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INTEGRATED STUDY MASTER'S THESIS

Prominent Ears Deformity: Causes, Classification, Correction Techniques and Complications

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1. Summary

Background: Prominent ears are a common congenital abnormality. While not causing any functional impairment, the condition might lead to substantial psychological distress. A variety of correction methods is available. These procedures include non-surgical techniques for infants and surgical techniques for older patients.

Objective: This literature review summarizes the etiology, classification, psychosocial implications, treatment procedures, complications, and ethical and cultural considerations regarding prominent ears.

Methods: A systematic literature search was conducted, including PubMed, Google Scholar, ScienceDirect, and NCBI Bookshelf. Additionally, authoritative speciality sites were included gather clinical insights and recent guidelines. The search was limited to publications in English language, published between 2000 and 2025. To ensure relevance, articles within the last 10 years were specifically focused.

Results: Prominent ears deformity is a congenital condition. The most frequent anatomical causes include antihelical fold deficiency and conchal hypertrophy. Ear molding is effective in neonates, while established surgical procedures, especially Mustardé, Furnas, and Stenström techniques, remain standard for older patients. Complications are generally manageable and rare. Correction of prominent ears can enhance psychological well-being in children and adults.

Conclusion: The correction of prominent ears can significantly improve self-esteem, patient satisfaction, and quality of life, especially in children. An individualized, age-related treatment approach is necessary to achieve optimal results. The Mustardé, Furnas, and Stenström/ Chongchet techniques are the most widely used otoplasty procedures. Modern innovations and early intervention improve aesthetic and emotional outcomes.

Keywords: Prominent ears, antihelical fold, conchal hypertrophy, ear molding, otoplasty, psychosocial impact, ear surgery

2. INTRODUCTION

2.1 DEFINITION

Prominent ear deformity is one of the most prevalent congenital abnormalities. It is also called otapostasis, protruding ears or bat ears and is characterized by an increased projection of the auricle from the side of the head. In the majority of cases, the abnormality is innate and affects both ears (1). The condition itself does not directly cause any functional problem but may be a source of psychological distress, especially in children (2). The form and position of the ears has different aesthetic and cultural connotations. Protruding ears are considered a sign of good luck in some cultures, whereas others consider them a cosmetic imperfection (3).

The external ear, or auricle, has a complex architecture, composed of skin and cartilage. In protruding ears, the anatomy of the external ear is changed, leading to an increased projection from the side of the head. In most cases, this protrusion is caused by developmental deviations of the auricle´s cartilage during foetal growth. Different causative factors have been described, and genetic factors seem to play a major role (4). Several anatomical factors, including an underdeveloped antihelical fold, an enlarged conchal bowl, or excess cartilage in the conchal region, may be the cause of otapostasis. Often, a combination of these factors leads to the development of prominent ears (1).

A variety of surgical procedures, collectively defined as otoplasty, have been developed to reshape the external ear, achieving a more typical appearance. Overall, otoplasty can be regarded as an effective and safe procedure (5), but as with any surgical intervention, a variety of complications may occur. For surgeons as well as patients it is crucial to understand these complications to ensure informed decision-making and adequate postoperative care.

In most cases, protruding ears are already present at birth, and about 5% of the Caucasian population is affected (6). While the abnormality itself does not cause functional issues, the psychological and social aspects can impact self-confidence as well as social interactions (2). By early recognition and intervention, these effects can be mitigated, which highlights the crucial role of healthcare providers. It is important to understand the causes, classification, psychological impact, correction techniques, potential complications, and cultural as well as ethical considerations associated with prominent ears to support affected individuals, improving their aesthetic outcomes and overall quality of life.

2.2 IMPORTANCE OF STUDYING PROMINENT EARS

Understanding prominent ears has not only medical and aesthetic, but also psychosocial importance. Ears significantly influence facial aesthetics. If the appearance of the external ear varies from norms, an individual may be dissatisfied with it. While some individuals may see their protruding ears as a unique characteristic, others might seek improvement of their self-esteem through surgical procedures.

According to studies, children with prominent ears are at a high risk of being bullied and teased, potentially causing psychological consequences such as anxiety, social withdrawal, and reduced self-esteem (2).

Early intervention is very important to reduce the psychological impact of prominent ears (7). Especially children who face bullying or social stigma can benefit (2). Adults with prominent ears may experience self-image concerns affecting their mental health and social confidence as well (8). Different types of correction techniques are available. These include non-surgical ear molding in infants and surgical otoplasty for older individuals. For personalized treatment approaches, it is crucial to understand the anatomical, psychological, and cultural aspects of the condition.

While modern approaches show improved safety and precision, the risks and complications must be considered carefully in all cases.

2.3 OBJECTIVES

This literature review aims to analyze otapostasis by exploring its genetic and developmental causes, as well as the resulting anatomical abnormalities that lead to ear prominence. Furthermore, the psychological and social consequences, especially among children, are going to be reviewed. Different classification methods are going to be discussed to clarify diagnostic variability. A variety of treatment approaches is reviewed. This includes non-surgical molding and surgical otoplasty, along with their indications and complications. By synthesizing current evidence, this review aims to support enhanced understanding and management of prominent ears, while considering ethical and cultural perspectives.

2.4 METHODOLOGY AND SEARCH STRATEGY

Across multiple electronic databases, a systematic search was conducted. Included databases are PubMed, Google Scholar, ScienceDirect, and NCBI Bookshelf. Additionally, authoritative speciality sites such as Plastic Surgery Key or institutional websites (e.g. Cleveland Clinic) were analyzed to gather clinical insights and recent guidelines. The search was limited to publications in English language, published between 2000 and 2025. To ensure relevance, articles within the last 10 years were specifically focused. This literature review includes studies from different disciplines such as plastic and reconstructive surgery, otolaryngology, genetics, and psychology. To ensure accessibility, only freely available sources on the internet were included.

The following keywords and Boolean operators were used:

- "prominent ears" OR "protruding ears" OR "otapostasis"
- "otoplasty" OR "ear surgery" OR "ear reshaping"
- “auricular cartilage” AND “development” OR “elasticity” OR “scoring techniques”
- "non-surgical correction of prominent ears" OR “ear molding” OR “infant auricular deformities”
- "psychological impact of prominent ears" OR "self-esteem and otoplasty"
- "complications of otoplasty" OR “postoperative recurrence” OR "risks of ear surgery"
- “gene expression” AND “Hmx1” OR “ELN” OR “TBX15” AND “ear development”
- “shared decision-making” AND “elective pediatric surgery”
- "cultural perceptions of prominent ears" OR "ear aesthetics in different societies"

Table 1: Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Study type	Peer-reviewed journal articles, open-access systematic reviews, original research studies, book chapters, and clinically reviewed websites	Non-peer-reviewed opinion pieces, anecdotal reports, editorials, materials lacking scientific backing
Language	English	Non-English
Publication date	2015-2025	Pre-2015, unless relevant
Population	Pediatric and adult patients with prominent ears	Patients with other unrelated ear conditions
Intervention	Non-surgical and surgical techniques	Studies on unrelated ear conditions (e.g. hearing loss)

3. ANATOMY OF THE EAR

The external ear is a complex composition of skin and cartilage. The anatomical shape of the ear may vary between individuals. Still, the basic auricular anatomy is composed of the following structures: antihelix, helix, concha, tragus, and lobule, as well as ancillary structures including intertragal incisures, antitragus, and Darwin´s tubercle (1).

The average adult ear measures about 6 cm vertically, while horizontally measuring approximately 55% of the auricular height. If seen from the front, the helix extends approximately 2 mm to 5 mm from the antihelix. The conchal bowl has a sharp outer rim and extends to a depth of 15 mm. If the antihelix is poorly formed, the helical rim flops forward, which may result in prominence. If the antihelix is underdeveloped, the conchoscaphal angle can increase beyond its normal value of 90 degrees, causing lateral protrusion of the ear (1).

Usually, the auricle extends less than 20 mm from the mastoid, creating an auricucephalic angle below 25 degrees. Typically, the helix-to-mastoid distance ranges from 10 to 12 mm in the upper third of the ear, 16 to 18 in the middle third, and 20 to 22 mm in the lower third. The helix-to-mastoid distance at any location typically measures less than 3 mm, when comparing both ears. From an aesthetic point of view, the ear´s location on the scalp is similarly important as projection or three-dimensional structure. The Frankfort horizontal plane is an anatomical reference plane used for measuring facial proportions and aligning anatomical landmarks, including ear, eyebrow, eyes, and nose, in a reproducible manner. This anatomical reference plane runs from the inferior orbital rim to the top of the tragus. The top of the auricle aligns with the lateral eyebrow, and the earlobe aligns with the tip of the nose. Vertically, the ear is deviated between 15 and 30 degrees. This contributes to the natural slight rotation, if the head is seen from a lateral point of view (1). Prominent ears are defined by anthropometric measurements. These are important to evaluate the surgical process after otoplasty and ensuring symmetry post-correction. The measurements include auriculocephalic angle, depth of the conchal bowl, degree of antihelical folding and conchoscaphal angle, ear projection, and helix-to-mastoid distance (1).

