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ORIGINAL ARTICLE FACIAL SURGERY

# Aesthetic Otoplasty: Principles, Techniques and an Integrated Approach to Patient-Centric Outcomes

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**Abstract**

*Background* Otoplasty is a century-old procedure that, through continued modifications, now has over two hundred different procedures described in the literature. In this article, we seek to describe the anatomy and principles of aesthetic otoplasty, as well as some of the key contributions to aesthetic otoplasty. This article will also outline some of the most commonly used techniques today and associated patient outcomes.

*Methods* We present a review of the literature of relevant anatomy, pathophysiology and common techniques and outcomes. We also provide a discussion of several patients with associated techniques and outcomes.

*Results* The treatment of prominent ear has developed through manipulation and experimentation. The outcomes are defined by the native anatomy, the surgical technique and the attention to patient-centered outcomes.

*Conclusion* Aesthetic otoplasty remains one of the most important surgical techniques and common procedures in plastic surgery. Using an integrated approach guided by known principles as well as patient goals allows for optimal outcome in aesthetic otoplasty.

*Level of Evidence V* This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors www.springer.com/00266.

**Keywords** Minimally invasive plastic surgery · Aesthetic otoplasty · Patient-centered plastic surgery · Scaphomastoid sutures · Perichondrio-adipo-dermal flap technique · Incisionless otoplasty · Patient-centric outcomes

## Introduction

Prominent ears are a relatively common auricular deformity. The aesthetic and psychological sequela of this deformity can be profound. This article reviews the relevant anatomy, key contributions and surgical principles of otoplasty. The variety of treatments and techniques reveal the complexity of this deformity. Herein, we present a review of the literature and describe our integrated approach with patient examples and outcomes.

### The Adult Auricle, "Normal" Ear

The dimensions of the normal ear include length of the adult auricle of approximately 5.5–6.5 cm, while the width is normally 50–60% that of the length (Fig. 1). Projection is measured at 1–1.2 cm from the scalp in the superior third of the helical rim, 1.6–1.8 cm from the scalp at the midpoint of the helix and 2–2.2 cm at the lobule (Table 1) [1–3]. The auricle develops quickly after birth: 85% of vertical ear growth occurs by the third year of life, while 90% of the adult width occurs within the first year of life (Fig. 2). Vertical growth reaches 93% and width reaches 97 to 99% by 10 years of age [1, 4, 5]. Because of early growth and social implications, most procedures are performed between 5 and 7 years [1].

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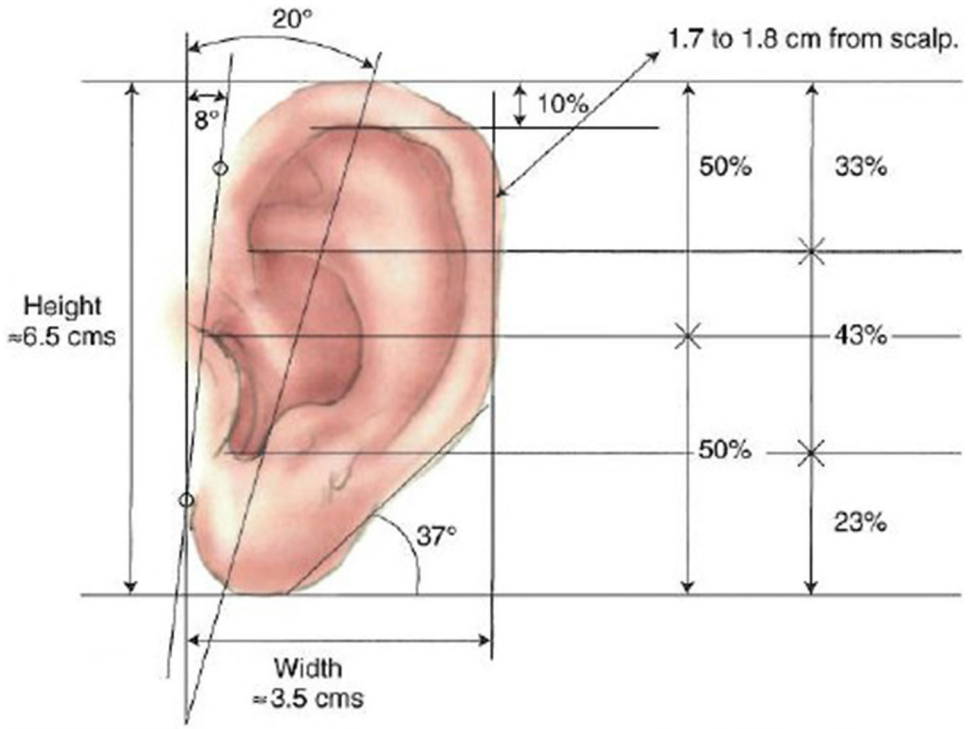


