or no complications, with preservation of a postauricular sulcus

Preoperative photodocumentation is mandatory and should include an anterior full face view, a posterior full head view, full right and left lateral views, and close-up lateral views.

Reasonable surgical outcomes, as well as possible complications, are discussed preoperatively (see later). Ultimately, ears that do not attract attention to themselves will be the measure of success to the patient.

SURGICAL TECHNIQUES^[3–5]

Otoplasty for protuberant ears in children is usually performed under general anesthesia. In older children and adults, local anesthesia with or without intravenous sedation can be used.

The position and site of the planned antihelical fold is determined by gently furling the ear with fingers on the helical rim until a pleasing natural antihelical fold is apparent. Markings are made symmetrically on either side of the fold to guide the site of later placement of horizontal mattress sutures.

To gauge the amount of postauricular skin to be removed, the ear is manually set back against the scalp and the amount of redundant skin determined. An ellipse is then marked on the posterior auricle to outline the skin excision. The width of the ellipse is thus individualized but generally measures 15 mm (± 5 mm) at its maximal width. Conservatism is warranted because more skin can be excised incrementally at any time if need be. The ellipse incorporates the postauricular sulcus but is not centered on the sulcus—it is biased toward the posterior auricular surface so that more skin is removed from the ear than from the scalp. In addition, within about 5 to 7 mm of the lobular attachment inferiorly or the helical root superiorly, the ellipse curves onto the auricle so the scars will not extend beyond the sulcus and risk being visible on a lateral view.

The face, both ears, and the surrounding occipital areas are prepared with an antiseptic solution and draped into the sterile field. The postauricular skin is injected with 1% lidocaine with 1 : 100,000 epinephrine. A broad-spectrum antibiotic is administered intravenously before commencing surgery. If the ears are asymmetric, the ear with the more significant deformity is usually done first.

The ear is retracted forward and the ellipse of postauricular skin is excised with a no. 15 blade as outlined (Fig. 84-4). A strip of premastoid soft tissue is excised with electrocautery to ultimately help create space for the auricular setback. With wide two-pronged hooks or Senn retractors placed in the lateral aspect of the incision, the remaining postauricular skin is undermined out to the helical rim in a supraperichondrial plane.