4. CAUSES OF PROMINENT EARS

Various factors may lead to the development of prominent ears. The condition is primarily congenital, and genetic predisposition, anatomical factors and embryological development play a major role (1). It is important to understand these causative factors for early diagnosis and the choice of the appropriate corrective measure.

Genetic factors play a major role in the development of otapostasis, and an autosomal-dominant inheritance pattern is responsible for the high familial recurrence rate (9). According to research, genes such as the Hmx1 gene may influence the development of ear abnormalities such as prominent ears (10). Additionally, genes such as the COL2A1 or ELN genes might influence ear protrusion. COL2A1 is known to influence the production of collagen, while the ELN gene is responsible for the synthesis of elastin, which is an essential component of normal auricular cartilage (11). The TBX15 gene is involved in embryonic cartilage formation and has also been linked to abnormal auricular architecture (12). A twin study regarding auricular morphology and deformities further support the role of genetic predisposition by reporting a high concordance rate (13). However, among genetically identical individuals, still some variations exist. This suggests epigenetic and environmental influences on ear prominence.

The auricle starts to be formed at week four of embryonic development. It is formed from six mesenchymal hillocks and derived from the first and second pharyngeal arches (14). Abnormalities in positioning of the ear, its size and projection can be caused by any disruption in this developmental process.

The main component of the auricle is elastic cartilage, which provides flexibility and structure. Individuals who are affected by prominent ears seem to have one or more cartilage abnormalities. Those abnormalities include delayed or incomplete folding of the antihelical cartilage, excessive elasticity causing outward projection, and hypertrophy of the conchal cartilage (1). These irregularities may lead to aesthetic prominence, but do not cause functional impairment (1).

Antihelical fold deficiency is among the most prevalent causes of prominent ears and is a main target for surgical correction in otoplasty (15). The naturally occurring curvature of the upper ear is provided by the antihelical fold. Weakness or absence of this fold causes the backward curvature to disappear, and the upper ear protrudes outwards instead (1).

The central, deep portion of the external ear is called conchal bowl. If the concha is excessively deep or large, the auricle may be pushed forward. This overgrowth of the conchal cartilage can significantly increase the auricocephalic angle, creating a prominent appearance (1).

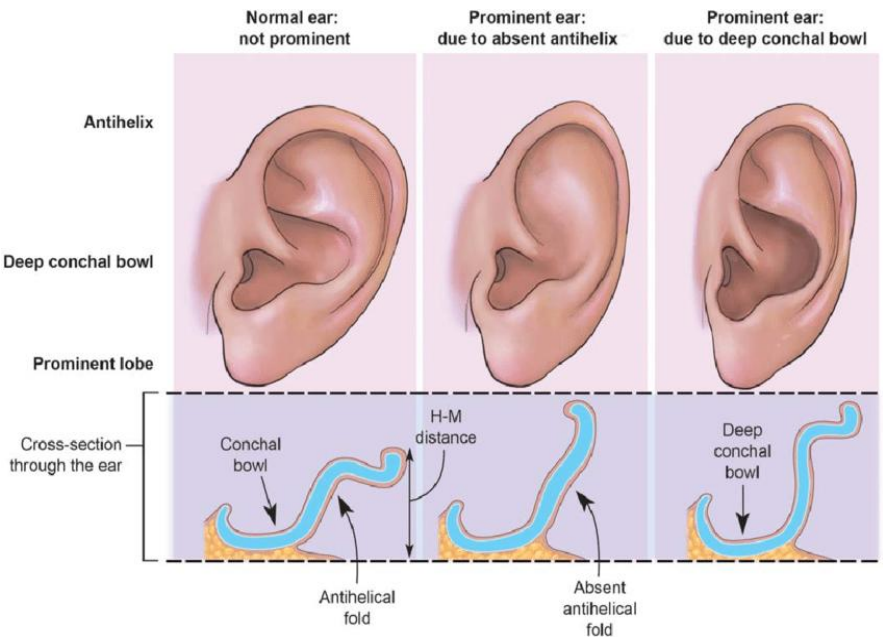

Figure 1: Causes of prominent ears (Reproduced with permission from: Kapur B, Aksu C, Gault DT. Earfold: A new technique for correction of the shape of the antihelix (Earfold for correction of prominent ears). Aesthetic Plast Surg. 2017;41(4):964–973. Licensed under CC BY-NC-ND 4.0) (17).

The mastoid process of the skull attaches muscles and ligaments that stabilize the ear. In the presence of weak or malpositioned muscles, the ear cannot be attached close to the head, causing protrusion. An abnormal auricular transverse muscle or irregularities of the posterior auricular muscle may cause prominent ears (16).

Genetics and developmental factors are the main causes of prominent ears, and several environmental and external factors, such as radiation during the foetal period, may contribute to the condition (1).

The shape of the auricle may be influenced by the factors such as the position of the foetus in the womb, as prolonged pressure on the developing ears may be contributing to the development of auricular deformities (17).

Birth trauma has been linked to abnormal ear cartilage development as well (18). However, evidence directly linking birth trauma to prominent ears is missing.

Primarily, otapostasis is a congenital condition, and immediate intervention is possible. The cartilage of neonates is highly malleable due to maternal estrogen levels, which increase the content of hyaluronic acid, leading to a softer and more pliable cartilage (19). This explains the greater effectiveness of early ear molding techniques in the first week of life, as the cartilage becomes stiffer with time. After 3 weeks, outcomes become suboptimal (20).

The extent to which postnatal positioning influences congenital prominence remains controversial, but sleeping habits and external pressure on the ears may cause a deformity. Infants frequently sleeping on their sides with prolonged ear compression may develop positional ear deformities (21).

The presentation of prominent ears can appear as a non-syndromic, isolated trait, or could be influenced by genetic syndromes. Genetic disorders that may influence auricular morphology include Fragile-X-Syndrome (22), Ehlers-Danlos-Syndrome (23), Beckwith-Wiedemann Syndrome (24), Treacher-Collins Syndrome (25), and Kabuki-Syndrome (26).

5. PSYCHOLOGICAL IMPACT OF PROMINENT EARS

About 5 % of the Caucasian population is affected by protruding ears, making it the most prevalent congenital deformity of the head and neck (1). Otapostasis is often considered a minor anatomical deviation, but the psychological as well as social consequences can be profound. Individuals with prominent ears often suffer from negative body image, lower self-esteem, and may consequently have

problems with social interactions (2). Children with prominent ears often encounter teasing and bullying, which might lead to significant psychological distress (27). The social challenges can extend beyond individual psychological effects. Affected individuals frequently experience social isolation, leading to reduced participation in social and physical activities, resulting in issues in peer relationships (28). These psychological, social and educational challenges can affect academic performance and influence overall quality of life. The systematic review mentioned above showed that individuals affected by prominent ears experience higher levels of social, educational and psychological issues than individuals affected by other facial abnormalities (2). Furthermore, children who face social challenges due to their appearance, including children affected by otapostasis, might struggle with participation, concentration, and academic achievement (2). According to a systematic review analysing 14 studies with 786 patients, the primary motivator to seek the correction of prominent ears in children is social and psychological distress, particularly if caused by bullying and teasing by classmates, and especially if experienced by males (2). In adults, motivators for surgical correction include variables like a reduced body image (29).

Post-surgical reports have shown a significant improvement in these psychosocial issues after prominent ear correction (27). One study assessed children after surgical correction and significant improvements were observed in depression and anxiety, social problems, total behavioural issues, thought problems as well as internalizing- and externalizing issues (28). According to the study, total social competence was improved. Another prospective study reported a significantly improved body image as well as a reduction in social anxiety six months after surgery. Otoplasty was found to contribute to a positive body perception and better self-esteem, as well as less anxiety and depression in adults (29).

The correction of prominent ears offers more than aesthetic correction, as it can significantly improve psychological well-being. Many individuals report improved self-esteem, reduced social anxiety, and general quality of life improvements after otapostasis. The variety of potential beneficial psychological consequences of prominent ear correction shows its importance not only as an aesthetic procedure, but as a procedure that might have significant psychosocial advantages.

6. CLASSIFICATION OF PROMINENT EARS

Otapostasis can be classified based on severity, anatomical features, clinical appearance, and association with syndromes. To allow individualized treatment approaches and to ensure optimal cosmetic and functional outcomes, it is important to understand these classification methods.

