

Rasping First Technique in Otoplasty

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Abstract

Background: There have been more than 200 techniques published for the treatment of prominent ears, demonstrating that there is not a single, used method that most surgeons use. Due to the psychosocial issues, it generates, prominent ear deformity is one of the aesthetic issues that should be reconstructed. An optimal otoplasty operation should produce good maintained aesthetic results with no recurrence.

Objective: The aim of this study is to evaluate patient satisfaction after otoplasty using the rasping as the first step in otoplasty.

Patients and Methods: This is an interventional clinical trial including forty individuals with prominent ears. All patients were operated on at El Dmerdash Hospital according to our study's inclusion and exclusion criteria using rasping of cartilage as the first step in our technique.

Results: Using anterior rasping as first step in otoplasty achieve a high patients' satisfaction rate postoperatively and facilitate the surgical steps. most of our patients were satisfied with the ear in general and, (90%) were satisfied with right ear and (92.5%) were satisfied with left ear. Patients were satisfied with ear fitting with face as (95 %) with right ear and (90%) regarding left ear with Significant improvement in post operative symmetry $p < 0.001$.

Conclusion: Using rasping as first step in otoplasty improves aesthetic outcomes in adults. Anterior rasping decreases blood loss shortens operative time and decreases the incidence of recurrence through weakening of cartilage memory. adequate weakening of cartilage through anterior rasping corrected the protrusion, improved the symmetry, and maintained it.

Key Words: Otoplasty – Rasping – Cartilage.

Disclosure: No conflict of interest

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Introduction

In the present era of Otoplasty, advances in technology and our understanding of ear anatomy have given the otoplastic surgeon the opportunity to offer greater results than we could have imagined years ago. This includes a deeper understanding of the anatomic basis of the soft tissue and cartilage planes of the ear and the facial musculature [1].

Even while ear deformity seldom affects a person's physiology, it can have a substantial psychological and aesthetic impact on the patient. Significant ear problems now affect more than 5% of the population [2].

The prominent ear originates from either underdevelopment of the antihelix or a larger conchal bowl. After a comprehensive assessment, surgical therapy of the prominent ear must be treated cautiously and logically [3].

Protruding ears are normal in size. However, the following abnormalities are seen: (1) A poorly formed helix and/or antihelix; (2) Excess conchal cartilage; (3) An increased angle of protrusion of the lobule; and (4) A thin, unrolled margin of the helix. The protruding ear deformity is usually bilateral [4].

Patient maturity, adequate ear development, consequent psychological stress burden, distortion of the ear cartilage, and flexibility development should all be considered when deciding when and how to intervene. Usually, deviations are in the dimensions of the outer ear reveal themselves at an early age. To minimize potential psychosocial stress, many surgeons recommend improving early childhood socialization [4].

After a thorough evaluation, surgical treatment of the prominent ear should be approached cautiously and rationally. Although the surgeon can enjoy the latitude offered by hundreds of reconstructive techniques, he must always proceed algorithmically using the technique most appropriate for a particular ear deformity. Using this approach,

correction of the visible ear can exceed patient satisfaction and maximize outcome predictably in terms of shape and symmetry [2].

The fundamental expertise of otoplasty is the surgeon's capacity to deeply comprehend the anatomy of the ear and use the procedure effectively to obtain maximum cosmetic outcomes. This understanding extends from the clinical assessment and anatomical basis to the surgical treatment of the deformed ear [4].

This article describes a straightforward surgical procedure to treat prominent ears in adults. With the help of the described method, 40 patients with prominent ears underwent otoplasty. The primary change was the use of cartilage rasping as the first step. Positive aesthetic outcomes have been observed in most patients with high satisfaction.

Aim of work:

The aim of this study is to evaluate the cosmetic outcome and satisfaction of people with prominent ears after otoplasty starting with cartilage rasping & assess the quality of life postoperative. This assessment of patient reported experience and outcome in the future can be used to improve quality.

Patients and Methods

Patients: Study targeted adult protruded ears patients admitted to El Demerdash Hospital and followed-up for at least 2 years at our outpatient clinic after receiving an agreement from the local ethical council of the College of Medicine at Ain Shams University.

Type of study: This is retrospective study.

Inclusion criteria:

- Males and females with prominent ears from 18 to 45 years old.
- Patient cooperative and fit for surgery.
- Ability to read and write.
- Willingness to participate in direct interviews
- Follow-up period 2 years at least.

Exclusion criteria:

- Less than 2 years follow-up.
- Patients with severe associated deformities e.g., hemi-facial microsomia.
- Non cooperative patients.
- Inability to understand the questionnaire.
- Associated medical conditions such as diabetes mellites or hypertension.

Methodology:

1- *Complete history taking:*

Personal history includes patient's age, sex, and history of medical importance.

2- *Preoperative assessment:*

A thorough preoperative examination and evaluation of the ear was undertaken in each patient. Preoperative planning and markings are done on the day of the procedure. The photographs would be taken pre- and postoperatively to document the preoperative condition and evaluate the outcomes compared with the findings of the preoperative condition with exceptional care to patient privacy.