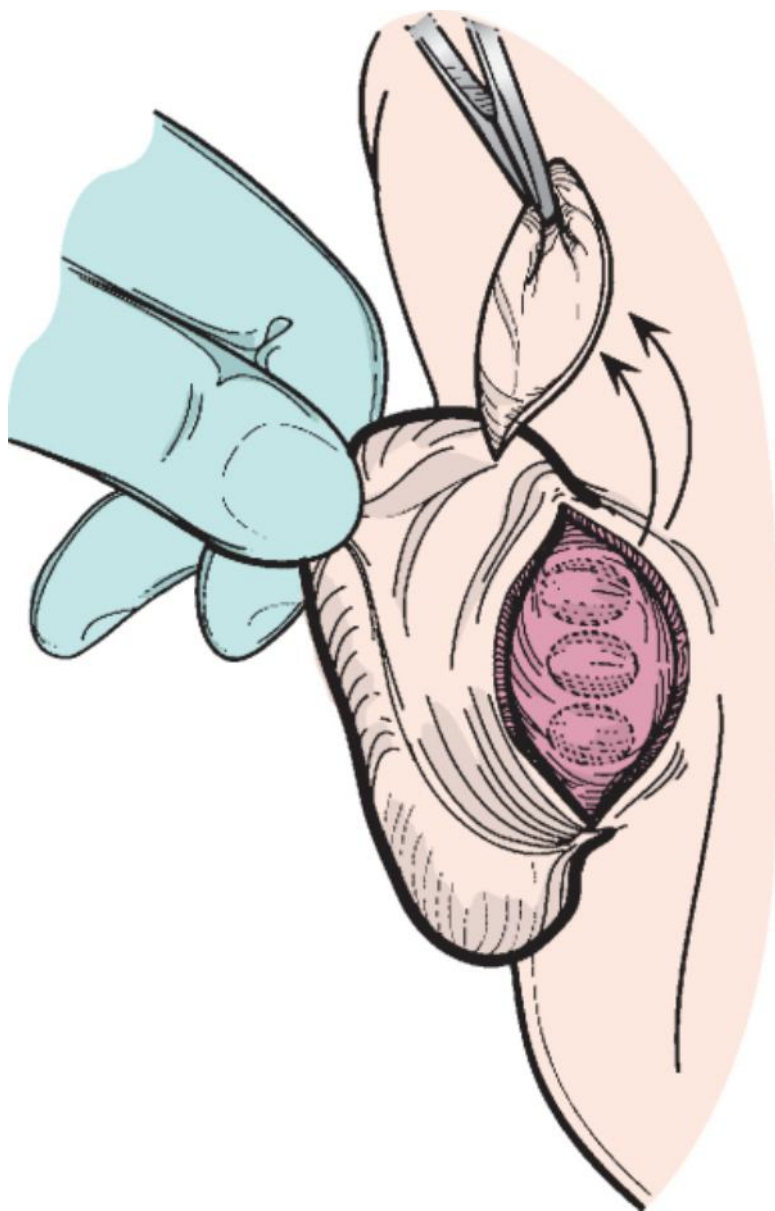


Figure 84-4 Excision of a skin ellipse, as well as partial-thickness “discs” of conchal cartilage to facilitate retrodisplacement of the auricle.

At this point, aligning the wound incision margins (folding the ear back) demonstrates the extent to which the conchal bowl cartilage is interfering with the auricular setback. This maneuver also demonstrates how the conchal cartilage pivots forward at the posterior margin of the external auditory meatus as the ear is set back. To prevent iatrogenic meatal stenosis, a vertically oriented ellipse of conchal bowl cartilage is excised medially just behind the ear canal. The ellipse is about 1 to 1.5 cm in height and approximately 1 cm in maximal width. Incremental excision allows additional removal if need be. There is often some contact between the posterior aspect of the conchal cartilage and the premastoid region as well that can impede satisfactory setback of the ear. In this case one tangentially shaves partial-thickness discs of cartilage from the posterior aspect of the conchal cartilage behind the external auditory canal to further facilitate retrodisplacement of the ear. In addition to preventing inadvertent canal stenosis, this addresses the overly deep protruding conchal bowl as well.

Creation of an antihelical fold is the next step. Markings on either side of the future antihelical fold were made earlier. A no. 15 blade can be used to score the cartilage posteriorly along the line of the fold so that the “spring” of the cartilage is weakened. Incisional approaches to creating an antihelical fold will tend to create a sharp, unnatural-looking antihelical fold. Scoring the cartilage to weaken the spring works better together with the Mustardé sutures.

To ease placement of the cartilage-contouring horizontal (Mustardé) sutures posteriorly, it is useful to initially place two temporary percutaneous contouring sutures^[6] from the anterior (lateral) aspect of the auricle to create and maintain an antihelical fold while the Mustardé sutures are placed posteriorly. This allows the surgeon to move the ear forward and back while placing the Mustardé sutures without concern that these sutures may loosen or

become released. The anterior temporary contouring sutures (4-0 Prolene or silk on Keith needles) are placed in horizontal mattress fashion around the proposed antihelical fold, with both needles passed from the side of the conchal bowl, through into the wound posteriorly, and then back through the auricular skin anteriorly close to the helical rim (Fig. 84-5). Two such temporary sutures are placed and then tightened until a pleasing antihelical fold is created.