Weerda Grading of auricular dysplasia classifies auricular deformities into three grades. In grade 1, the cartilage structure of the ear is preserved. This grade includes mild deformities such as protruding ears. Grade 2 is defined by moderate deformities that affect the shape of the cartilage, and grade 3 is defined by absent structure or severe deformities (6).

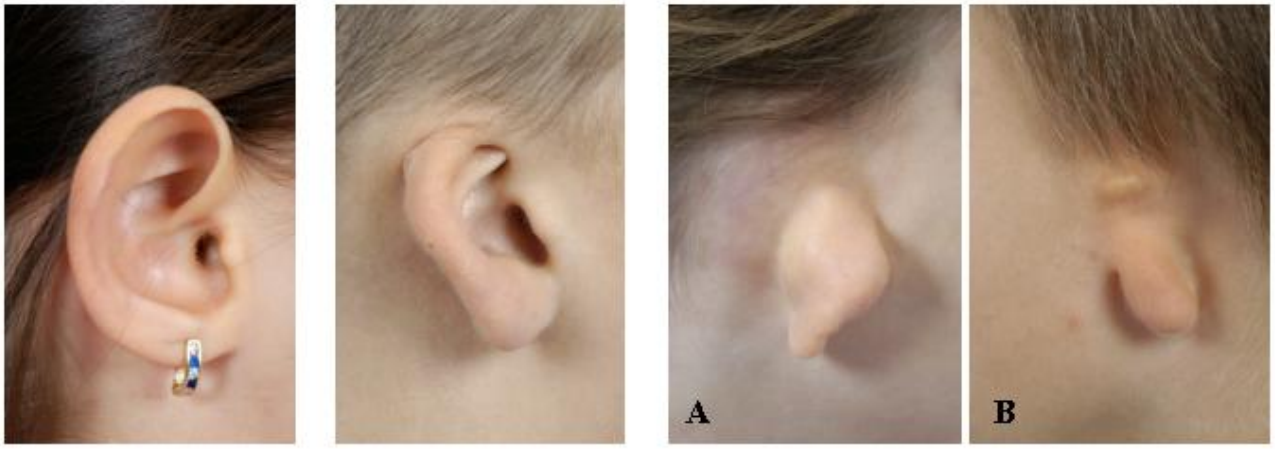

Figure 2: Weerda Classification of auricular deformities (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6).

As mentioned above, prominent ears can be classified based on anatomical deformities with different correction focuses. The three most common specific anatomical variations leading to prominent ears include antihelical fold deficiency, conchal hypertrophy, and an increased conchomastoid angle (15).

Ear deformities can be classified based on clinical appearance. There are syndromic occurrences, for example cases associated with Fragile X Syndrome (22), and non-syndromic occurrences. Most cases are non-syndromic and caused by genetic and developmental factors (1). They occur as an isolated trait

without additional abnormal craniofacial features and are often treated with cosmetic otoplasty. Syndromic prominent ears are associated with genetic syndromes affecting craniofacial development. Syndromic cases may require a multidisciplinary team including plastic surgeons, otolaryngologists and geneticists. Furthermore, otapostasis can appear unilaterally or bilaterally, although typically appearing bilaterally (1).

It is also crucial to understand the classification method based on treatment considerations. These classifications focus on the management approaches in case of prominent ears, helping surgeons to decide on the best treatment approach. One classification method that is based on treatment considerations is the age-based classification, which classifies prominent ears into moldable and non-moldable ears. During neonatal period (first 6 weeks of life), the ears are still soft and moldable because of the influence of maternal estrogen. If applied at the appropriate age, ear molding techniques can successfully correct the prominence without surgery (30).

7. NON-SURGICAL CORRECTION TECHNIQUES

Due to the malleability of the ear cartilage, non-surgical correction techniques are most effective in infants. These techniques reshape the appearance of the ear without surgical intervention (30).

A non-invasive technique is called ear molding. This method applies continuous pressure on the ear´s prominent areas via a customized molding device or specialized splint such as the EarWell Infant Ear Correction System. This technique is most useful during neonatal period, as ear cartilage is highly flexible, which is caused by elevated levels of maternal estrogen and hyalauronic acid. After the neonatal period, the estrogen levels decline, the cartilage hardens, and the effectiveness of this technique decreases. More than 75% of infants treated within the first few weeks of life, achieve permanent correction without requiring surgery (30).

Figure 3: Ear molding technique (Reproduced with permission from Hallac RR, Jackson SA, Grant J, Fisher K, Scheiwe S, Wetz E, et al. Assessing outcomes of ear molding therapy by health care providers and convolutional neural network. Scientific Reports [Internet]. 2021 Sep 9 [cited 2025 Apr 21];11(1). Licensed under CC-BY) (30).

Ear molding techniques include the taping and splinting methods. This technique utilizes adhesive strips or custom splints to gradually reshape the cartilage via external pressure. The method involves a soft, flexible splint, e.g. a thermoplastic material or silicone strip, which is applied to the ear´s antihelical fold to support proper formation. The ear is taped gently to the scalp to maintain the desired position. The treatment duration varies, but almost all treated ears improve within the first 2 weeks of application. Treatment duration is usually between 3 and 4 weeks, with regular monitoring to control the effectiveness. Indications for this technique include mild to moderate ear protrusions when started in early infancy. With prolonged duration of taping, superficial skin necrosis might occur (31).

Despite the benefits, non-surgical correction techniques have several limitations. One of the limitations is age dependency, as the effectiveness of these techniques is highest among neonates, before the ear cartilage hardens. After the neonate period, the success rate of these methods declines (30, 31). Another disadvantage of these procedures is compliance. Parents must ensure continuous wear and maintenance of tape or splints, which might be very challenging for restless infants.

8. SURGICAL CORRECTION TECHNIQUES (OTOPLASTY)

Several surgical procedures have been established to correct prominent ears. These procedures are collectively known as otoplasty and aim to achieve a more natural contour by remodeling the cartilage of the external ear. To choose the right surgical procedure, the patient's ear anatomy, the severity of ear prominence, cartilage flexibility, and personal preferences must be evaluated. It is crucial to perform a detailed preoperative assessment, including measurements of the auricle and patient expectations (6).

Since Dieffenbach performed the first procedure in 1845, more than 200 techniques have been described (32). The definite technique is not clear, but many procedures are variations of two basic concepts. Suturing methods such as Mustarde´s mattress sutures or Furnas´conchomastoid sutures rely on permanent sutures and may also involve fixating sutures to correct deformities. Scoring relies on cartilage incision. Common surgical correction techniques include cartilage suturing (Mustardé technique, Converse and Wood-Smith breaking technique), conchal setback (Furnas technique), and cartilage scoring (Chongchet, Stenström technique) (6).

8.1 CARTILAGE SUTURING (MUSTARDE TECHNIQUE)

In the year 1963, J.C. Mustardé introduced the surgical correction technique known as cartilage suturing as a possible procedure to create the antihelical fold. This method is particularly effective in patients with pliable and underdeveloped ear cartilage and individuals with an absent or underdeveloped antihelical fold. In this procedure, the cartilage is folded backwards by placement of permanent sutures. The antihelical fold is created or improved, leading to a reduced protrusion. In this procedure, it is not required to remove cartilage, which make it one of the less invasive options. Advantages of this technique include the preservation of auricular cartilage integrity, reducing the risk of overcorrection. Furthermore, this technique has a low risk of perichondrial hematoma. Children up to 10 years of age are suitable for this procedure. The risk of recurrence of prominence or suture extrusion over time, particularly if the cartilage is firm, is a disadvantage of this surgical procedure. Another risk is the development of suture granuloma (6).

The first step of this technique involves a skin incision behind the ear positioned 8-10 mm beneath and parallel to the helical rim. The skin is lifted upward to the helical rim and downward to the mastoid. To prevent post-surgical distortion of the skin, the mobilisation must not extend beyond the helical rim. The procedure can preserve auricular cartilage and the overlying perichondrium to maintain the integrity of

the tissue. The new antihelical fold is defined by needle punctures, and methylene blue may be used to mark the fold from posteriorly. Then, mattress sutures composed of non-absorbable white or transparent material, are inserted through the cartilage and perichondrium by a retroauricular approach. This ensures that the ventral skin remains untouched. The knots can be turned inward to reduce the risk of suture extrusion over time (6).

