

An Overview about Aesthetic Results and Complications in Otoplasty: Review Article

Alaa Eldin Elfeky, Wail Fayez Nasr, Saeid Abdullah Alsaedi Wafi, Ashraf Elhussiny Odabasha

Departments of Oto-Rhino-Laryngology, Faculty of Medicine, Zagazig University, Egypt

*Corresponding author: Saeid Abdullah Alsaedi Wafi, Mobile: (+20), 0 101 922 3879 E-Mail: Saeidwafi@gmail.com

ABSTRACT

Background: Otoplasty is mostly performed for cosmetic reasons, and it has been observed that people who have undergone the procedure may experience a minor reduction in their hearing compared to those who have not. The surgeon's goal should be nothing less than perfection in terms of aesthetics. Improving upon one's own efforts necessitates reflective self-analysis. Otoplasty is normally successful, and the surgeon and patient are pleased with the results, but occasionally there are complications.

Objective: assessment of aesthetic results and complications in otoplasty. **Methods:** We scoured medical publications and databases including PubMed, Google Scholar, and Science Direct for information on otoplasty, complications and management between December 1995 and February 2022. However, only the latest or most comprehensive study was considered. The authors also assessed the usefulness of references drawn from similar books. As a result, non-English documents have been overlooked due to a lack of resources to translate them. It was commonly recognized that scientific research did not include things like unpublished publications, oral presentations, conference abstracts, or dissertations.

Conclusion: Fortunately, otoplasty problems are infrequent and can usually be avoided with careful planning, execution, and follow-up care on the part of the surgeon and patient. The surgeon needs to be well-versed in potential problems, capable of providing accurate pre-operative risk assessments, and comfortable managing any hazards may develop during surgery.

Keywords: Aesthetic results, Complications, Otoplasty.

INTRODUCTION

When children have prominent ears, they may face severe emotional distress from bullying and teasing in school or kindergarten. About five percent of German adults deal with the social consequences of having large ears. Parents may choose otoplasty for their children or themselves if they are concerned about their low self-esteem, lack of confidence, or social isolation as a result of their condition ^[1].

In view of these issues, it is suggested that otoplasty be performed on children with protruding ears between the ages of 5 and 6, before they enter school. However, it is important to remember that individuals with protruding ears may not always have psychological issues, despite the compelling grounds in favour of otoplasty, at the time of examination. It's important to take into account the fact that 5- and 6-year-olds may already supply information regarding the emotional toll and social difficulties caused by prominent ears. As a result, it's not shocking that many parents want otoplasty for their kids, even when the kids themselves don't think they have any issues related to their ears ^[2].

Ethics surrounding paediatric surgery are difficult to navigate. Parents sometimes ask for help before school to "avoid teasing and bullying," but there's little evidence to suggest that doing so actually helps children cope with the emotional challenges of childhood. Others will say that kids should be old enough to make up their own minds about their hearing future ^[3].

Without a doubt, numerous unnecessary operations would result from doing surgery on all youngsters who arrived with big ears. Prominent ears may become so bothersome to some people that they require surgical correction. Some people will be unaffected in their personal, academic, or professional relationships. When

assessing a newborn with a prominent ear, it is vital to bear in mind the nonsurgical option due to the risks associated with otoplasty. When a large ear is noticed soon after delivery, splinting has emerged as a viable treatment in recent years. It is best to make these adjustments within the first 96 hours of a baby's life. However, if the baby is healthy enough in the first few weeks of life, it may be able to avoid surgery altogether. During this time, cartilage begins to harden quickly after birth since maternal estrogens are no longer present. The levels of these estrogens are highest in the first three days after birth and return to normal by the sixth week. Bone wax is a trusted material that is frequently used to shape and splint the ear, allowing for precise correction. This can be covered and held in place using surgical tape for 2 weeks ^[4].