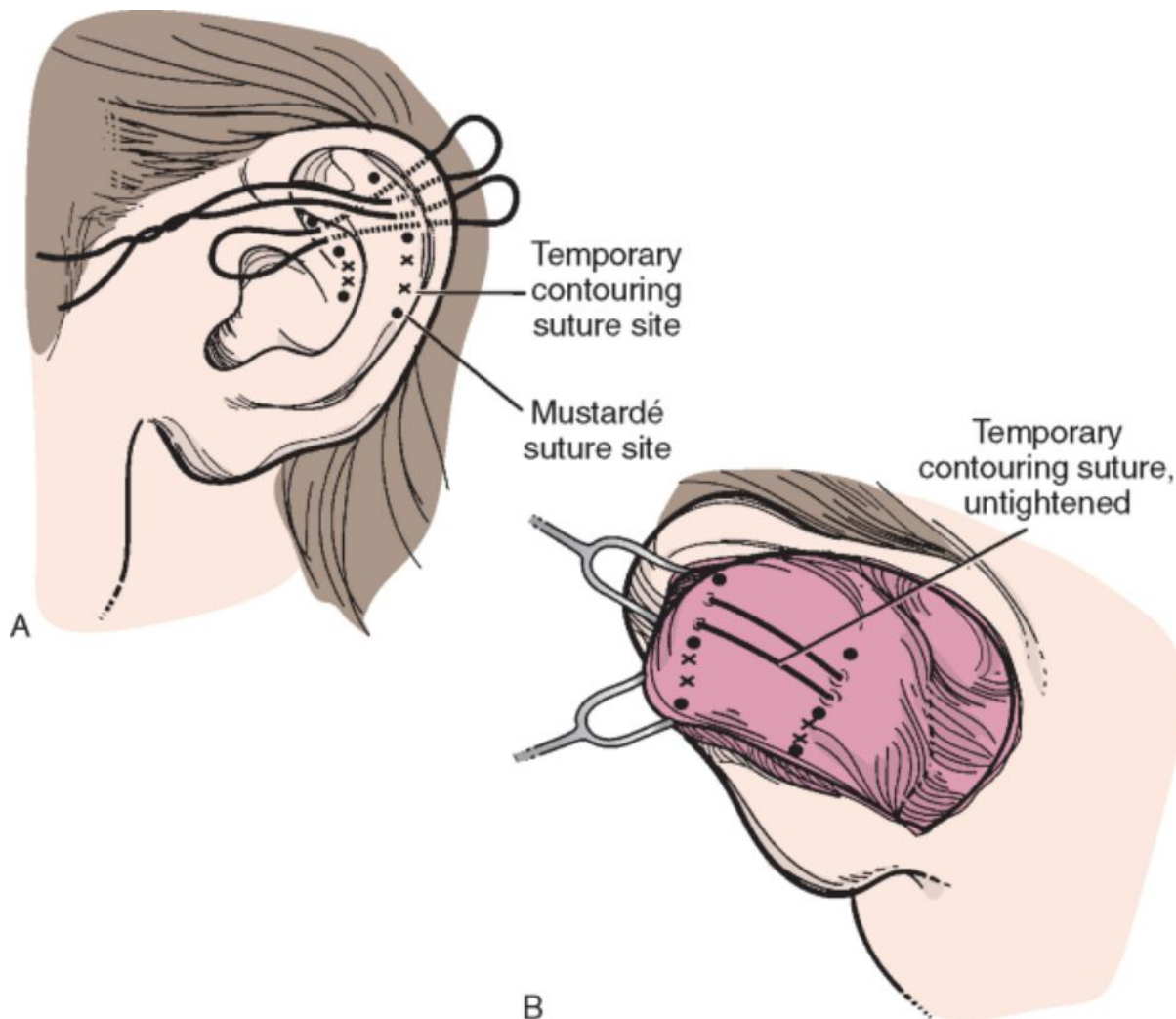


Figure 84-5 Placement of temporary “contouring sutures” to temporarily secure the formation of the proposed antihelical fold.

Attention is then turned posteriorly to placement of the Mustardé sutures.^[7] Two to four 4-0 Mersilene (or similar) sutures are placed through the full thickness of the auricular cartilage in horizontal mattress fashion (as described by Mustardé) (Fig. 84-6) around the neofold and tightened as the anterior temporary sutures hold the position of the fold. Care is taken to ensure that as the Mustardé sutures are placed they do not penetrate the skin anteriorly (Fig. 84-7) and that they are not overtightened, which would create a fold with an unnatural sharp edge. Slight overcorrection will help account for some reprotrusion that often occurs with time. Once the Mustardé sutures are secured, the temporary contouring sutures can be removed.