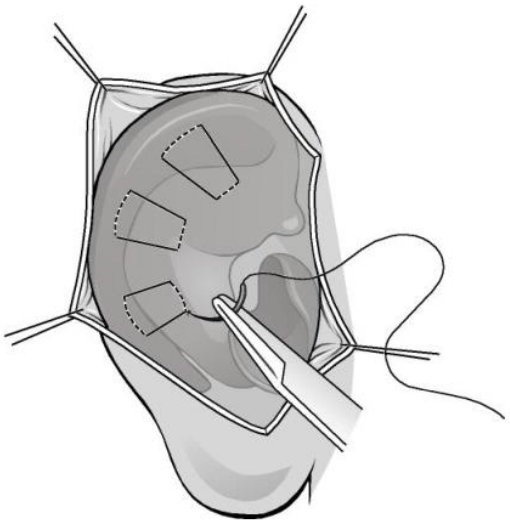

Figure 4: Mustarde cartilage suturing (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6)

8.2 INCISION SUTURE TECHNIQUE BY CONVERSE

Another commonly used correction technique for protruding ears is Converse´s technique. This method is particularly suitable for patients with stiff or thick auricular cartilage. This procedure combines cartilage incision and mattress suture placement to create a new antihelical fold via a retroauricular approach. In this technique, cartilage incisions are made parallel to the antihelix and helical rim. Originally, Converse performed full-thickness transections of cartilage, but modern approaches recommend the preservation of sharp, unaesthetic edges in the antihelical region. It may be beneficial to perform additional scoring with a forceps or scalpel to bend the cartilage. Nonabsorbable horizontal mattress sutures are used to stabilize the newly created fold. For comprehensive ear shaping, additional procedures, including lobuloplasty and cavum rotation and fixation, can be applied. If compared to

Mustardé's suture-only technique, the method of Converse is better suitable for patients with a stiff cartilage. Furthermore, this technique often achieves more durable and typical outcomes. When sutures are over-tightened or poorly positioned, complications such as edge formation, or "hidden helix" deformity may occur. Preserving the ventral perichondrium and carefully managing suture tension and placement helps to minimize the risk for complications (6).

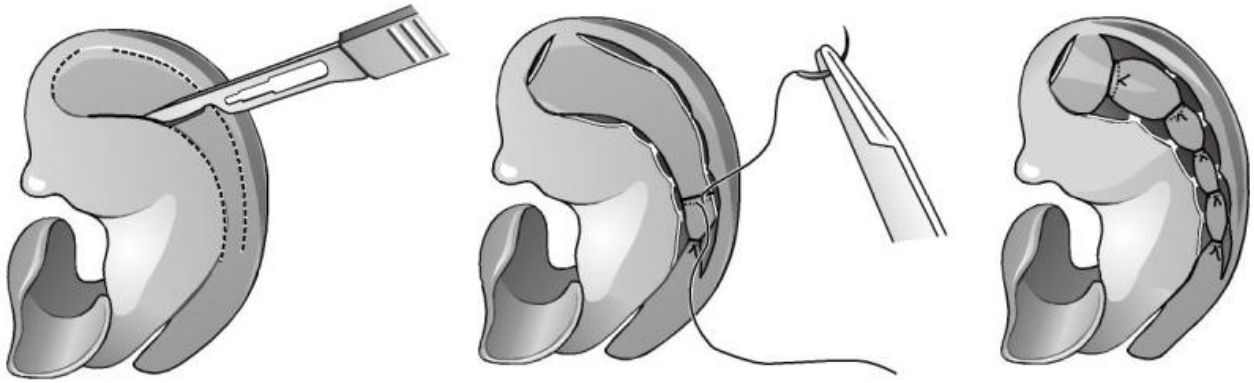

Figure 5: Incision-suture technique by Converse (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6)

8.3 INCISION SCORING TECHNIQUES (STENSTRÖM, CHONGCHET, CRIKELAIR TECHNIQUES)

Incision-scoring techniques represent a very effective approach for reshaping the antihelix in patients with rigid cartilage that limits the success of suture-based otoplasty. These methods can produce durable and aesthetically pleasing results when performed with anatomical precision and caution (6).

In 1958, Gibson and Davis demonstrated that when cartilage is unilaterally scored or incised, it warps toward the scored side by itself, especially when bending it into a concave shape. The discovery of this principle provides a predictable method for reshaping thick cartilage, particularly in otoplasty procedures, that target the reconstruction of the antihelical fold. Building on this biomechanical principle, the surgeons Stenström, Chongchet and Crikelair each developed their variations of incision-scoring techniques to achieve a natural looking antihelix surgically (6).

The first step of these procedures is an incision parallel to the scapha, followed by detailed evaluation of the perichondrium layer over the antihelical cartilage and the anterior skin. As soon as it is exposed, the anterior surface of the cartilage is selectively scored by a scalpel or Adson-Brown forceps. The aim is the induction of a controlled convex warp and shaping the antihelix without completely cutting through the cartilage (6).

Stenström´s technique uses a rasp to score the anterior cartilage. This is performed blindly, as the cartilage is scored without direct visualization after lifting the overlying soft tissue. The incision runs from the tail of the helix to the scapha, enabling broad access to the antihelical region (6).

Chongchet and Stenström complement their cartilage work with retroauricular spindle-shaped skin excisions which supports the reduction of skin redundancy and maintaining the ear´s new position (6).

These techniques are most effective in patients who have stiff or thick auricular cartilage, as suture-only techniques such as Mustardé are not sufficient for correction or longevity of the result. By exploiting the natural biomechanical properties of cartilage, incision-scoring enables long-lasting reshaping (6). These techniques come with some risks. One possible risk is the creation of unnatural contours or visible edges along the antihelical ridge due to overly deep scoring. Another possible complication is an injury to the ventral perichondrium, which may lead to chondronecrosis, a condition defined by the death of cartilage tissue and possible consequent deformity. Furthermore, the accompanying excision of skin could trigger keloid formation of hypertrophic scarring, particularly if performed too aggressively and in patients who have a predisposition to abnormal wound healing (6).

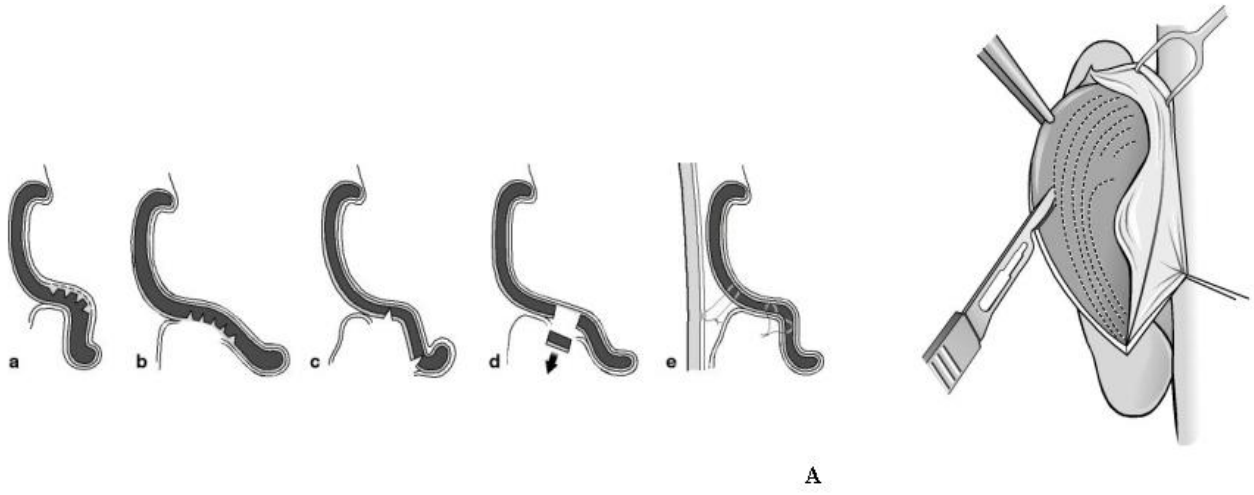

Figure 6: Incision-scoring techniques (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6)

8.4 CARTILAGE THINNING BY WEERDA

The otoplasty technique according to Weerda is a practical solution that enables reshaping thick and inelastic auricular cartilage, which can be resistant to other surgical techniques. The approach of Weerda is a simple but effective option for antihelix formation in patients with low cartilage elasticity (32).

To thin the cartilage both below and above the planned antihelical fold and antihelical crus, a diamond drill is used. Due to this thinning process, the cartilage weakens and becomes more pliable for reshaping. It is important to use continuous irrigation, as drilling would cause thermal damage to the cartilage. After the thinning, full-thickness mattress sutures made of slowly absorbable material are placed at marked positions to anchor the new fold (32).

