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Perichondrium Disorganization and Otomodeling: Approach update to protruding ear correction

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ABSTRACT: This study aims to explore the combination of perichondrial disorganization and otomodeling techniques in the treatment of prominent ears. Perichondrial disorganization involves the controlled modification of the tissue covering the auricular cartilage to allow remodeling of the ear, while otomodeling focuses on manipulating the cartilage to mold it according to the desired shape. The combination of these approaches has the potential to offer more lasting and aesthetically satisfactory results, by improving the accuracy of ear modeling and reducing the likelihood of recurrence of the deformity. The objective is to evaluate the effectiveness of the combination of these techniques in the correction of prominent ears, offering a safer alternative and effectiveness in preventing relapse.

KEYWORDS: Prominent ears. Facial harmonization; minimum intervention

I. INTRODUCTION

Protruding ear is a congenital deformity of the ear that can be corrected by otoplasty. Otoplasty, a surgery designed to correct auricular deformities, such as prominent ears, is one of the most common procedures in plastic surgery [1]. The main goal of otoplasty in correcting protruding ear is to restore the anatomy and remove the stigma of patients with this deformity. The surgical techniques seek a natural result, symmetry, minimal complications, low recurrence, and rapid recovery [2].

In recent years, perichondrium disorganization and the otomodeling technique have emerged as important approaches to improve the aesthetic results and functionality of otoplasty. The main characteristics of otomodeling are that it does not involve incisions or scraping at the cartilage level, using subcutaneous transfixation of non-absorbable and permanent sutures, enabling a more promising result with more advantages for the professional and patient. And, perichondrial disorganization is a technique that involves making cuts or partially removing the perichondrial layer during surgery [3,4].

This article reviews the relevance of these techniques and their effectiveness in preventing relapse.

II. PERICHONDRIUM

The Role of the Perichondrium

The perichondrium is a layer of connective tissue that surrounds the ear cartilage and plays critical roles in nourishing, supporting, and protecting the cartilage. It is composed of connective tissue, being richer in type I collagen fibers in the superficial layer, called the fibrous perichondrium. As it approaches the cartilage, the perichondrium becomes progressively more cellular, forming the cellular perichondrium. The cells present in the perichondrium are similar to fibroblasts, but those located closest to the cartilage have the ability to divide by mitosis, characterizing themselves as chondroblasts. The perichondrium contributes to growth, structural stability, and regeneration and maintenance of the organ [5].

During otoplasty, manipulation of the perichondrium is essential to allow the cartilage to remodel into the new desired position. Control of vascularization and tissue adhesion is essential for a satisfactory surgical result [6].

Disorganization and reorganizationof the Perichondrium

Perichondrium disruption is a technique that involves making cuts or partially removing the perichondrial layer during surgery. This procedure facilitates healing and adhesion of the cartilage to the new configuration, thus reducing the possibility of recurrence [4].Studies have shown that disorganization of the perichondrium not onlyimproves healing, but also contributes to more satisfactory ear aesthetics [7,8].

The perichondrium plays a dual role in the healing of cartilage wounds. On the one hand, the inner layer of the perichondrium, adjacent to the

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cartilage, provides (over time) cells for the formation of new cartilage. On the other hand, the outer layer rapidly produces fibrous growth, preventing the good cartilage-cartilage bond required to restore the mechanical function of the structure [9,10]. Initially, a local inflammatoryresponse occurs, with an increase in inflammatory cells to remove debris from damaged cells and initiate repair. Then, fibroblasts and chondroblasts (cartilage-forming cells) begin to migrate to the site of injury, stimulated by the microenvironment and growth factors. These fibroblasts produce new collagen fibers and other components of the extracellular matrix (ECM), which promote adhesion between the perichondrium and cartilage. Reorganization of the perichondrium occurs in parallel with remodeling ofthe cartilage, promoting robust and resistant healing [11]. Over time, it firmly reattaches to the cartilage, keeping the ear in the new position and allowing stability of the shape achieved during surgery [12].

III -OTOMODELING

Step by step of the technique:

1- Strict antisepsis and placement of disposable sterile fields.

2- Demarcation of the antihelix with a fine/thick double-tipped methylene blue surgical pen.

3- Anesthesia injected into the antihelix for analgesia, expansion and displacement of the skin.

4- Thread insertion: The first stitch was transfixed in the skin of the anterior surface of the auricle and the cartilage of the scapha, passing through the cartilage and skin of the concha, without transfixing the skin of the retroauricular region; transfixation of the skin in the anterior region of the concha. Needle is returned through the same hole until it pierces the conchal cartilage and skin, continuing to the scapha region. By piercing only the skin, it returns to the initial region, forming a “square design”. Subdermal needle transfixation to hide the stitch and cut very close to the skin. Observation of the positioning and posterior displacement of the auricle and formation of the new antihelix. 2 to 3 stitches were performed per ear.

5- Postoperative: Dressing with sterilized compressive gauze and micropore tape. It is recommended to change the band once a day to clean the ear and use it for 15 days throughout the day and 50 days at bedtime, aided by a tennis-type band around the head.

IV - EVIDENCE AND STUDIES

The prominent ear is a type of congenital ear deformity that can be corrected by a variety of nonsurgical treatments, such as splinting and the taping method. However, there is no objective evaluation method that is universally accepted [13].

The most suitable surgery for ear correction was one that was easily reproducible, versatile, simple and that achieved good results with few complications. Thus, combined treatment can be a resolving option for different cases [14].

The effectiveness of perichondrium disorganization or conservation in otoplasty has been the subject of several studies [4,15,16]. Furthermore, incision-free techniques, in the case of otomodeling, are outpatient procedures with minimal morbidity, requiring minimal postoperative care and are well tolerated by patients. Long-term reliability, low complication rates, cost-effectiveness and high patient satisfaction prove the indication for the combination of these techniques for the treatment of protruding ears[17].This minimally invasive approach can achieve these goals with excellent long-term aesthetic outcomes [18].

V - CONCLUSION

Perichondrial disorganization and otomodeling are complementary approaches that can improve the success of otoplasty. The combination of these techniques can result in better aesthetic outcomes and greater patient satisfaction. Perichondrial manipulation to promote better healing and otomodeling, a conservative, simple and versatile technique, has a high degree of patient acceptance, a low recurrence rate and optimization of surgical time.

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