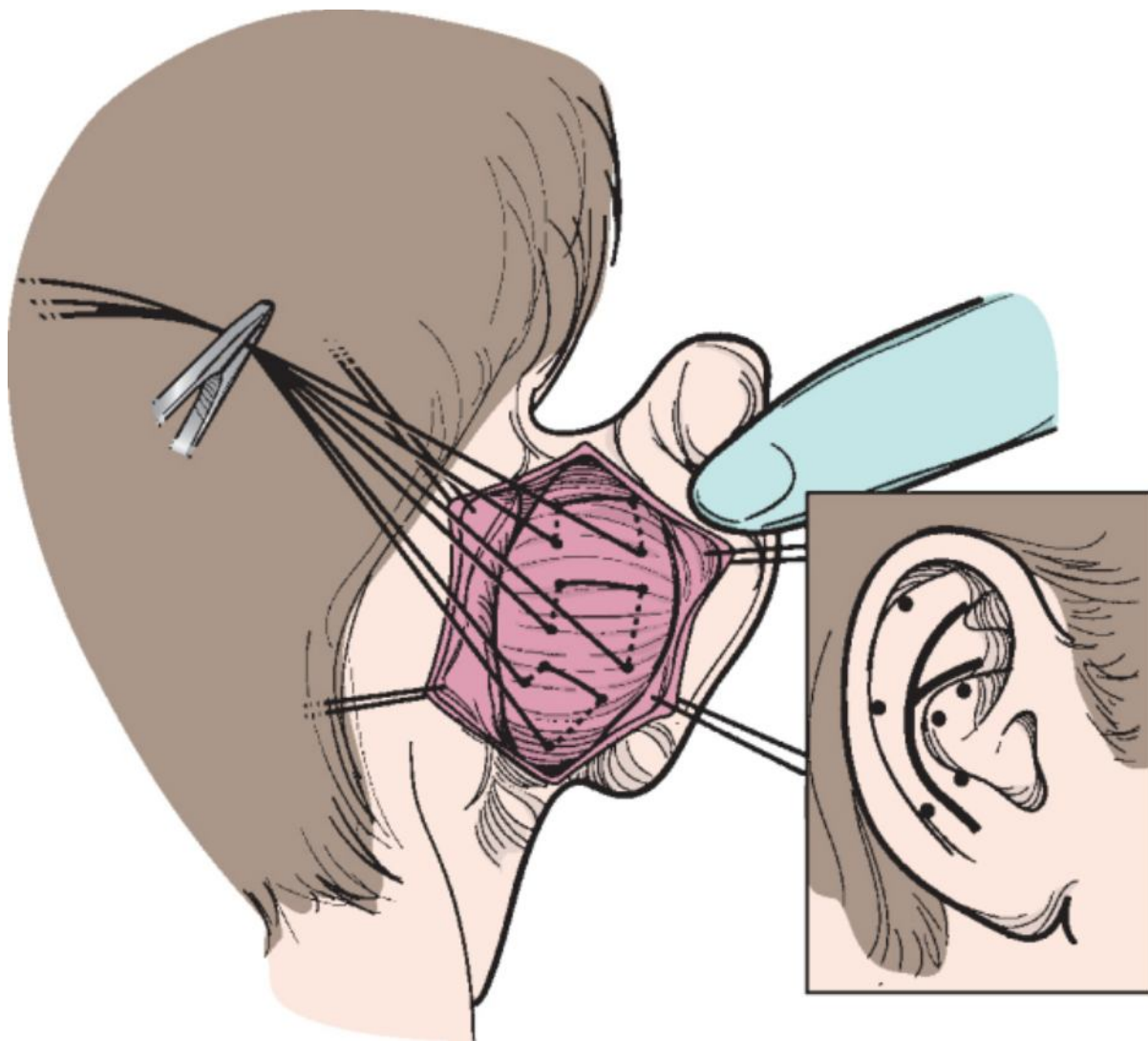


Figure 84-6 Mustardé horizontal mattress sutures as seen from behind the ear.