Possible risks and complications include inadequate irrigation or drilling, which may lead to chondronecrosis. Furthermore, if absorbable sutures degrade prematurely or if the cartilage is not prepared sufficiently, the ear can fully or partially relapse into its original prominent shape. To reduce the probability of recurrence, nonabsorbable sutures, similar to the Mustardé technique, can be used to modify the method and provide more durable results (32).

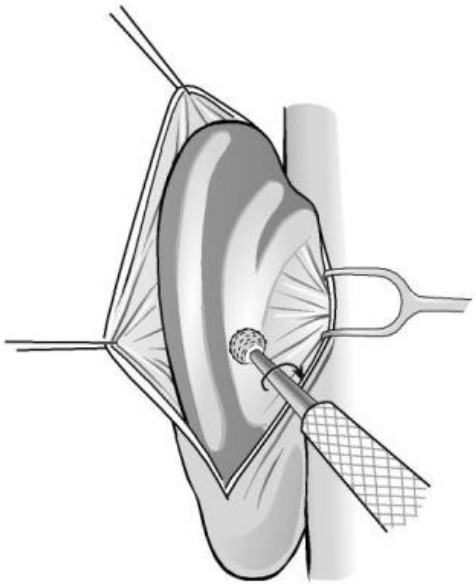

Figure 7: Technique according to Weerda (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6).

8.5 OTOPLASTY BY WALTER

This technique is an incision-based method developed to correct all types of prominent ears and is particularly suitable in cases where cartilage architecture and tension are contributing factors. It is an effective procedure for primary as well as revision surgeries, but the procedure is considered technically demanding and requires a high level of surgical expertise and deep anatomical understanding of the external ear. This method addresses high-tension zones such as the intratragal notch, helical ligament, and cauda helicis around the principle of easing tension and shaping (32).

Via a retroauricular incision, the dorsal surface of the auricular cartilage is exposed about 5 mm in front of the mastoid. Then, a curved cartilage incision is made, starting 5 mm from the helical rim. This incision extends around the auricle toward the region of the inferior crus and continues toward the concha, ending near the intertragal notch, especially in case of absence or underdevelopment of the antihelical fold. To preserve cartilage structure and reduce postoperative deformities, the anterior perichondrium is left intact. If necessary, the cauda helicis is excised, allowing increased mobility of the ear lobule. Also crescent-shaped conchal cartilage reductions can be performed during this step. Further, this method includes severing of the helical ligament, while being cautious with the superficial temporal vein and artery. At the base of the inferior crus and the intertragal region, additional cartilage is removed to eneable anterograde rotation and relieve mechanical tension. It is possible to shape the antihelical fold by either removing sections of cartilage in a scale-like pattern or weakening techniques can be applied to achieve softening of the cartilage. The last step involves nonabsorbable, temporary percutaneous mattress sutures to form and stabilize the newly shaped antihelix and crura. These sutures are removed later, eliminating the risks associated with long-term sutures (6).

Potential complications include vascular injury, visible cartilage edges, and difficulty correcting future recurrences, particularly in previously operated or scarred tissues (32).

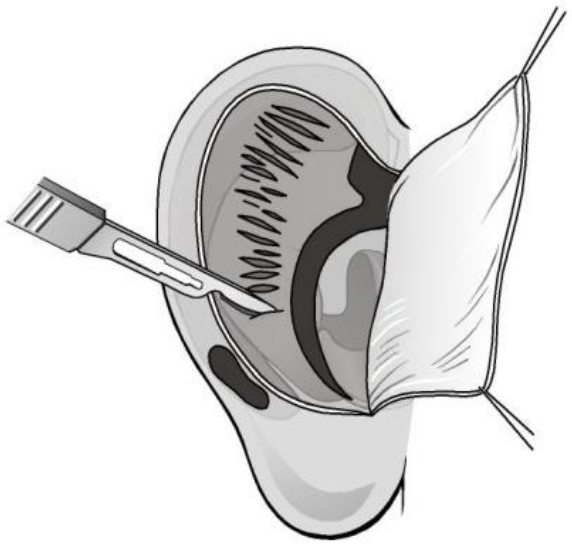

Figure 8: Technique according to Walter (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6).

8.6 CARTILAGE ISLAND FLAP BY PITANGUY

Pitanguy developed the cartilage island flap technique as a refined incision-suture method. The procedure uses a carefully excised cartilage island to create a new antihelical prominence. Symmetrical outcomes in nearly 100% of patients after 25-year have been reported, but the method is only suited for experienced surgeons as it is complex and requires a high level of precision (6).

The first step of this procedure involves anterior color marking of the desired antihelix position by needles and methylene blue. The posterior auricular cartilage is exposed by a retroauricular skin incision. Around a marked cartilage island in the antihelix region, a crescent-shaped incision is made, allowing for undermining of the anterior perichondrium while keeping it intact. This allows the preservation of vascular supply and helps maintain cartilage viability. Then, the island is reshaped and fixed in position using absorbable sutures, which results in a folded structure simulating the natural antihelix via an overlay technique (32).

It is possible to combine this procedure with cavum rotation, lobuloplasty, or Furnas-style conchal fixation for comprehensive ear reshaping (6).

Pitanguy´s technique can lead to lasting and satisfactory results, but it has a high level of technical demand. Furthermore, this procedure is associated with significant postoperative risks, including an increased risk of hematoma formation, sharp cartilage edges in the newly formed antihelix, risk of suture dehiscence, and asymmetrical results caused by unevenly shaped or positioned cartilage islands (6).

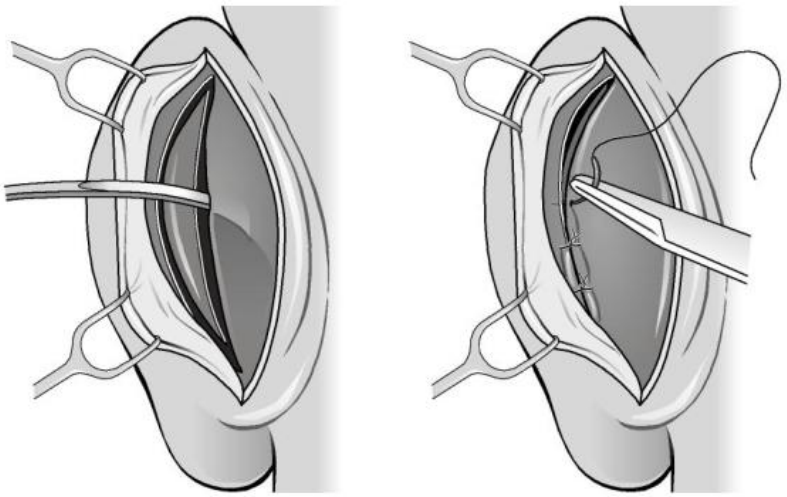

Figure 9: Cartilage island flap according to Pitanguy (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6).

8.7 CONCHAL CARTILAGE EXCISIONS

Conchal cartilage excision techniques aim to reduce the height or size of the concha or cavum conchae, which may contribute to the protrusion of the ear. A variety of surgical methods can be applied to weaken the cartilage, including cartilage excisions and scoring-incision techniques. Two main ways are used to excise the conchal cartilage. The anterior access involves a combined skin-cartilage excision, directly exposing the anterior surface. The retroauricular or posterior access can often preserve the skin and anterior perichondrium, which minimizes the risk of visible scarring. Currently, there is no clear evidence preferring one access route over the other regarding clinical results (6).

In 1955, Converse advocated spindle-shaped cartilage excision by a retroauricular approach, preserving the anterior perichondrium. Stenström described the reduction of the concha via anterior access, combined with antihelix scoring and performing a spindle-shaped excision to reduce the volume of the concha. Beasley and Jones used a posterior approach to achieve excision of the lower conchal bowl, aiming on a reduction of antitragus height. Bauer and Elliott supported anterior conchal excision together with removal of an anterior skin strip, targeting the prevention of cosmetically undesirable skin folds in the conchal region (6).

8.8 CONCHAL SETBACK (CAVUM ROTATION AND FIXATION ACCORDING TO FURNAS)

In the year 1968, Dr. David Furnas developed the surgical correction technique known as conchal setback or Furnas technique. This surgical correction technique is most suitable for patients with excessive conchal cartilage depth with an otherwise well-formed antihelical fold, but it can be combined with antihelix-forming sutures (e.g., Mustardé) in the presence of both features. In the first step, a retroauricular incision is made in the sulcus, and a thin skin flap is elevated to expose the full thickness of the conchal perichondrium anteriorly and the mastoid fascia posteriorly. Then, three to four horizontal mattress sutures of 4-0 nonabsorbable monofilament are placed. First, each needle passes through both the anterior and posterior perichondrial layers of the marked conchal rim while carefully avoiding any breach of the anterior skin. Then, it is directed through a robust bite of mastoid fascia located several millimeters posterior to the conchal edge. By seating the conchal bowl against the mastoid periosteum and tying each suture with just enough tension to achieve a helix–mastoid distance of approximately 10–15 mm, the auricle is permanently retracted without the need for cartilage incisions. Posterior placement of the mastoid bites is critical as too-anterior sutures risk buckling the conchal wall and narrowing the external auditory canal, while superficial fascia bites can pull through over time. When the desired setback is confirmed, the incision is closed in layers, preserving a thin subcutaneous cushion over the knots to minimize palpability. When performed with precise marking, proper vector control, and careful suture technique, the Furnas sutures can reliably restore a natural auriculocephalic angle, maintain a smooth retroauricular sulcus, and deliver long-lasting, aesthetically pleasing results (33).