The goal of the surgeon should be to restore the ear's natural, unaltered look. Each part of the setback should look like it belongs with the rest of the ear, creating a balanced whole ^[5]. When it's the right moment to fix prominent ears relies on things like the patient's age, the stability of the auricle's cartilage, the patient's mental state, and their own desires. An otoplasty performed when a child reaches the age of six is unlikely to have a noticeable impact on the development of the ear. If the cartilage in your ear is fragile, delicate surgical techniques can be used to reshape and re-pin your ear to its proper position ^[6].

The use of adequate auricular moulding devices in babies presenting with relevant auricular malformations has led to good to very good results in the partial repair of auricular deformities without surgery in recent years ^[7]. Otoplasty is mostly performed for cosmetic reasons, and it has been observed that people who have undergone the procedure may experience a minor

reduction in their hearing compared to those who have not. The surgeon's goal should be nothing less than perfection in terms of aesthetics. Evaluating one's own work objectively is crucial for making advancements [8].

Otoplasty is typically successful and well-received by both the surgeon and the patient, although occasionally complications arise. The best possible outcome can be achieved with meticulous preoperative evaluation of the abnormalities and meticulous intraoperative attention to detail.

The following aesthetic objectives aid in defining a successful otoplasty [8]:

1. Issues need to be identified and fixed in an appropriate manner. If both issues are present—an excessively high conchal bowl and an underdeveloped antihelical fold—they must be treated separately. Earlobe protrusion and helical irregularities are two more examples of physical flaws that need fixing.
2. A telephone ear malformation is impossible if the ear's upper and lower poles are on the same plane as the middle section. Avoid overcorrecting the upper section of the ear, since this can lead to a pasted appearance or a deformity known as reverse telephone ear. At the superior pole, the distance between the helical rim and the mastoid should be 10–12 millimeters, in the middle third, the distance should be 16–18 millimeters and at the level of the cauda helicis, it should be 20–22 millimeters. A 25° to 35° auriculo-cephalic angle is considered normal.
3. From the front, you should be able to make see the helical rim behind the antihelix.
4. The two ears should be identical in size, shape, and placement. Ear projection shouldn't exceed 3 mm in either direction.
5. From the crus, the helix should curve backwards smoothly. The lobule, with which the helix is aligned, should receive it with grace as it is furled at its superior aspect.
6. The superior crus should be slightly curved forward into the antihelix. A crease or ridge shouldn't be present, but rather a smooth roll.
7. It is important to keep the post-auricular sulcus intact.
8. There shouldn't be any bumps, scars, or ridges on any of the exposed areas [8].

The Short Assessment of Patient Satisfaction (SAPS):

The SAPS is a standard instrument for measuring the happiness of patients. It's a quick strategy that works well. It's a seven-item scale proven reliable for measuring how happy a patient is with his or her care. The seven essential elements of patient satisfaction are as follows: contentment with therapy, explanation of treatment results, clinician care, participation in medical decision-making, respect from clinician, time spent with clinician, and satisfaction with hospital/clinic care. The scales used for responses are 5-point measures. Clinical settings have confirmed the accuracy of the SAPS. Cronbach's alpha = 0.85 indicates reliability. The average patient will finish it in under a minute. Effective

feedback on the treatment's efficacy from the patient's perspective can be gained through the use of such metrics, which can also help in identifying methods to enhance practise and resolve patient concerns [9].

Unsatisfactory results:

In some cases, otoplasty may not improve hearing. It's usually possible to make significant progress, but rarely reach 100%. When the surgeon is aware of what factors contribute to less-than-desirable aesthetic outcomes, he or she can take preventative measures throughout the operation [8].