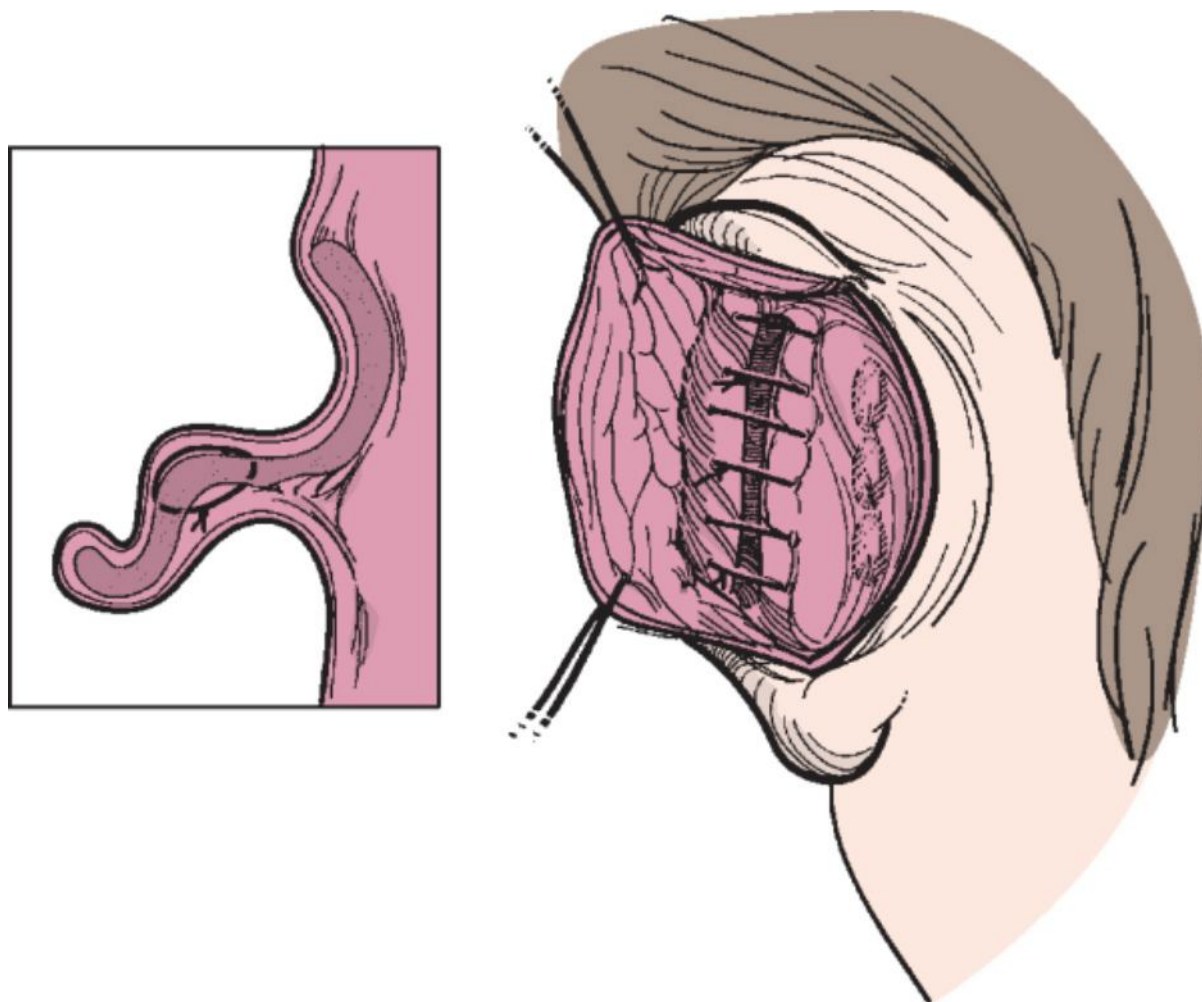


Figure 84-7 Mustardé sutures—coronal view. The suture is placed through the full thickness of the cartilage without penetrating the anterior skin.

At this point the position of the ear is further secured with setback sutures. Conchomastoid 4-0 Mersilene suture is placed from the posterior aspect of the conchal bowl cartilage to the premastoid fascia or periosteum. One or two such sutures may be required. If this suture is placed too far back on the cartilage or too far forward on the mastoid, anterior rotation of the conchal cartilage may be exaggerated and result in some stenosis or compromise of the external auditory canal. Care is thus taken to ensure that the suture passes on the cartilage and the mastoid fascia are either at the same anterior/posterior point or that the pass on the mastoid side is slightly behind the point of purchase on the cartilage.