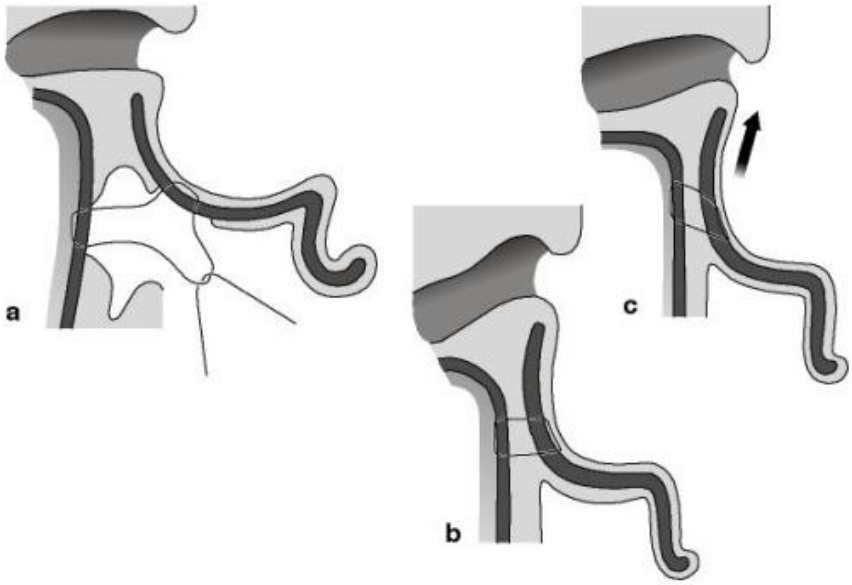

Figure 10: Cavum rotation technique (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6).

8.9 CONCHAL CARTILAGE WEAKENING

These techniques have been developed to reshape the concha by reducing its rigidity, allowing an improved contour and correction of protrusion. These procedures are based on the cartilage warping principles first described by Gibson and Davis and later applied by Stenström and Chongchet (6).

Tools and techniques to weaken the cartilage include Scoring and incision techniques, diamond drills, rasps, Adson-Brown forceps, and needles (6).

In many cases, a combination of cartilage sutures and mattress sutures is used to anchor the new position of the reshaped concha. In patients who have naturally soft cartilage, especially in the cavum conchae, sufficient reshaping can sometimes be achieved by sutures alone, without the need for mechanical weakening (6).

8.10 LOBULE MANAGEMENT

Surgical procedures to correct prominent ears often overlook the position of the ear lobule and can sometimes even worsen its protrusion. Addressing the lobule is a separate but integral component of comprehensive otoplasty. For best aesthetic results, the final step of the procedure should involve analysis and correction of the ear lobule to ensure straight vertical alignment of helical rim and lobule. If the alignment is incorrect, undesirable deformities such as the “telephone ear” due to overcorrection or the “reverse telephone ear” due to surgical undercorrection may occur (1).

The approach by Gosain addresses the lobule by focusing on the so-called “point of control”, which is located next to the retrolobular sulcus, allowing repositioning of the lobule without distortion. From this point, a perpendicular incision is made to the postauricular skin, followed by the removal of two triangular skin segments. Then, the lobule is anchored using a suture that is passed through the point of control and attached to the mastoid fascia, effectively controlling its position (1).

The Wood-Smith’s fishtail excision technique and Spira’s wedge excision method are other possible approaches. The latter uses a deep dermis-to-scalp periosteum suture reposition the lobule (1).

Siegert introduced a method to carefully dissect the connective tissue toward the lobule at the incision´s lower end. Then, the skin situated on the front and back of the lobule is separated. This allows the placement of absorbable mattrass suture that connects the edge of the lobule to the cavum conchae. This technique allows repositioning of the lobule without further skin removal (6).

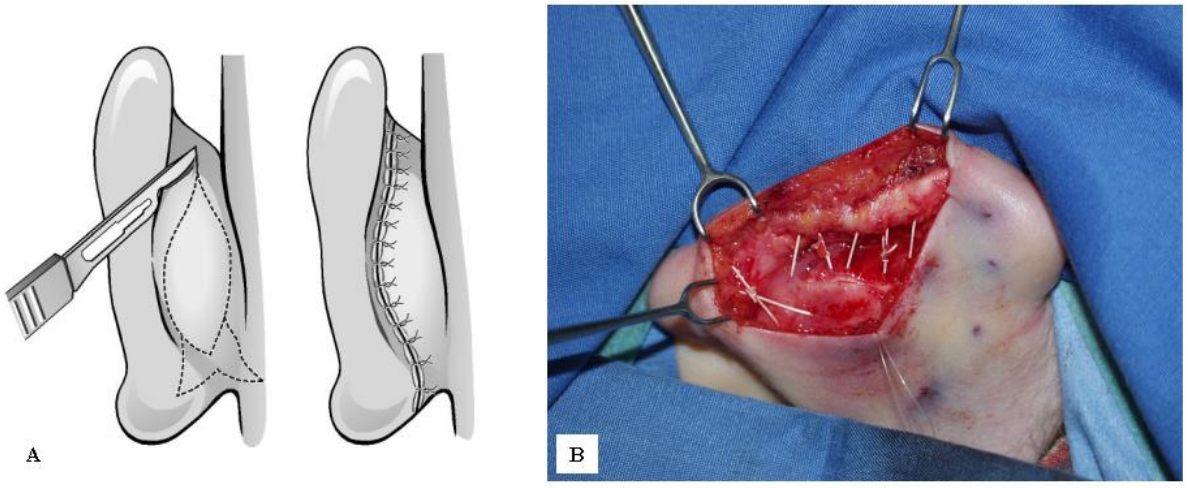

Figure 11: Lobuloplasty. A: Skin excisions, B: Lobuloplasty according to Siegert (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6)

8.11 MODERN AND MINIMALLY INVASIVE APPROACHES

Over the last years, a variety of minimally invasive surgical correction techniques have emerged. These modern approaches aim to reduce surgical trauma, haematoma risk, and visible scarring. The simplest approach, first popularized by Fritsch, is a purely suture-based method. In this procedure, percutaneous horizontal mattress sutures create the anthihelical fold without any cartilage incision. Peled developed a modification known as “incision-free otoplasty” that combines this suture technique with blind anterior antihelix scoring through a tiny stab wound behind the cauda helicis (6).

Endoscopic-assisted otoplasty, as described by Graham and Gault, inserts an endoscope through a small hairline incision to guide retroauricular blind scoring and percutaneous scapha-mastoid fixation sutures (6).

Rauning introduced a method to delicately weaken the antihelical and conchal cartilage with a specialized diamond rasp, which is applied through minimal skin incisions situated on the inner surface of the upper helical rim and the lower portion of the antihelix (6).

Benedict and Pirwitz have described a technique that combines subcutaneous, cartilage-penetrating nonabsorbable mattress sutures with blind anterior antihelical scoring with a specialized instrument (6).

8.12 LASER-ASSISTED REMODELING

The method of Laser-assisted cartilage reshaping is based on the heat-responsive properties of cartilage to achieve non-incisional ear correction. Heating cartilage to 50-70°C leads to the induction of stress relaxation, allowing molded deformations to become permanent. The optimal wavelength for cartilage reshaping is 1540 nm as the penetration depth matches auricular cartilage thickness while generating even heating. According to a systematic review of seven clinical series, laser-assisted cartilage reshaping achieves a comparable level of correction to traditional otoplasty but without incisions or scarring. The main complications include minor skin burns and dermatitis (1).

9. PREOPERATIVE EVALUATION

A thorough preoperative evaluation is crucial to ensure patient safety and optimal surgical outcomes. It should include a detailed medical history, careful physical examination, and psychological assessment of the patient (6). Early identification of indications and contraindications, while managing expectations realistically, is crucial to find the most appropriate treatment method (15).