**Fig. 1** Normal auricular measurements

**Table 1** Normal proportions of an aesthetic ear

| |
|---|
| The long axis of the ear inclines posteriorly at no greater than a 20° angle from the vertical plane |
| The ear is positioned at approximately one ear length (5.5–6.5 cm) posterior to the lateral orbital rim between horizontal planes that intersect the eyebrow and columella |
| The width is approximately 50–60% of the length (width, 3–4.5 cm; length, 5.5–6.5 cm) |
| The anterolateral aspect of the helix protrudes at an angle no larger than 35° from the scalp |
| The anterolateral aspect of the helix measures approximately 1–1.2 cm from the scalp in the superior third of the helical rim, 1.6–1.8 cm from the scalp at the midpoint of the helix and 2–2.2 cm at the lobule (although there is a large amount of racial and gender variation) |
| The lobule and antihelical fold lie in a parallel plane at an acute angle to the mastoid process |
| The helix should project 2–5 mm more laterally than the antihelix on frontal view |

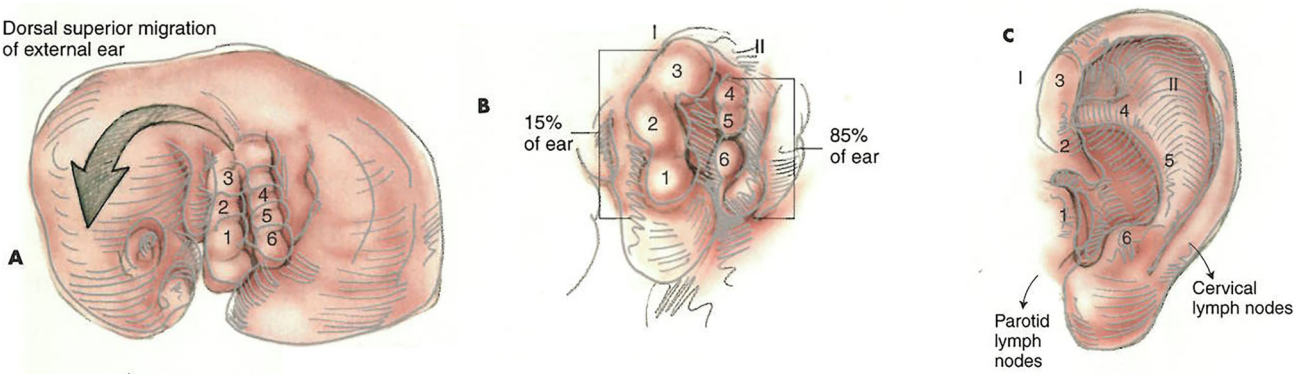


**Fig. 2** Embryology and anatomy of the external ear and landmarks

### Prominent Ear

Ears are considered prominent when they protrude more than 20 mm and at an angle greater than 35° from the occipital scalp though there may be personal and ethnic influences on individual preferences [4, 6, 7]. Incidence has been reported as low as 11 per 10,000 to as high as 47% of all births [5]. Frequency is thought to be approximately 5% of Caucasian population, and a positive family history may be seen in 59% of affected individuals with transmission in an autosomal dominant pattern with variable penetrance [4].

A general assessment of the auricles noting asymmetries and irregularities should follow, with evaluation of the helix for contour deformities and to assess its prominence at the superior pole, mid-portion and just above the lobule. The ideal corrected distance suggested by Tanzer was 1.7 cm from mastoid to helical rim, though the upper limit of normal projection is accepted at 2 cm [1, 8]. The antihelix should form a 75° to 105° angle between the scaphoid fossa and the concha. Often, one deformity seen in prominent ears is an underdeveloped antihelix at a greater than 90° angle, with a prominent lateral projection of the conchal bowl. The lobule should be examined, and the lateral margin of the lobule should lie along the plane of an appropriately positioned helix. The lateral conchal wall may extend excessively and can cause excessive lateralization of the helix and antihelix despite appropriate antihelical folding. Cartilage flexibility should be assessed and determined as stiff versus normal versus weak.

Through further evaluation, the concha can be thought of as a three-tiered four-plane structure, with the helix oriented in the *z* plane, the scapha antihelix in the *x*/*y* plane, the conchal wall in the *z* plane and the conchal floor in the *x*/*y* plane (Fig. 3). This conceptual framework allows the surgeon to consider moves in different planes to address the specific anatomic anomalies of the patient.

## Methods

A review of the literature was performed to examine the plethora of treatment options and surgical techniques available when considering otoplasty in a patient. PubMed and Embase databases were searched for the following terms: "surgical otoplasty," "evidence-based approaches to otoplasty," "otoplasty techniques," "patient-centered outcomes in otoplasty," "non-surgical otoplasty," and "reconstructive otoplasty." Subsequent searches were performed to derive detailed evidence for the techniques presented herein as well as clinical outcomes. Additionally, the pathophysiology of the prominent ear was considered in our search.