If some protrusion of the superior pole of the ear still remains, a similar type of setback suture may be placed at a point on the cartilage superiorly in the region of the triangular fossa back to the premastoid soft tissue.

Once one is satisfied with the position of the ear, the skin is closed with 5-0 plain or fast-absorbing gut suture.

Finally, Xeroform gauze or cotton soaked in mineral oil is contoured to the lateral surface of the ear and placed in the postauricular sulcus as well. Fluffs are then applied and a lightly compressive mastoid-type dressing is secured. The dressing should not be so tight that epidermolysis of the skin ensues.

POSTOPERATIVE MANAGEMENT

The dressing is removed on the fifth to seventh postoperative day. Thereafter, the patient is asked to wear a supportive headband at night for 2 to 3 weeks. Incisions can be cleaned with a cotton swab soaked in fresh hydrogen peroxide, and antibiotic ointment can be gently applied to the postauricular incision. Pain medication is usually required only for the first several days. When instructing the parents or the patient, one must advise them of the signs of possible complications at the surgical site, which would probably be manifested as increasing pain, discomfort, or erythema. Patients who experience such signs should contact the surgeon as soon as possible.

A typical patient, preoperatively and postoperatively, is presented in Figs 84-8 and 84-9.

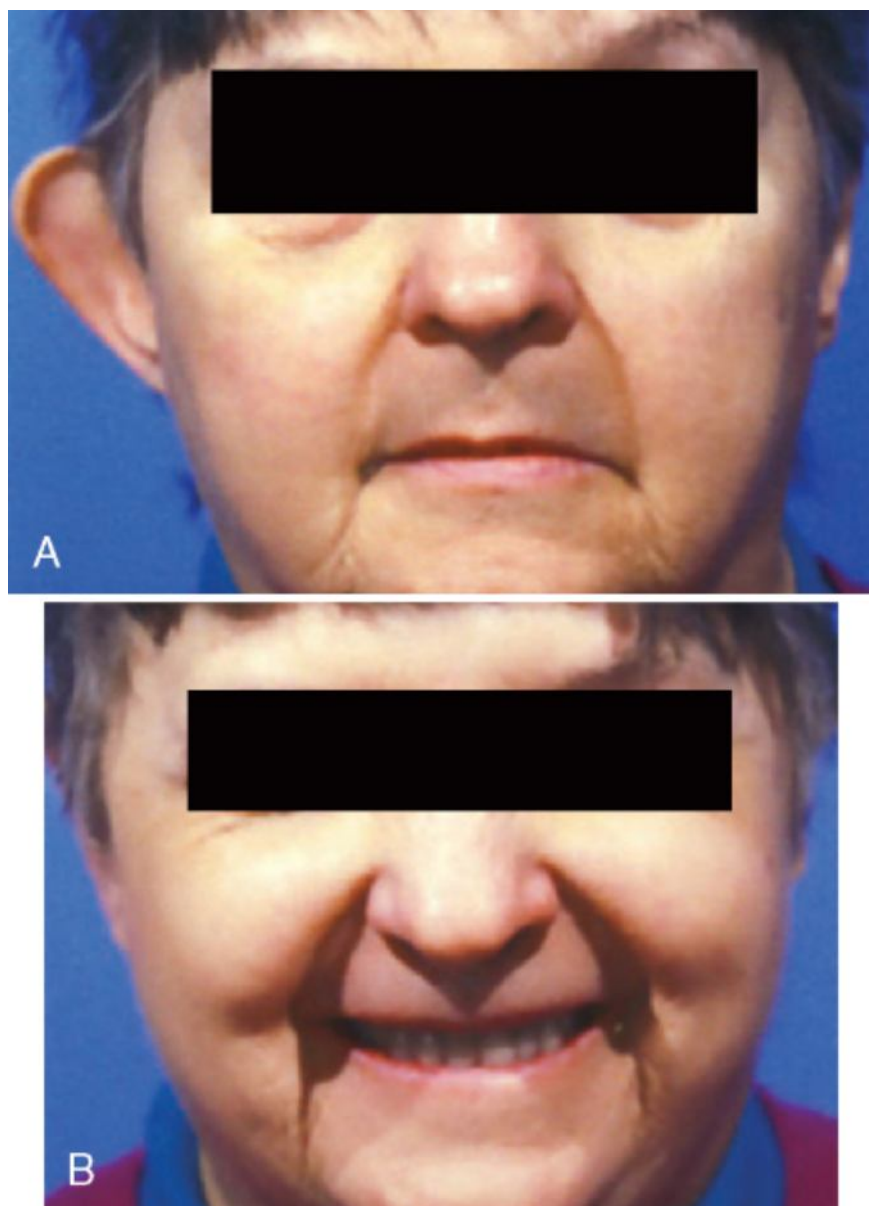


Figure 84-8 Preoperative (A) and postoperative (B) photos of a patient with a unilateral protuberant ear.

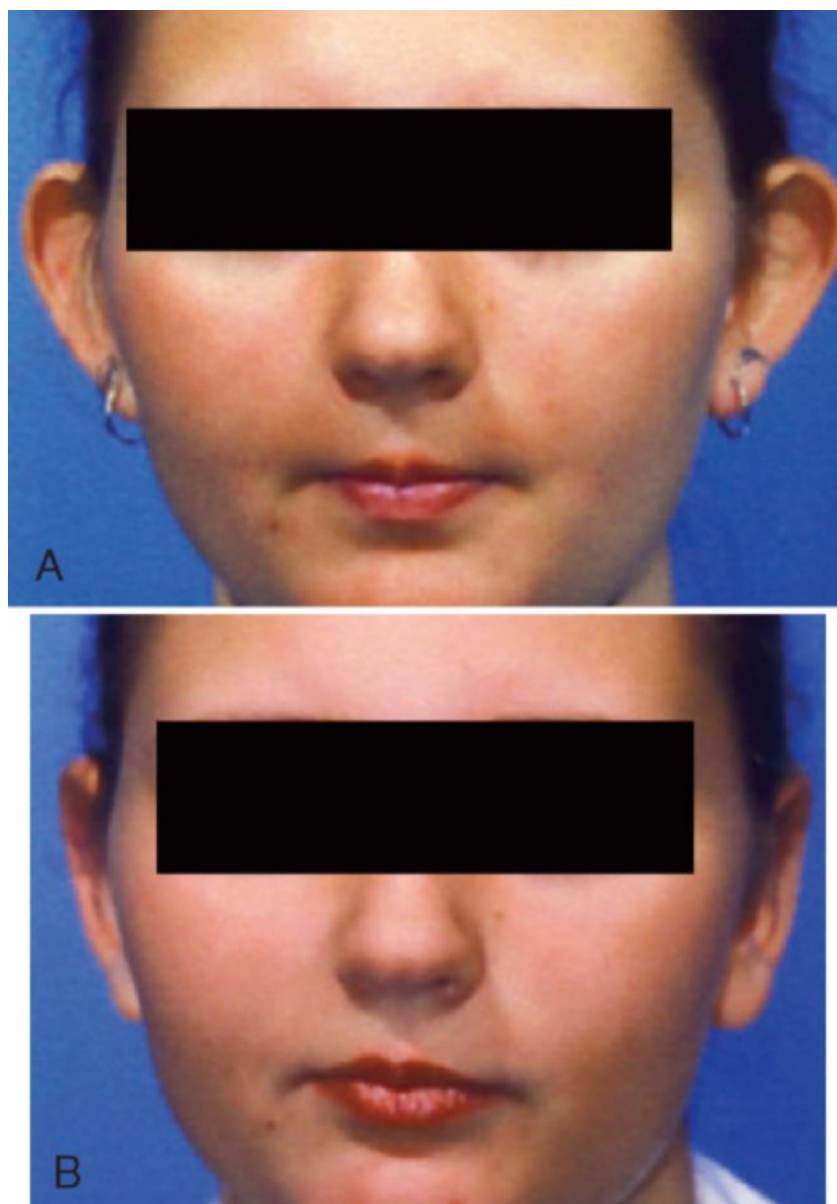


Figure 84-9 Preoperative (A) and postoperative (B) photos of a patient with bilateral protuberant ears.