Clinicians should routinely ask about previous ear infections and chronic dermatological diseases, as these might elevate the risk of postoperative complications. Furthermore, systemic illnesses such as hypertension, bleeding disorders, and diabetes mellitus may impar microvascular circulation and slow down the healing process (15).

It is also important to assess the tendency of a patient toward excessive scar formation. Additional postoperative treatments such as the application of scar ointments may reduce the risk of hypertrophic scarring (6).

It is essential to include a comprehensive anatomical examination before deciding on a treatment technique. Features such as the antihelical fold, conchal depth, and auriculocephalic angle, all contribute to the overall protrusion of the ear. It might be difficult to define a standard, since ear size and shape can vary widely among individuals. Quantitative metrics such as auricular dimensions and projection measurements are helpful, but the ear should always be assessed within the context of overall facial

proportions and symmetry. Even small variations may seem more or less significant depending on the patient´s individual perception and expectations (1).

To preoperative evaluation, an objective and systematic approach is required to avoid missing small variations from typical anatomical features. Very important anatomical parameters of surgical planning include the auriculocephalic angle, helix-to-mastoid distance, ear height, width, and scalp position. The auriculocephalic angle and helix-to mastoid distance are of major importance, as these parameters directly influence the projection of the ear. The antihelical fold and the conchal bowl deserve special attention as well, abnormalities of these structures are also contributing to ear prominence. Otherwise hidden conchal hypertrophy can be revealed by gentle medial pressure on the helical rim. It is required to compare these measurements with the contralateral ear. This helps to determine the required degree of correction. Additional auricular anomalies, including Stahl´s ear, macrotia, constricted ears, conchal crus deformities, or Darwin´s tubercle, should be identified. This allows simultaneous correction, and the aesthetic outcomes are maximized. Standard preoperative evaluation typically includes photographs from an anterior, lateral, and posterior perspective. Audiological consultations or specialized imaging are not necessary unless acoustic function concerns arise (1).

The psychological impact of prominent ears is another essential consideration in preoperative evaluation. When discussing treatment options with patients and their families, it is important to be empathic while addressing the psychosocial effects of auricular deformities. Especially in peer settings, social engagement and self esteem can be influenced negatively. A referral for psychological evaluation might be appropriate. Older children should be included in the decision-making process to support the development of a sense of control and increase their confidence throughout the treatment (1).

Evaluating the elasticity of the auricular cartilage is an important step in selecting between suturing, excision, or scoring techniques. In addition, a thorough otolaryngological examination should include inspection of the posterior auricle to rule out trauma, lesions, or other complicating factors (6).

It is also important to consider overall symmetry and harmonization as some patients with unilateral deformity may require customized surgical planning. Furthermore, the surgical correction should maintain overall facial proportions (1).

Another very important aspect that needs to be evaluated is psychological assessment. In many cases, otoplasty is driven by self-esteem concerns and patients, especially children and adolescents, that may face social challenges such as bullying. Potential risks and visual outcomes should be included in

informed consent. Studies show the otoplasty can significantly improve confidence and social wellbeing in affected individuals, but in case of unrealistic expectations, or if psychological conditions such as body dysmorphic disorder are suspected, performing otoplasty may not be beneficial (15).

9.1 INDICATIONS

The decision to perform otoplasty should be based on a comprehensive evaluation by a qualified surgeon who considers both physical as well as psychological factors (15).

Common anatomical indications include an auriculocephalic angle that exceeds 30°, an overly deep conchal bowl that pushes the ear outward, and a poorly defined antihelical fold that contributes to the protrusion. Most surgeons recommend waiting until the child is at least five years old. At this age, the cartilage is nearly fully developed. Furthermore, psychological and social concerns play a critical role. Children or adults who experience low self-esteem, teasing, or social withdrawal due to their protruding ears may benefit significantly from otoplasty (15).

9.2 CONTRAINDICATIONS

In some cases, it may not be appropriate to perform otoplasty, and contraindications must be assessed carefully. Active ear infections, poorly controlled chronic illnesses like hypertension or diabetes, and coagulopathies significantly increase the risk of complications such as poor wound healing (15).

It also important to consider psychological aspects. For example, patients with unrealistic expectations or body dysmorphic disorder may remain unsatisfied, even if the surgery was objectively successful (15).

Otoplasty should be approached carefully in individuals who are unlikely to adhere to postoperative care recommendations. This includes young children who may traumatize surgical sites or resist to wear necessary protective headbands (15).

Furthermore, lifestyle factors must be considered as well, as patients who actively participate in activities with high risk of ear trauma, including contact sports, should postpone the surgery to prevent damage to the recently operated ears (15).

9.3 CHOOSING THE RIGHT TECHNIQUE

The choice of surgical technique depends on specific anatomical abnormalities and the physical characteristics of the cartilage. Three major deformities are addressed, including cavum hyperplasia, antihelix hypoplasia, and protruding lobules (6).

In cases of cavum hyperplasia (in the presence of excessive conchal cartilage), several surgical methods can be employed. Furna´s technique of cavum rotation and fixation reposition the conchal bowl and secures it to the mastoid fascia to achieve a more aesthetically pleasing ear position. If necessary, Walter´s technique involving cavum resection can reduce excess cartilage via excision (6).

For patients with antihelix hypoplasia, the surgical approach depends on cartilage consistency. In cases of soft and pliable cartilage, minimally invasive methods such as the Mustardé technique can effectively shape the antihelix without incising cartilage. Alternative minimally invasive techniques, as described by Peled and Benedict and Pirwitz, achieve good outcomes with reduced scarring by combining limited scoring with sutures. If the cartilage is stiff or firm, or in case of a revision surgery, cartilage modification techniques are required. Incision-scoring techniques like those introduced by Stenström, Crikelair, and Chongchet enable precise weakening and reshaping of stiff cartilage. Alternatively, the incision-suture technique by Converse combines cartilage incisions with strategic mattress sutures to create the desired antihelical fold. Further effective methods for firm cartilage, including those by Weerda and Walter, use tailored scoring or excision techniques to reshape and reposition the auricle. It is common to choose a hybrid approach combining techniques from soft and firm cartilage to ensure optimal results (6).

The correction of protruding lobules is executed by specific lobuloplasty techniques. The method by Siegert uses mattress sutures to reposition the lobule posteriorly. The prominence can also be addressed via techniques such as shortening of the antitragus, as described by Walter and Webster, or excisions of skin followed by V-Y sutures to achieve a harmonic and symmetrical ear contour (6).

9.4 PATIENT SELECTION CRITERIA FOR SURGERY

Otoplasty can be recommended in individuals who are at least 5 years old (when ear cartilage is mature enough for surgery), are in good general health (no bleeding disorders or other uncontrolled medical conditions), do not have active ear infections or significant amount of scar tissue from previous surgeries, are psychologically prepared, particularly in paediatric patients parental support is very important, and have realistic expectations about the result (15).

10. POTENTIAL RISKS AND COMPLICATIONS

Otoplasty is generally a safe and effective procedure (5), but surgical as well as non-surgical correction techniques still carry potential risks and complications. It is crucial to understand these to be able to perform effective management and to guide informed decision-making.

10.1 COMPLICATIONS OF NON-SURGICAL METHODS

Non-surgical techniques, such as ear splinting or molding, are mostly recommended in infants by reshaping the cartilage during the stage when it is pliable. According to a study, complications and risks of molding devices include dermatitis (10 of 91 ears), skin excoriation (6 of 91 ears), and ulceration (2 of 91 ears), caused by permanent pressure. Ear molding does not directly cause head asymmetry, but may occur because of the tendency of infants to lie on the opposite or in supine position when using a bilateral system. One of the main risk factors for developing positional plagiocephaly is the sleeping position. It is also possible that non-surgical techniques may not lead to the desired outcome, particularly if the deformity is significant or in older patients where the cartilage is less malleable (34).

10.2 COMPLICATIONS OF SURGICAL METHODS

The categorization of complications following otoplasty can be based on early and late types (6).

Early complications typically arise within days or weeks after surgery. They include hematomas, infections that may lead to perichondritis, postoperative bleeding, significant pain, allergic reactions, and, in extreme cases, necrosis of cartilage-skin. Cartilage-weakening techniques such as scoring or incision methods are frequently associated with hematomas. Immediate detection followed by intervention through careful follow-up by the surgeon can mitigate many of these early complications. If pain or discomfort is experienced during the early preoperative period, this could indicate an underlying issue such as infection or hematoma and should be evaluated immediately. In some cases, a dressing adjustment may be required (6).