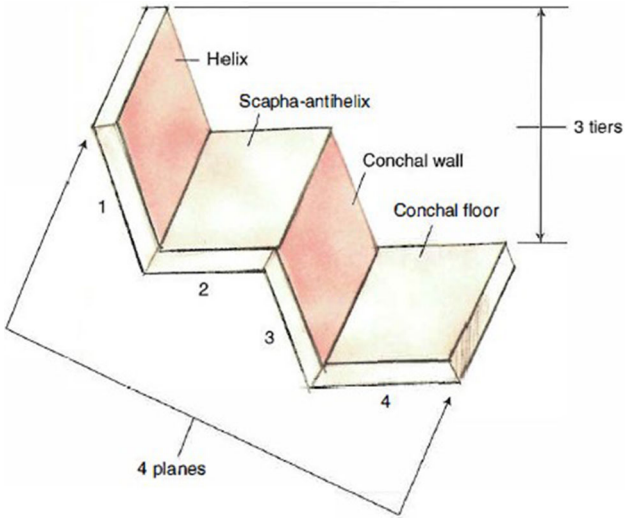


**Fig. 3** Four-plane, three-tier concept of auricular design. (1) Conchal floor; (2) posterior conchal walls; (3) scapha–antihelix complex; and (4) helix

## Results

### Pathophysiology

The etiology of the prominent ear is thought to be due to several key factors. Matsuo theorized that the high level of circulating maternal estrogens in neonates makes the auricular cartilage soft and malleable [9]. Consequently, the force of a weak posterior auricular muscle can be overpowered by forces in the intrinsic muscles of the anterior surface of the ear. As estrogen levels diminish, the cartilage acquires more elastic resilience and a more retentive memory, and the shape of the cartilage is altered permanently [9, 10]. Rogers has reported a familial tendency to prominent ears, and other auricular deformities and syndromic malformations are well documented [11].

The most common findings in protrusion of the external ear include a valgus deformation of the concha with a cranioauricular angle greater than 40°, under folding of the antihelix, and rarely, hypertrophy of the concha [12, 13]. Some think that the posterior auricular muscle, through its insertion into the ponticulus, the cranial surface of the concha, may pull the auricle back toward the head. Guyuron showed that a proximally (anteromedially) displaced insertion site decreases the length of the effective momentum of the muscle, leading to protrusion of the auricle [14].

Observationally, patients with prominent ears have an underdeveloped or flat antihelix, an overdeveloped deep concha or both. These features can be exaggerated by a prominent mastoid process, protrusion of the lower auricular pole (cauda helicis, lobule, cavum concha), or a prominent, tipped upper auricular pole.

### Non-surgical Interventions

Non-surgical interventions are an option, especially if performed early on. These were reported early by Kurozumi and Matsuo with good results if performed in the first 6 weeks of life [9, 15]. Importantly, only one-third of defects will self-correct within the first week of life and molding must be started within the first 2 to 3 weeks of life to have good outcomes [2, 4, 5, 9, 12, 16].

### Otoplasty Candidates

Many authors have noted the psychological effects of protruding ears [1, 17, 18]. Recent studies have examined the ideal timing for otoplasty and suggest it should be performed before 4 years of age as otoplasty has been shown to improve quality of life in children, which has been validated through both the Glasgow Children's Benefit Inventory and the Pediatric Quality of Life Inventory [19, 20]. Assessment should focus on age of the patient as prominent ears typically do not affect a child's self-image until they are older than 5 or 6 years, surgery is best performed prior to this age. Patients often present as referrals from pediatric primary care doctors, or late as adults seeking otoplasty for aesthetic purposes.

Caution should be granted in patients with unrealistic expectations those who are unable or unwilling to cooperate with postoperative care. Also, surgeons must be alert to the occasional adult who magnifies the severity of a small defect or who sees serious deformity in ears that most others would judge as being normal or symmetrical [21, 22].

### Surgical Management

Surgical techniques are roughly broken into three categories, sculpting (through incision or scoring of the cartilage), suturing or combination of both methods (Table 2) [23–30]. Goals should include correction of protrusion, with visibility of helix and antihelix, achievement of a smooth antihelical fold, an undisturbed postauricular sulcus and the avoidance of plastered down look or a sharp antihelical fold (Table 3).

### Historical Techniques

The first to describe an operation for repair of the ear was Ely in 1881 [31–33]. The procedure was described as a continuous, crescentic resection of a strip of cartilage and a conchomastoid fixation suture in order to correct bilateral prominent ears. Later, Luckett [24] assumed that the deformity of the ear was due to underdeveloped or unfolded antihelix and proposed a posterior surgical approach and skin–cartilage excision technique. Luckett [24] combined the skin–cartilage excision with horizontal mattress sutures to achieve better formation of the scapha. In contrast, Becker published in 1952 his technique with only a single incision along the antihelical rim and was able to achieve in combination with posterior mattress sutures aesthetic and successful shaping of the antihelical fold [34, 35]. With this advent in aesthetic otoplasty, Giba demonstrated that cartilage that is incised on only one side could warp to the opposite side [36]. The popularization of this phenomenon became the starting point for modern scoring and incision otoplasty techniques.