Complications of otoplasty:

Complications from otoplasty are fortunately uncommon and can typically be avoided with careful planning and execution before, during, and after the procedure. The surgeon needs to be well-versed in potential complications, able to effectively manage any that may develop during surgery, and required to properly inform the patient of those risks prior to the procedure. Early complication rates have been reported anywhere from 0% to 8.4%, and late complication rates have been reported anywhere from 0% to 47.3%. It's true that there's a wide range of articles out there, and that many of researches are only retrospective analyses of past operations by single hospitals or doctors. The greatest possible outcome requires an in-depth knowledge of the various techniques and complications by the otoplastic surgeon [10].

Table (1): Otoplasty complications [10].

Early	Late
Hematoma	Hypertrophic scar/keloids
Infection/ Perichondritis	Suture complications
Cartilage/Skin necrosis	Recurrence
	<ul style="list-style-type: none"> • Auricular deformities <ul style="list-style-type: none"> o Telephone ear/reverse telephone ear o Vertical post-deformity o Overcorrection helix o Hidden helix o Auricular ridges o Antihelical malposition/puckering o Narrowing external auditory canal meatus

Early complications:

These problems usually manifest themselves within a few hours to a few days of the surgery [10].

Post-operative Hematoma/Hemorrhage (Figure 1):

Pain after surgery is a common symptom of a hematoma and should be taken very seriously if it is unilateral or asymmetric. To prevent the terrible anatomic deformity known as cauliflower ear, which can result from wound infection, perichondritis, or chondritis, prompt exploration should be performed with the goal of emptying the hematoma and attaining hemostasis [11].

After the procedure is complete, a compressive dressing may be used to further reduce the risk of a hematoma developing. To ensure that the dressing fits snugly in the ear's nooks and crannies, the authors recommend placing xeroform dressing in the concha and inside the helix. To prevent necrosis from occurring, a glasscock dressing is put after having some of the fluffs removed. After 2 days, a headband is worn 24/7 for 3 weeks while this dressing is in place [10].



Figure (1): post-operative auricular hematoma [10].

Infection (Figure 2):

Similar to other surgical sites, infection following otoplasty often presents itself 3 to 4 days after the procedure. Infections occur between 2.4% and 5.2% of the time [12].



Figure (2): Inflammation and erythema: signs of perichondritis [10].

Sterile and thorough intra operative surgical procedure, the use of antibiotic ointment after surgery, and the provision of perioperative intravenous antibiotics can all help to lower the risk of postoperative infection. Infection manifests itself clinically as erythema, edoema, asymmetry, drainage, or excessive pain complaints out of proportion to physical findings [12].

Deformity of the auricle may result from infections ranging from simple cellulitis to more severe forms of infection like perichondritis or chondritis. Drainage and parenteral antibiotics against *Pseudomonas aeruginosa* and gram-positive organisms are necessary to treat an infection. If necrosis has set in, tissue debridement may also be required [13].

Skin and Cartilage Necrosis: Infection is a common cause of cartilage necrosis, and the resulting perichondritis is unpleasant. Auricular deformity is a

common effect, and necrotic cartilage may need to be removed to get rid of the infection and stop the deformity from getting any worse. Surgical errors and careless handling of skin and other soft tissues are the most common causes of skin necrosis. Overly aggressive cauterization, insufficient surgical dissection, disruption of the subdermal plexus' blood supply, and inappropriately snug bandages are the most frequent causes. The most typical complaint is excessive pain following surgery; treatment is the same as for hematoma, with the optional addition of skin grafting if too much cartilage is exposed [10].

Late complications:

Complications that arise weeks or months after surgical operation are considered late. They develop more subtly and, without close monitoring, are easier to miss [10].

Keloid and Hypertrophic Scarring:

Hypertrophic scarring is more likely to occur in people with darker skin tones who also have a personal or family history of the condition. If a keloid develops, it needs to be treated the same way it would be in any other part of the body. Excision, radiation, or pressure dressings may be necessary for more severe or refractory scarring, however intra-lesional triamcinolone (40 mg/mL) injection may be used to minimise the volume of hypertrophy [14].