COMPLICATIONS[3]

Early

Hematoma is signaled by an inordinate amount of pain, especially unilateral. Treatment includes exploration of the wound, hemostatic control, irrigation with an antibiotic solution, and closure. Untreated hematoma risks secondary cartilage necrosis and a deformed ear.

Infection usually takes 3 to 4 days to become evident. Unilateral severe pain disproportionate to the physical findings should raise suspicion. If cellulitis is present, treatment with systemic broad-spectrum antibiotics (covering gram-positive cocci and *Pseudomonas*) is warranted in an effort to prevent progression to perichondritis or chondritis, which can result in cartilage loss and an auricular deformity. Treatment of the latter, which fortunately is rare, requires surgical drainage and débridement.

Constriction/stenosis of the external auditory canal results from failure to excise the anterior portion of the conchal cartilage or from over-rotation of the conchal bowl with the setback sutures. Treatment requires excision of that portion of the cartilage.

Loss of the postauricular sulcus can result from over-resection of skin. Proper preoperative planning and incremental skin excision intraoperatively when needed will avoid this problem.

An overly compressive dressing can lead to epidermolysis/pressure necrosis of the auricular skin. Treatment

involves conservative wound care.

Late

Cosmetically unacceptable results include overcorrection, undercorrection, asymmetries, sharp unnatural contours or ridges, and gross asymmetry. All these complications are largely avoidable with proper preoperative planning and intraoperative attention to detail. Cartilage-cutting techniques (as opposed to the cartilage-contouring technique described herein) have a higher overall rate of cosmetic irregularities.

Minor asymmetry is not uncommon and should be discussed with the patient preoperatively as realistically being possible and not indicative of an unacceptable result. Gross asymmetry, on the other hand, is not acceptable. Undercorrection of the middle third of the ear as a result of untreated conchal protrusion creates a convex appearance on frontal view and requires correction with excision of the anterior portion of the conchal bowl and setback sutures. Undercorrection of the superior or inferior pole of the ear will result in a concave appearance on frontal view (the “telephone deformity”) and may require secondary revision.

Some degree of reprotrusion or suture release at the superior pole is not uncommon. Braided sutures such as Mersilene for the Mustardé mattress sutures are less likely to release than a monofilament suture material. Patients should be forewarned of this possibility. If minor, the patient is still frequently sufficiently pleased with the overall result that no treatment is necessary. If significant deformity develops, revision may be necessary.

Hypertrophic scarring/keloids can occur, but well-planned incisions and tension-free closure may help prevent this complication from developing. If hypertrophic scarring or keloids are noted early, intralesional triamcinolone (Kenalog) injections every 3 to 4 weeks may control the problem. Otherwise, excision and serial steroid injections may be required.

PEARLS

- Preoperative evaluation of the patient should establish the cause of the deformity (absence of an antihelical fold, a deep conchal bowl, or both), which guides the operative plan.
- It is important to establish proper expectations preoperatively, particularly with respect to the potential for minor persisting asymmetry postoperatively. Document and photodocument.
- The amount of skin excised should facilitate the auricular setback but not obliterate the postauricular sulcus.
- Mustardé sutures should be tightened to create a smooth, natural-appearing antihelical fold.
- Setback sutures (conchomastoid and scaphoid) can further assist in retrodisplacing the ear without having to excise more skin or cartilage.

PITFALLS

- Failure to plan appropriately or establishing inappropriate expectations is the precursor of most complications.
- Overexcision of postauricular skin can lead to overcorrection (and obliteration of the postauricular sulcus), which can be more difficult to address than undercorrection.
- Overtightening of the Mustardé sutures can create a ridge-like appearance that is unnatural and displeasing to the patient.
- Incomplete hemostasis at the time of closure can predispose to hematoma, infection, and subsequent cartilage necrosis.
- Unilateral severe or disproportionate pain may be indicative of skin necrosis, hematoma, or infection and requires prompt visual examination of the patient.