Most notably, Converse in 1955 described performing incomplete cartilage incisions from the posterior in combination with several fixation sutures as performed by his predecessors [37–39]. In contrast, Mustarde [40] proposed molding the antihelical fold with horizontal mattress sutures in a popularized technique that is still widely performed and manipulated today. Furnas in 1968 proposed a conchal–mastoid suture for large concha, and then Stenstrom proposed a postauricular approach with cartilage scoring in 1978 [27, 41]. In subsequent years, many surgeons modified these techniques, and most influential was Spira who modified the Furnas technique in 1985 by adding a flap of conchal cartilage sutured to the periosteum [7, 42].

Over the years, several surgical techniques have proven effective in the correction of prominent ears, most notably the incision–suture technique described by Converse, the incision technique described by Stenstrom and the suture technique described by Mustarde [27, 38, 40]. In addition to the various techniques available for correction of the prominent ear, several procedures are also available for fixation of the lobule, cavum reduction or cavum rotation

**Table 2** Otoplasty techniques can be separated into three main categories—sculpting, suturing or combination techniques

| Cartilage invasive (sculpting) | Cartilage sparing (suturing) | Combination techniques |
|---|---|---|
| Stenstrom [27] | Mustarde [40] | Cihandide [55] |
| Weerda [29] | Furnas [41] | Ersen [63] |
| Walter [28] | Spira [7] | |
| Pitanguy [25] | Scaphomastoid [53, 54] | |
| Luckett [24] | | |
| Négrevergne [30] | | |

**Table 3** Basic goals of otoplasty

| |
|---|
| All upper third ear protrusions must be corrected |
| The *helix* of both ears should be visible beyond the antihelix from the anterior view |
| Achievement of a *smooth* antihelical fold |
| The *postauricular sulcus should be undisturbed*, and a plastered down look or sharp antihelical fold should be avoided |
| The helix to mastoid distance should demonstrate the normal range of 10–12 mm in the upper third, 16–18 mm in the middle third and 20–22 mm in the lower third of the ear |
| The position of the lateral border of the ear to the head should be within 3 mm at any point between either of the two ears |

as previously described by Furnas and more recently by Janis, Naumann and Sinno [4, 34, 43, 44]. In modern otoplasty, many of these techniques are considered and concurrently utilized to match unique patient problems. Procedure planning as such should be patient-centric, with the following presentation of otoplasty techniques matched to specific problems to aid in decision making.

## Modern Otoplasty

Modern advances in otoplasty include the identification that, with time, the cartilage thickens and becomes more resilient, so suture techniques may work in younger children, under the age of 6, but surgery may often be required in older people. Newer innovations include incisionless techniques and hydro-dissection for recreation of the antihelical fold [45, 46]. Observation that scoring one side of cartilage causes it to bow out on the scored side and contract on the other (known as the "Gibson effect") has led to the development of more minimally invasive techniques over the past several decades [46, 47].

Incisions should ideally be placed in the postauricular sulcus, and some will excise an ellipse or "dumbbell" of tissue, while others feel that redundant skin is not a common issue postoperatively. Many will attempt the creation of antihelix and a decrease in the conchoscaphoid angle. This is achieved through rasping the lateral side, or the medial side if used in conjunction with Mustarde sutures. Mustarde sutures are usually placed as a row of horizontal mattress sutures from concha to scapha to recreate antihelical fold; many use nonabsorbable sutures, though PDS has been reported and the sutures are thus tightened to create a 90° conchoscaphoid angle [40].

Conchal reduction may also be achieved through a variety of suturing and excisional techniques [41, 48, 49]. The goal is to reduce the depth of the conchal bowl by decreasing the height of the back wall (i.e., the anterior wall of the antihelical fold). Excision can be done through either anterior or posterior approaches, and conchal–mastoid sutures (C–M sutures) can be placed. These are horizontal mattress sutures that lower or flatten the protruding concha, diminishing the distance between the conchal rim and the mastoid area and they pass from the posterior conchal wall to the mastoid periosteum and fascia (Fig. 4).

Fossa–fascia sutures may be useful for treatment of a prominent upper pole. Occasionally, the upper pole of a prominent ear is so exaggerated that the usual combination of Mustarde and C–M sutures is inadequate. In such situations, anchoring to the mastoid fascia and the deep temporal fascia may be required. One adverse effect is an inconspicuous effacement or elevation of the superior auricular sulcus [50, 51].

## Novel Surgical Techniques

### *Prominent Ear Deformities*

Cartilage sparing techniques have become increasingly common in the past decade and make use of the Stenstrom scoring technique and portions of the Mustarde and Furnas suturing techniques [52]. Bauer et al. [48] also advocated that cartilage sparing techniques reduce conchal hypertrophy and recurrence of prominent ear defects. The undesired result in otoplasty frequently arises from excessive folding of the antihelix and a hidden appearance to the helical rim which may be avoided in cartilage sparing techniques. Furthermore, excessive attention to the antihelix typically results in the failure of surgeons to recognize conchal hypertrophy as a major component of the original conchal prominence. Hence, by correcting the underlying conchal hypertrophy alone or in conjunction with other techniques surgeons may avoid the recalcitrant prominent ear [48]. Guidelines that have been summarized earlier for the height of the antihelical fold, conchal setback and scaphoconchal distance help to ensure a reproducible and patient-centric aesthetic result [52].