Late complications typically arise within weeks and months after surgery. These typically include hypertrophic or keloid scarring, suture-related fistula formation, sensory disturbances like hypoesthesia, development of new deformities, and, in some cases, recurrence of the original deformity. It is essential to monitor for these issues in regular follow-up appointments to enable early intervention. Patients with

a tendency to the formation of keloids should be informed about their elevated risk, and preventive measures, such as scar ointments, could be applied. Superficial or rejected suture material is often indicated by the appearance of a fistula. In these cases, surgical revision may be required to remove the problematic sutures and close the fistula. Recurrence of ear protrusion can still occur, despite correctly performed otoplasty. These potential risks and complications should be clearly communicated with the patient or their guardians during consultations and consent discussions. A detailed patient education, careful surgical planning and correct execution, greatly improve cosmetic outcomes and patient satisfaction in otoplasty (6).

11. POSTOPERATIVE CARE

Adequate postoperative care after otoplasty plays a significant role in ensuring healing, maintaining the shape of the external ear, and preventing complications. Cotton or strep dressings soaked in antibiotic or disinfectant solutions helps to preserve the new ear contour and prevent infection (6).

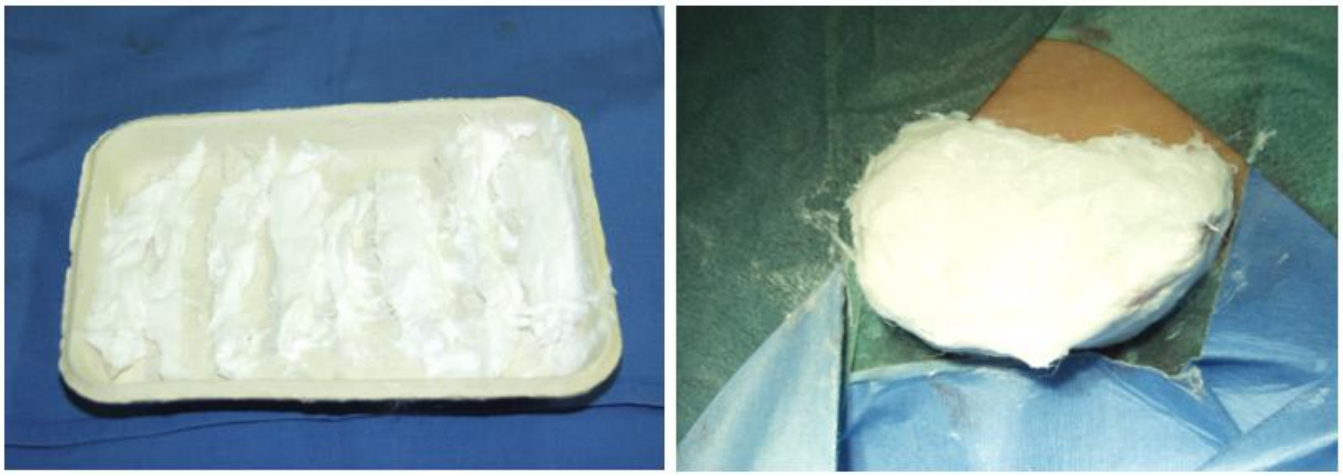

Figure 12: Ear dressing (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6)

Typically, the first dressing is changed on postoperative day 1 or 2 to monitor for hematoma formation, which can be drained directly after detection. During the first week, dressings should be changed twice to monitor the healing process and maintain hygiene. In surgeries that involve significant manipulation

of cartilage, a 7-day course of antibiotics that penetrates cartilage tissue may be administered peri-and postoperatively. Sutures are removed on day 7 or 8 and the patient starts to wear a protective headband for the next 4 to 6 weeks, especially at night, to prevent undesired bending of the ear. To assess long-term outcomes, clinical and photographic documentation is recommended at 6 and at 12 months post-surgery (6).

12. CASE EXAMPLE

A 6-year-old-girl with a head-ear distance and prominent ears was teased by peers. To correct the prominence, otoplasty was performed under general anaesthesia. The physical examination revealed soft and elastic cartilage, antihelical fold underdevelopment, and cavum hyperplasia. Three procedures were performed in combination, including Mustardé suture technique, cavum rotation and fixation, and moderate lobuloplasty (6).

At 6 months after surgery, excellent cosmetic results were described, including a reduced ear-head distance of 16-17 mm, a well-defined antihelical fold, a smaller cavum conchae, and a repositioned lobule (6).

This case shows the importance of adequate preoperative evaluation and personalized selection of correction techniques for achieving optimal and durable results in pediatric otoplasty.

Preoperative

6 months postoperatively

Figure 13: Surgical results after otoplasty (Reproduced with permission from: Naumann A. Otoplasty – techniques, characteristics and risks. GMS Current Topics in Otorhinolaryngology, Head and Neck Surgery [Internet]. 2008 Mar 14;6:Doc04. Licensed under CC-BY-NC-ND 3.0.) (6)

13. ETHICAL AND CULTURAL CONSIDERATIONS

Ethical and cultural considerations are crucial aspects in clinical practices and enable patient-centred care. This section analyses ethical aspects of paediatric interventions, cultural perspectives on ear aesthetics, and the importance of informed consent and patient autonomy.

Children may lack the ability to make fully informed decision, and performing otoplasty on children requires careful ethical deliberation (35). The consent for surgical procedures is given by legal guardians or parents, but it is ethically necessary to involve the paediatric patient in the decision-making process to the extent of their understanding (36). The emerging autonomy of the child should be respected by explaining the procedure in an age-appropriate manner and seeking the child´s assent (37). Parents and physicians must determine the benefit-risk-ratio by considering the psychological well-being, social experiences, and general physical health. It is important to avoid unnecessary interventions, while the decision should prioritize the child´s overall wellbeing (35).

It is central to ethical medical care to respect patient autonomy, especially regarding informed consent. Patients or their guardians should understand not only the procedure but also the potential risks, benefits, and likely outcomes. This information should be communicated clearly and in a way that matches the understanding of the patient. Consent should be given voluntarily and free from pressure, while giving the opportunity to ask questions. Patients and their families should be engaged collaboratively in the decision-making process. This might generate trust in the patient-clinician relationship and may enhance adherence to treatment plans and satisfaction (38).

Cultural attitudes toward ear shape and prominence vary widely and may significantly influence the perception of ear aesthetics and decisions regarding corrective measures (39). In some regions, protruding ears have positive connotations. Some cultures, for instance, see them as a sign of good fortune and prosperity (40), while others might consider them a cosmetic imperfection. Surgeons should be aware of how beauty ideals and symbolic meanings influence treatment decisions (3).

14. DISCUSSION AND RESULTS

This thesis examined the causes, psychological implications, and treatment approaches including their risks and complications, drawing on recent literature and clinical evidence. It aimed to integrate anatomical detail and patient-centred considerations, to provide a comprehensive overview of current best practices.

The review confirms that prominent ears, although not causing any functional impairment, may cause substantial psychosocial morbidity, especially in the paediatric population. The psychological issues are documented in various studies and include bullying, social withdrawal, and impaired academic performance. Prominent ears are not only a cosmetic issue but a condition with substantial psychosocial consequences.

The findings confirm the efficacy of non-surgical and surgical correction methods. Ear molding is a non-invasive method for correction of otapostasis. It is only effective in neonates due to the increased cartilage malleability caused by the influence of maternal estrogen. The effectiveness is time-limited, as it should be implemented within a week after birth.

Surgical correction methods are gold standard after the neonatal period. Among different reviewed techniques, Mustardé sutures and Furnas conchal setback were identified as frequently used and reliable methods. They offer good cosmetic results with minimal invasiveness. Other methods, like those described by Pitanguy or Walter, are more complex and provide further methods for individualized correction. These more complex techniques may be especially useful in revision surgeries or cases of structural asymmetries. Generally, the success rate of otoplasty is high, but complications, including hematomas, infection, suture extrusion, or relapse, underscore the importance of careful technique selection and postoperative care.

The reviewed case study presented a surgical multi-technique approach, suitable for the individual anatomical features. It showed how the combination of Mustardé sutures, cavum setback, and lobuloplasty can result in significant improvement in aesthetics and patient satisfaction. These findings are confirmed in broader literature supporting hybrid approaches for best outcomes.

From an ethical point of view, especially regarding children, it is important to involve the child in the decision-making process by respecting their emerging autonomy. Furthermore, cultural perceptions of aesthetics may vary and influence treatment decisions.

15. CONCLUSION

1. The correction of prominent ears can significantly improve self-esteem, patient satisfaction, and quality of life, especially in children.
2. Corrective measures must be applied at the appropriate age and based on individual anatomic indications.
3. The Mustardé, Furnas, and Stenström/ Chongchet techniques are the most used and historically approved otoplasty procedures.
4. Innovations in minimally invasive techniques and long-term comparisons should be specifically focused on ongoing research.

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