3- *Intra operative:*

All our cases were done under general anesthesia. The first step of our modified otoplasty is the rasping of cartilage through a minimal incision in the posterior aspect of ear lobule. This anterior rasping is done to minimize cartilage memory and decrease the recurrence rate. 2.5cm lateral to the sulcus, a vertical incision is made in the posterior conchal skin. The helical rim, scapha, and mastoid fascia are then accessed by elevating the anterior and posterior skin flaps. Mustarde's scaphoconchal sutures are done, then Furnas concho mastoid sutures are done. All our sutures were permanent using prolene strands.

No skin excision was done to allow enough skin for knot coverage. The time limit of our surgery was about 25-35 minutes for each side. Average blood loss during surgery was about 50-100cc blood.

Follow-up was done in outpatient clinic. The skin sutures left exposed which make the patient more comfortable. With no need of compressive dressing. The follow-up duration will be at least 2 years after surgery, until all required data can be obtained from medical records which include history of surgery, examination, and complications.

All patients will be assessed via direct interviews by surgeons. The subjects will fill out the questionnaire by themselves. Face-to-face interviews will be conducted with the patients in their native language.

To avoid confusion about the anatomical structures, a picture of the ear with all the substructures outlined and labelled in simple words will be sent to patients before the interview. Patients will give the ratings as responses will use a five-point Likert-type scale ranging from 1 (very unsatisfied) to 5 (very satisfied) [6]. Each interview will take approximately 15min. Patient background information including gender, age, body mass index (BMI), and government will be recorded [7].

Two sections made up the questionnaire. Part One had 5 questions concerning respondents' satisfaction with their ears' overall appearance. Questions concerning how well the ear fits with the face were included in the second portion. Patients evaluated their experiences on a five-point Likert-style scale, with 1 being the least satisfied and 5 being the most satisfied.

Results



Pre-operative



Post-operative 2 years



Pre-operative



Post-operative 2 years

Fig. (1): 38 years old male with prominent ear underwent otoplasty.



Pre-operative



Post-operative 2 years

Fig. (2): 18 years old male with unilateral protrusion (left side) underwent otoplasty.



Fig. (3): Distance between midlines and mid-point of helical rim.

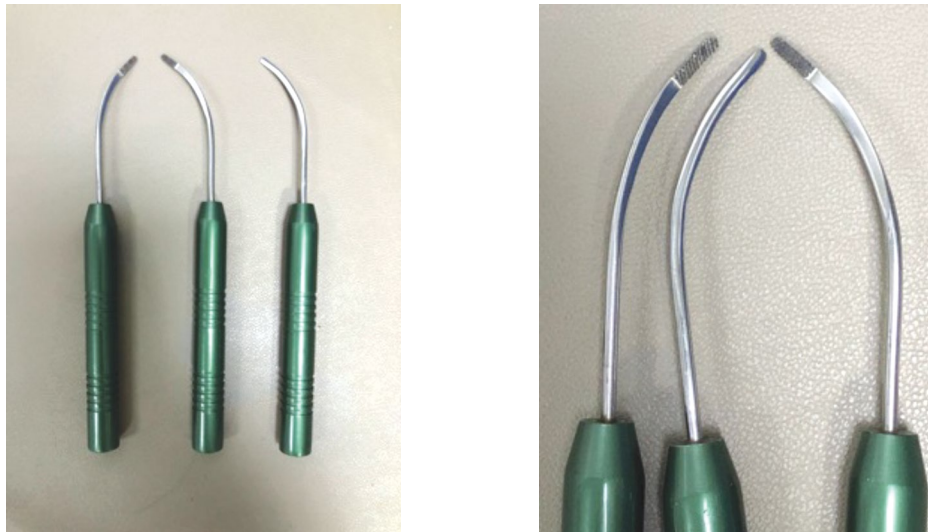


Fig. (4): Kistler antihelix cartilage rasp.



Fig. (5): 32 years old male with prominent ear underwent otoplasty.



Fig. (6): 20 years old male with prominent ear underwent otoplasty.

Table (1): Outcome of questionnaire assessing the post operative patient’s satisfaction.

	Satisfaction score Right ear	Satisfaction score Left ear
<i>Ear in general:</i>		
Median (IQR)	4 (3-5)	4 (3-5)
Range	2-5	3-5
Unsatisfied	4 (10.0%)	3 (7.5%)
Satisfied	36 (90.0%)	37 (92.5%)
<i>Ear fitting with face:</i>		
Median (IQR)	4 (3-5)	4 (3-5)
Range	3-5	2-5
Unsatisfied	2 (5.0%)	4 (10.0%)
Satisfied	38 (95.0%)	36 (90.0%)

Table (2): The distance from midline to the mid helical rim point pre and post operative.