A popular incision-only technique described by Walter [28] primarily consists of cartilage excisions. Following retroauricular skin incision and preparation of the dorsal aspect of the auricular cartilage, an incision is placed 5 mm along the helical rim and anteriorly placed around the auricle down to the inferior crus. Below the inferior crus,

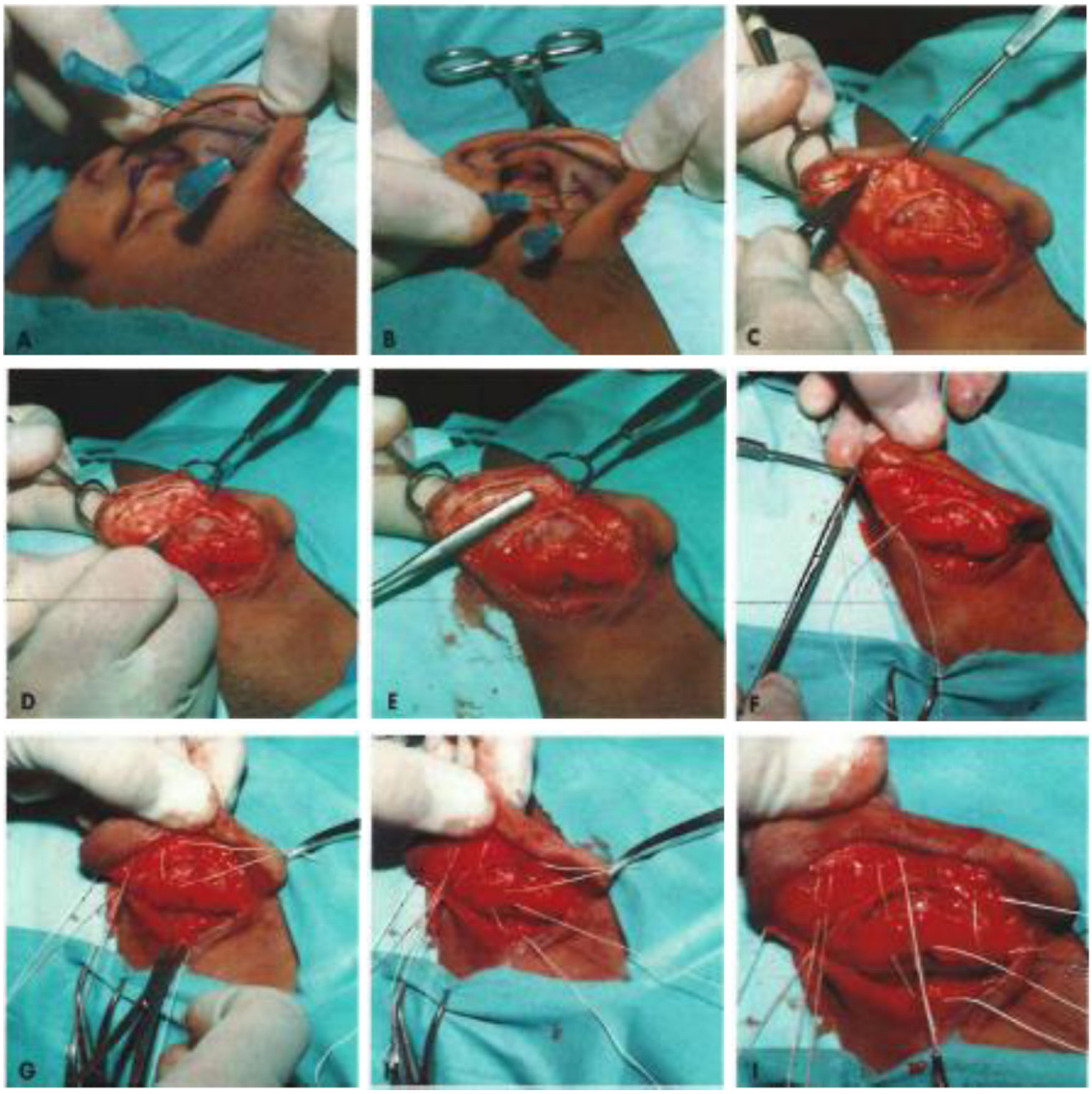

**Fig. 4** Operative sequence. **a** Needles placed to delineate posterior border of antihelix. **b** Needles placed to delineate superior crus of antihelix. **c**, **d** Incisions are made through the cartilage of the proposed antihelical roll. **e** Thinning of antihelical roll by means of a sharp No. 5 rasp. **f** Tubing of antihelix is achieved with 4–0 Mersilene mattress sutures starting superiorly. **g** Further placement of antihelical roll mattress sutures. **h** Placement of "conchal–mastoid inset" mattress suture. **i** Row of "5" mattress sutures placed (including tail of helix). Radial placement produces curved roll

the incision is directed toward the concha and extends below the intended antihelical position. In addition, the cauda helices are severed or partially excised to relieve tension in recreating the antihelix. If necessary, concha reductions by crescentic cartilage excision can also be performed in this plane.