Suture complications:

Otoplasty can have a variety of suture difficulties, the nature of which mostly depends on the suture material. Most methods for reducing the prominence of the conchal bowl involve the application of non-absorbable sutures to sculpt a new antihelical fold, as described by surgeons like **Furnas and Mustardé** [10].

With regard to pinna position and cosmetics, the timing of suture removal can be crucial in the event of infection or granuloma. Recurrence of the initial malposition can be prevented by waiting several months after the infection has subsided and the soft tissues have healed and scarred [10].

Hypoesthesia:

The external ear receives most of its sensory innervation from the great auricular nerve. Paresthesia or sensory loss can occur if the nerve or one of its many branches is injured during otoplasty. Most of these problems will get better on their own, but occasionally people report lasting sensory issues. Patients frequently report a diminished sensitivity to temperature, which can be an issue in cold weather when it makes them more vulnerable to frostbite. Patients should be advised to adopt necessary safety measures [10].

Loss of Correction:

The incidence of this consequence is relatively high, between 6.5% and 12%. The procedure utilised to fix prominent ears has the most impact on the degree of corrective loss [8].

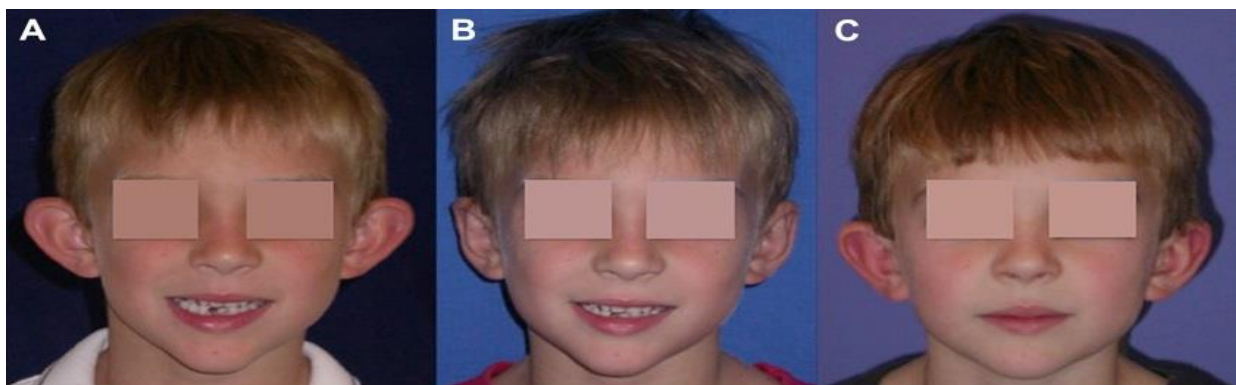


Figure (3): Recurrence: (A) Pre-operative photographs; (B) 2 months post-op; (C) 6 months post-operative [10].

There will be more recurrences with cartilage-sparing methods than with cartilage-cutting or -contouring methods. The recurrence rate is higher for procedures that remove only the skin, such as excision. Failure to overcorrect during surgery, faulty suture placement (resulting in greater tension and a "cheese wire" effect across the cartilage), and improper suture placement (resulting in improper suture placement) are all contributors to recurrence. A full thickness cartilage bite into the anterior perichondrium is required prior to the insertion of mattress sutures. The "cheese wire" effect through the cartilage is another potential outcome of poor implantation. Cartilage in some patients may have a high degree of resilience and memory retention. Loss of correction could occur within a few months if this isn't addressed with additional methods like scoring. Sutures can be pulled through and the healing process can be thrown off by trauma sustained after surgery [8].

Patient dissatisfaction:

Patients must be carefully selected, and they must receive thorough pre- and post-operative counselling, just as they would for any other invasive operation. It is important to inform patients that the pinna's position may not be maintained immediately following surgery, and that further treatment (including reoperation) may be required to obtain the desired outcome. It's important to consider potential problems and discuss them [10].