Distance	Pre-operative	Post-operative	Independent <i>t</i> -test	
			Test value	<i>p</i> -value
Range	4.5-5.5	3-4	4.5870	<0.001
Mean ± SD	4.5375±0.4841	3.52±0.55		

Table (3): The long distance from mid-point of helical rim to midline divided by the short distance pre and post operatively.

	Pre-operative		Post-operative	
	Long distance	Short distance	Long distance	Short distance
Range	4.5-5.5	3.5-4.5	3.5-4.5	3-4
Percentage of division	1.25		1.14	
Mean ± SD	4.875±0.425	3.875±0.425	3.875±0.425	3.395±0.427
<i>t</i> -test	7.4652		3.5158	
<i>p</i> -value	<0.001			

Discussion

Gibson and Davis 1957 theory of that cartilage incised on one side has the ability to warp to the opposite side (bend away from the abraded perichondrium). Stenstrom in 1964 was the first to rasp the anterior surface of the cartilage to create antihelix. Chongchet and Crilelair separately in the same year scored rather than rasped the anterior cartilage of the protruded ear.

One of the most often employed processes in various centers is Chongchet's technique [14,19]. Its key benefits include the ability to simultaneously cure deep conchal abnormalities and an unfolded antihelix as well as the fact that no cartilages are removed, thus there are no superfluous skin folds on the conchal and scaphal regions. In his initial description of his technique in 1963, Chongchet claimed that he used anterior scoring and extensive posterior dissection, where he sutured the free cartilage edge.

Weakening of the cartilage alone was found to be not enough to correct protrusion, therefore Mustarde sutures were added (Mustarde 1963), Furnas 1968 and Spira 1969 choncho-mastoid fixation sutures were added.

In all these classic techniques the anterior scoring comes after posterior skin incision and elevation of anterior and posterior supraperichondrial skin flaps posteriorly to expose the sites of Mustarde and chonchimastoid sutures inserted. After this exposure, the anterior scoring is performed through a puncture in the lower most part of the cartilage to reach the anterior surface. After the rasp is completed the fixation sutures are taken and the skin is closed.

The modification described here in this article was to rasp the anterior surface of the cartilage first by doing a posterior skin-cartilage puncture to access the anterior surface of the cartilage and complete the rasping before any skin incision. This technique enables the cartilage to be more flexible and decreases bleeding and decreases the cartilage memory to prevent recurrence.

Anterior rasping by using the rasping instruments designed especially for it did not endanger the vascularity of anterior skin over the antihelix. Rasping allowed using smaller size prolene suture (prolene 5/0 and 6/0) with decreased incidence of suture exposure.

Using anterior rasping as first step decreased bleeding with average blood loss 50-100cc blood, so no adrenaline was injected in the beginning of surgery. We have no need to use compressive dressing, so light dressing prevented any vascular compromise of the anterior skin over the antihelix with sutures left exposed.

Re-protrusion of the ear is considered the most common complication which occurs after otoplasty. In our technique, the anterior rasping usually decrease the cartilage memory which decrease the recurrence rate.

Regarding results of satisfaction of the surgical outcomes in current study, most of the people were satisfied with the ear in general and distributed as (90%) were satisfied with right ear and (92.5%) were satisfied with left ear. However, all people were satisfied with the ear fitting with face as (95%) were satisfied regarding right ear and (90%) regarding left ear.

Regarding comparing the distance from midline to mid-point of helical rim pre and post otoplasty, we found that there is a statically significant difference between pre- and post-surgery (p -value less than 0.001) which indicate the efficacy of otoplasty in decreasing the distance from helical rim to midline and achieving a highly aesthetic outcome with high post operative patient's satisfaction Table (2), Fig. (4).

We also divided the long distance from mid-point of helical rim to midline by the short distance and compared it pre and post operative Table (3), the percentage of division was about 1.25 preoperative and about 1.14 post operative. The percentage has decreased post operative from 1.25 to 1.14 which clarify the efficacy of rasping, but also illustrate the non-satisfaction of some patients post operative with ear in general (10% right ear, 7.5% left ear) or ear fitting with the face (5% right ear, 10% left ear%). This measurement assesses the symmetry pre and post operative, decreasing the percentage of division post operatively indicate the improvement of symmetry and keep this symmetry for at least 2 years post operative which approve the adequacy of weakness of cartilage memory which improve the symmetry and maintain it.

Most studies in literature analyzed the initial postoperative phase. Only a few research [20] included results that were late. The deficiency of late follow-up was due to low patient concern about minor deformities if their general appearance was satisfactory. So, in our research we evaluated the result of 2 years post operative and divided the long distance from mid-point of helical rim to midline over short distance to analyze the maintenance of our technique in achieving aesthetic results.

Conclusion:

Adults' cosmetic results are improved when rasping is used as the initial stage in otoplasty. By reducing cartilage memory, anterior rasping reduces blood loss, shortens the duration of surgery, and lowers the chance of recurrence. Proper weakening of the cartilage by anterior rasping enhanced and preserved the symmetry while correcting the protrusion.

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