The helical ligament is then incised, with great care and attention to the course of the temporal artery and vein that travel adjacent. At the base of the inferior crus and in the intertragal region, cartilage excisions are performed to reduce tensions in these areas and increase the malleability of the antihelix. Manipulation of the antihelix is then achieved by small cartilage resection, with all excessive skin excised. Following cartilage resection, percutaneous mattress sutures are placed to shape the antihelix and the crura. Walter's otoplasty technique is suitable for all types of protruding ears as well as revision procedures in the case of both overcorrection and protruding lobule or uneven antihelix [2, 28].

The scaphomastoid suture has been demonstrated as an alternative new surgical technique for prominent ear deformities [53, 54]. The surgery begins with the traditional postauricular incision on each ear under local anesthesia. The process was continued at the suprapericondrial plane. This was followed by the placement of four scaphomastoid sutures that were inserted from the posterior

aspect of scaphoid fossa to the mastoid periosteum of each prominent ear. After bleeding was controlled, the skin was closed with absorbable sutures. Although some complications were observed by the surgeon, results were extremely satisfactory for both parties. Advantages of this technique are primarily that the external ear canal is not disturbed, and thus there is no keloid formation of the external ear [53].

Another new approach for prominent ear deformities was recently introduced by Cihandide in early 2016 [55]. The distally based perichondrio-adipo-dermal flap technique coined by this study makes use of a distally elevated fascial flap that is anchored to the mastoid fascia. It simultaneously reconstructs the antihelix and decreases the conchal–mastoid angle. This procedure may be used in both children and adults, and cartilage scoring was performed routinely in adults to weaken the tissue memory and prevent recurrence of prominence. As such, only one patient in the study reported recurrence (5%), and a statistically significant difference was found between all pictures of patients on postoperative day 30 and postoperative day 90 [55].

The triangular fascioperichondrial flap technique was studied by Frascino [56] in a large patient case series. The technique involves elevating a distally based triangular flap in the superior third of the postauricular region in the subperichondrial plane, placing a Furnas C–M suture, and then placing an additional suture from the posterior portion of superior crus to the temporal fascia. This is also supplemented by scoring of anterior surface of the antihelix if needed in adult patients. The flap is folded to give the ideal shape to the antihelical fold and to medialize the upper pole. The author reported no early complications (hematoma, surgical site infection, skin necrosis), and few late complications, primarily recurrence in 7.45% of patients, suture extrusion in 4.34% and hypertrophic scar formation in 1.86%.

The author believes this technique is extremely advantageous as it allows for precise adhesion and positioning of the delicate cartilage flap which is anchored by only a single stitch. However, even though overall reported outcomes were comparable with or even better than many of the previously described techniques, the need for cartilage scoring and excision in the procedure, as well as placement of a permanent suture at the superior crus (which may result in long-term complications of suture extrusion), might be a significant disadvantage.

### *Absent Antihelical Fold*

The Négrevergne otoplasty technique is a simple method of cartilage weakening that is mainly preferred in young children to recreate the antihelical fold (under the age of 4 years old) [30]. This method is effective and extremely rapid, which is able to maintain the natural contours of the auricle by addressing the poorly developed or completely absent antihelix. This technique is versatile as it may also address an abnormally large concha or a prominent lobule. The simplicity of the Négrevergne also lends itself to being easily replicable among many surgeons.

In this technique, the surgeon should carefully drape the patient so that both ears simultaneously are on view to provide intraoperative comparison of symmetry. A deep mastoid pocket is then created to accommodate the repositioning of the conchal cup. This facilitates posterior conchal rotations, removes the postauricular tissues that may produce the excessive conchal prominence and enhances the setback by reducing conchal height [30].

### *Lobule Projection*

For aesthetic reasons, the lobule should also be considered in a patient-centered approach to otoplasty. The lobule should normally be positioned parallel to the plane of the upper one-third of the ear. Numerous retrolobular incisions and excisions have been described that function in repositioning a protruding or projecting lobule [4, 43, 57]. This is more so relevant following the creation or revision of the antihelix because the lobule often appears to protrude with antihelical manipulations. Many types of skin excisions can be performed, such as in the shape of a fish tail, a *z*-plasty or an ellipse, in combination with fat resection adjacent to the lobule [2, 43, 57].