Technical complications:

Telephone Ear Deformity/Reverse Telephone Ear Deformity

When the conchal bowl is over-resected and/or the centre portion of the ear is over-corrected with mattress sutures, the result is a malformation known as "telephone ear". Telephone ear can also be caused by excessive removal of skin from behind the ear. The telephone ear may also result from lobular hypertrophy that was not diagnosed before surgery. When the middle third of the ear is overcorrected while the upper and bottom thirds are undercorrected, the result is reverse telephone ear [14].

Vertical Post-deformity

When the superior Mustardé mattress suture is poorly placed, it forms a vertically oriented superior crus instead of a gradual curvilinear arc that resembles the

curve of the helix, leading to a post-deformity. Because this abnormality can be seen with direct visibility during surgery, it is best prevented right away [10].

Overcorrection and the Hidden Helix

Occlusion of the post-auricular sulcus and a stuck-down look of the ear are common results of very aggressive conchal excision. To prevent taking off too much skin from the inner third of the ear, the skin is removed in the shape of a dumbbell. If the antihelix is overcorrected, the helix will be hidden from frontal view, although the ideal contour would have the helix visible to the naked eye from a distance of a few millimeters [10].

Auricular Ridges

Most commonly, auricular ridges are the result of cartilage scoring or excision, which leaves the antihelix looking sharp or jagged. Destabilizing the auricular cartilage via cartilage cutting can cause significant step-offs as the cartilage heals under new tensional pressures. These more forceful methods should be used with care, and saved for the most resistant cartilages [10].

Antihelical Malposition/Puckering

Recreating the soft curvature of the aesthetic antihelix in the prominent ear is crucial for a satisfactory result [15].

To prevent an excessively acute fold, the Mustardé mattress sutures should run parallel to the cartilage and perichondrium while remaining subdermal and spaced at least 7 mm apart. When marking the ear with a marker and a needle soaked in methylene blue to indicate the underlying cartilage, the exact site of the sutures can be prepared for after the skin has been elevated post-auricularly [10].

Narrowing of External Auditory Canal Meatus

Because adult cartilage is typically thicker and less pliable, iatrogenic meatal stenosis, a potentially fatal complication of otoplasty, is more common in adults. Over-rotation of the conchal bowl during placement of set-back sutures might lead to canal narrowing. To keep the canal from becoming too small, the concha should be pushed posteriorly with the help of concho-mastoid sutures. In addition, the conchal cartilage is shaved behind the external auditory canal to allow for more retro displacement of the ear. If this problem arises, the canal's patency can be restored by removing extra

cartilage using either the anterior or posterior approach [17].

Secondary Otoplasty:

Under or over adjustments can lead to undesirable outcomes, including possible permanent deformation of the underlying cartilage framework. Reconstructive issues such as overcorrection and cartilage deformation are not uncommon [14].

The most common suggested reason was a return to prominence. It was the primary treatment for almost 60% of patients who had undergone posterior suturing, with another 10% having uncorrected hypertrophy conchal bowl. Only 38% of the instances were found to have prominence when anterior grading was completed. Compared to more than 60% of anterior scoring instances, most of which comprised of deformation of the scaphoid fossa, only about 25% of posterior suturing cases presented with "irreversible" damage necessitating extensive repair. Antihelix, superior crus, concha, and lobule diagnoses are first line of defence against under-correction and recurrence. Secondary otoplasty with posterior sutures or conchal cartilage removal was effective in most cases. For severe cases of deformity and overcorrection, a combination of skin flaps and cartilage grafts may be necessary to restore the ear to its natural form [18].

CONCLUSION

Fortunately, complications from otoplasty are uncommon and may usually be prevented with meticulous pre- and post-operative care. The surgeon must be familiar with probable complications, proficient in delivering accurate preoperative risk assessments, and confident in handling any issues that arise during the operation.

Sponsoring financially: Nil.

Competing interests: Nil.

REFERENCES

1. **Sheerin D, MacLeod M, Kusumakar V (1995):** Psychosocial adjustment in children with port-wine stains and prominent ears. *Journal of the American Academy of Child & Adolescent Psychiatry*, 34 (12): 1637-1647.
2. **Jović D, Preradović L, Guzijan A (2021):** Otoplasty: a modified Chong-Chet technique with positive long-term results. *Medicine*, 100 (42): 27554. doi: 10.1097/MD.00000000000027554
3. **Stewart K, Lancerotto L (2018):** Surgical otoplasty: an evidence-based approach to prominent ears correction. *Facial Plastic Surgery Clinics*, 26 (1): 9-18.
4. **Gault D (2010):** Commentary on: Complications of otoplasty: a literature review. *Journal of Plastic, Reconstructive & Aesthetic Surgery*, 63 (2): 235-237.
5. **Thorne C, Wilkes G (2012):** Ear deformities, otoplasty, and ear reconstruction. *Plastic and Reconstructive Surgery*, 129 (4): 701-716.
6. **Haytoglu S, Haytoglu T, Bayar Muluk N et al. (2015):** Comparison of two incisionless otoplasty techniques for prominent ears in children. *International Journal of Pediatric Otorhinolaryngology*, 79 (4): 504-510.
7. **Zhu Y, Zhou Y, Zhao Q et al. (2021):** 3D Technique-Based Nonsurgical Correction of Deformational Congenital Auricular Deformities. *Journal for Oto-Rhino-Laryngology and its Related Specialties*, 83 (2): 59-64.
8. **Elmelegy N (2022):** Prominent Ear Correction Using Full-Thickness Cartilage Strip: An Incomplete Cutting Technique. *Annals of Plastic Surgery*, 88 (2): 180-187.
9. **Hughes R (2008):** Tools and Strategies for Quality Improvement and Patient Safety. In: *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville (MD). Agency for Healthcare Research and Quality (US). <https://www.ncbi.nlm.nih.gov/books/NBK2682/>
10. **Handler E, Song T, Shih C (2013):** Complications of otoplasty. *Facial Plastic Surgery Clinics*, 21 (4): 653-662.
11. **Zanin E, Maximiliano J, Oliveira A et al. (2021):** Otoplasty: Rasps or Puncture Needles? A Clinical Trial. *Aesthetic Plastic Surgery*, 45 (2): 521-527.
12. **AlAwadh I, Alassiry H, Bogari A et al. (2022):** Complication Rates From Otoplasty at a Tertiary Facial Plastic Surgery Center: A Retrospective Analysis. *The Journal of Craniofacial Surgery*, 33 (6): 1813-1815.
13. **Limandjaja G, Breugem C, Mink van der Molen A et al. (2009):** Complications of otoplasty: a literature review. *Journal of Plastic, Reconstructive & Aesthetic Surgery*, 62 (1): 19-27.
14. **Lentz A, Plikaitis C, Bauer B (2011):** Understanding the unfavorable result after otoplasty: an integrated approach to correction. *Plastic and Reconstructive Surgery*, 128 (2): 536-544.
15. **Punj P, Chong H, Cundy T et al. (2018):** Otoplasty techniques in children: a comparative study of outcomes. *ANZ Journal of Surgery*, 88 (10): 1071-1075.
16. **Naumann A (2007):** Otoplasty—techniques, characteristics and risks. *GMS Curr Top Otorhinolaryngol Head Neck Surg.*, 6: 1-14.
17. **Myers E (2008):** Operative Otolaryngology: Head and Neck Surgery E-Book. Elsevier Health Sciences. Pp: 968. <https://www.us.elsevierhealth.com/operative-otolaryngology-9780323401500.html>
18. **Szycha P, Orfanotis G, Stewart K (2012):** Revision otoplasty: an algorithm. *Plastic and Reconstructive Surgery*, 130 (4): 907-916.