### *Conchal Manipulation*

To achieve a reduction in height, size or shape of the concha or the cavum conchae, procedures such as cartilage excisions, double triangular cartilage excisions, cartilage-weakening scoring incision techniques, scoring techniques and suture techniques are available at the surgeon's disposal [34, 58, 59]. Theses excisions of the concha can be performed in one of two ways. The surgeon may use an anterior approach resulting in a combined skin–cartilage excision. In contrast, by using a retroauricular approach, conchal manipulation can be achieved in a skin–sparing manner.

### *"Incisionless" Otoplasty*

A common theme in modern otoplasty has been the incisionless otoplasty. Patients are prepared and draped using a head drape, body sheet and adhesive ear drapes. The pinnae are injected with lidocaine and epinephrine, with attention to proper blanching and avoiding overinjection. A 22-G hypodermic needle is then used to percutaneously score the

cartilage where the antihelical fold is to be recreated by the surgeon. Several sutures (usually 2–4) are placed percutaneously using the Mustarde horizontal mattress suture technique to recreate the antihelical fold and achieve a reduction in the conchal prominence. When the procedure is completed, the ears are cleansed with sterile saline solution and dabbed with an antibiotic ointment to prevent postoperative infection or perichondritis [46, 60].

Strychowsky and Mehta both found very few complications in their study of 19 and 72 patients (pediatric), respectively, with none reporting signs of short-term complications (infection, hematoma, skin necrosis, perichondritis or bleeding) [46, 60–62]. Incisionless otoplasty also gives adult patients a chance to correct the ear deformities that were not managed at a younger age (before the age of 4, or in the teenage years) [61]. Outcomes were favorable in the adult cohort reported by Mehta, with only one patient needing a revision [62]. Fritsch has also proven the efficacy of this technique with almost a decade of experience and positive patient outcomes [46].

Incisionless otoplasty by this technique has proven to be effective in correcting prominent ears caused by an absent antihelical fold, conchal hypertrophy or both. This minimally invasive technique also offers easy recovery with no need for long-term dressings, and outpatient advantage of incisionless otoplasty makes it a more ideal option versus open otoplasty in patients that must return to work or school as soon as possible without noticeable signs of surgical intervention [5, 46, 61].

### *Combined Approaches*

In early 2018, Ersen has reported an even more novel technique which combines the use of a perichondrio-adipo-dermal flap, posterior auricular muscle transposition and cartilage suture [63]. This study argues that a combination of these techniques draws from each of the individual strengths while ultimately reducing postoperative complications. The technique is described to first elevate the perichondrio-adipo-dermal (PAD) flap. The posterior auricular muscle is then dissected and transected from its insertion. After the placement of a C–M suture, the posterior auricular muscle was transposed, and the PAD flap was placed. Fourteen patients were treated with bilateral prominent ear deformities, and none suffered any postoperative complications. No recurrences were also noted 1 year after surgery.

The combination of these three commonly used and well-described techniques produce very reliable results and has demonstrated a decrease in postoperative complication rates. This technique also provides a primary otoplasty technique that is dependable and standardized across many patients. However, the primary limitation of this study was the very small number of patients included. Although promising, following studies are necessary to corroborate the observed decrease in postoperative complications.

## Outcomes

Generally, overcorrection is not necessary and avoided, and long-term outcomes are good in many of the otoplasty techniques described, with excellent long-term morphometric results [64]. Suture-only repair has the benefit of offering precise control but has a higher rate of relapse and need for revision [40, 65, 66]. Whereas sculpturing is more permanent, it is less predictable and can deform the shape of the ear, so many modern techniques combine both methods [13, 66].

## Discussion

The approaches summarized herein may all be utilized to approach different patient problems. The following are several patient examples and a description of the techniques utilized to address their patient-specific problems.


**Fig. 5** Preoperative (**a**, **b**), and postoperative (**c**, **d**) otoplasty results

### Pediatric Patients

Figure 5 demonstrates a young patient with bilateral prominent ear. This patient suffers from conchal hypertrophy and lack of the antihelical fold. As such, this patient benefited from a combined resection of the conchal bowl and suture-based otoplasty. The superior crus was recreated utilizing Mustarde sutures. The ear was further set back with Furnas sutures, and a tail of the helix suture was used to control the lobule.

Figure 6 demonstrates a young man who had prominent ear secondary to conchal hypertrophy on the right, and lack of the superior crus on the left (not shown). This patient underwent a combined approach of conchal bowl partial excision on the right with bilateral Mustarde suture technique at 4-year follow-up. This demonstrates longevity of the procedure over time.

### Adult Patients

Figure 7 shows recent patients all with 6-month follow-up times, each addressed with combined techniques. Panels (a) and (b) are of a patient who had a scaphal reduction with combined suture-based otoplasty; (c) and (d) show a patient who had a cymbal reduction with suture technique; and (e) and (f) show a young boy with malleable cartilage who had a composite reduction in the scapha and cymba and suture-based otoplasty. The three patients herein demonstrate a slight overcorrection of the helix, and as such one could argue that the basic goals of aesthetic otoplasty have not been met (namely—"the helix of both ears should be visible beyond the antihelix from the anterior view"). However, in this case the patients were extremely satisfied with the results. As such, it is important for the aesthetic surgeon to weigh both the overall goals of aesthetic otoplasty and the expectations of the patient, leaving both the surgeon and patient satisfied with the outcome as in this case.

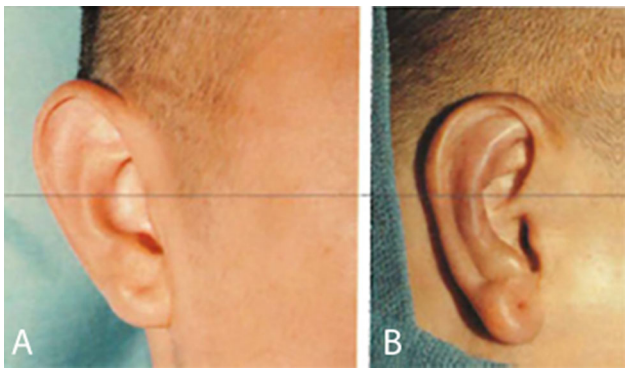


**Fig. 6** Preoperative (**a**) and postoperative (**b**) views. Note the gentle roll and no sharp edges of antihelix. Lobule is controlled with tail of helix suture


**Fig. 7** Preoperative (**a–c**), and postoperative (**d–f**) otoplasty results

In Fig. 8, an elderly patient with an aged ear requested a reductive otoplasty. To decrease the size of the lobule, a simple wedge resection of the lobe was performed. To correct this patient prominent ear, resection of a portion of the antihelix and helix was performed. The correction is shown immediately postoperatively. Older patients with prominent ears may also seek out reduction in the scapha if that is the anatomical cause of the prominent superior ear. Figure 9 shows another older patient who had a scaphal resection with helical advancement flaps and a lobe reduction immediately postoperatively.

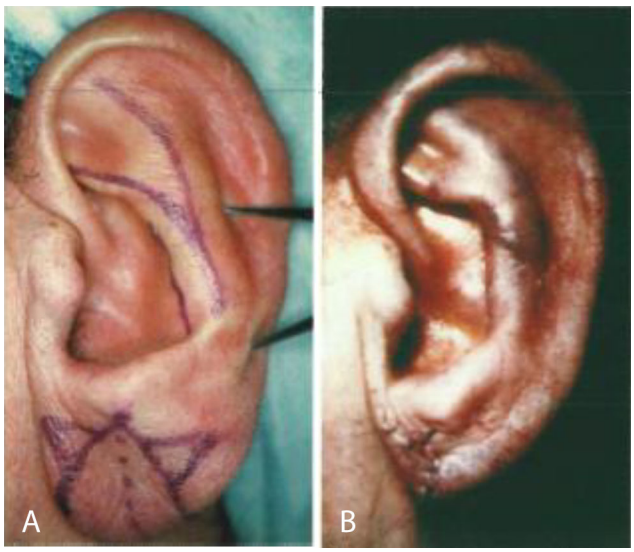


**Fig. 8** Preoperative surgical planning (**a**) and immediate postoperative views (**b**) showing correction of macrotia and composite otoplasty with wedge excision of lobule

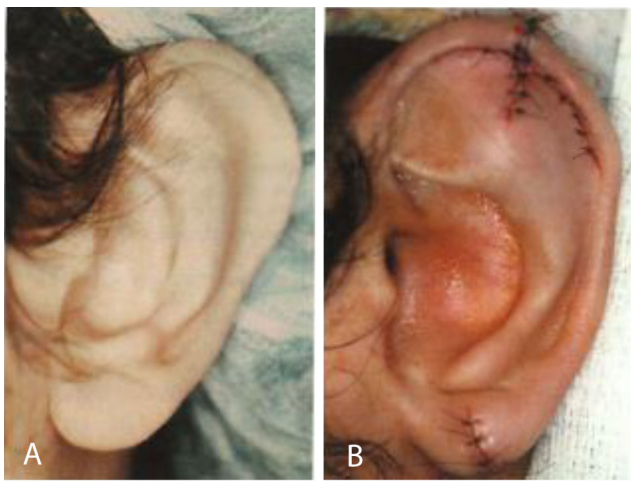


**Fig. 9** Intraoperative preoperative (**a**) and immediate postoperative (**b**) views, showing correction of shell ear deformity and macrotia. Curling of helix achieved with helical wedge-shaped and shortening of the external rim

## Conclusion

These cases all demonstrate that no two otoplasties are alike, and multiple techniques and approaches should be utilized to provide long-lasting aesthetic outcomes for these patients, with consideration of age and extent of deformity. It is also important to deliberate both the generally accepted goals of aesthetic otoplasty and the goals and expectations of the patient. As such, aesthetic otoplasty involves an integrated approach, with considerations for native anatomy, surgical technique and patient-centered outcomes.

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**Compliance with Ethical Standards**

**Conflict of interest** The authors declare that they have no conflict of interest.

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