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EDITOR'S INVITED COMMENTARY

Invited Discussion on Aesthetic Otoplasty: Principles, Techniques, and an Integrated Approach to Patient Centric Outcomes

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

The authors have prepared an exhaustive overview of the treatment of prominent ears, to include their thoughts on the pathophysiology of prominent ears, non-surgical intervention, otoplasty candidates, surgical management or the prominent ear deformity, and outcomes. The present discussion will focus on a few key points that might have been further clarified so that the reader could best assimilate the exhaustive review that the authors have attempted to complete.

Methods

The authors conducted a literature review through PubMed using six search terms, all of which contained the word "otoplasty." On attempting to reproduce this search in PubMed, 523 articles appear from 1915 to 2019. The majority of these articles are Level V evidence, and attempting to develop a systematic set of guidelines or recommendations by collating these articles would be very difficult. The authors have cited 66 publications, yet they do not indicate how they chose to select these publications, nor how they chose to focus on specific techniques from these publications. A meta-analysis was not performed, so their method of analysis cannot be reproduced.

Results

(a) *Pathophysiology* The authors comment on the role of maternal estrogens in malleability of the ear in utero and during the first 6 weeks of life, and comment on the application of non-surgical intervention during the first 6 weeks of life in correcting the prominent ear deformity. These observations would suggest that the prominent ear deformity may largely be due to malposition of the auricle in utero and in the neonatal period, or else it could not be corrected with ear molding alone during the first 6 weeks of life. This should be taken into consideration when considering techniques that alter the surface area of cartilage (e.g., conchal reduction) rather than the shape of the cartilage. In addition, the authors comment on the role of the post-auricular muscles in the prominent ear deformity. This is largely speculative, and I would suggest that the reader focus on the anatomic findings relayed in the article rather than speculation given the large volume of Level V evidence which the authors used to produce this work.

(b) *Otoplasty candidates* The authors state that "Recent studies have examined the ideal timing for otoplasty and suggest it should be performed before 4 years of age… [1, 2]". However, the studies cited do not make this claim. Gosain et al. [1] surveyed 481 senior plastic surgeons, all of whom were members of the American Association of Plastic Surgeons, and received 175 responses. The majority (57%) of respondents routinely perform surgery when their

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patients are 5 years of age and older. These respondents gave the following reasons for delaying otoplasty until this age: (1) near-adult size of the ear (38%); (2) greater patient cooperation (25%); (3) increased peer ridicule (19%); (4) decreased risk of general anesthesia (18%); (5) patients are more aware of their self-image (15%); and (6) traditional teaching is to perform otoplasty at age 5 years or older (8%). Only four respondents stated that they routinely perform otoplasty at any age. However, these respondents all indicated that they perform otoplasty only when the patient requests correction. This suggests that most of these patients were age 5 years or older, because in our experience, younger children do not pursue consultation on the basis of a patient-initiated request. Hao et al. [2] surveyed 45 patients who had otoplasty between ages 4 to 16 years, which would suggest that a minority of these patients were under age 5 years at the time of the survey. The improvement in self-image reported by these patients was not correlated to the age of otoplasty, nor was the age of otoplasty reported. Therefore, one must conclude that, although otoplasty can be reliably performed at age 4 years or less [1, 3], it is not the standard of practice. Whether otoplasty at this age should be recommended requires a discussion between surgeon, parents, and patient. Since a child 4 years or younger is usually not aware of the implications of prominent ears, one would be justified in stating that the decision is usually made independent of the child's wishes, and it would therefore be reasonable to delay the age of otoplasty until the child reaches the age of assent.

(c) *Surgical Techniques* The authors describe historical techniques, current techniques, and new innovations. They divide current techniques into sculpting, suturing, and combinations of the two. They go on to discuss "New innovations" covering a plethora of techniques currently used in otoplasty. However, it is not clear how the authors selected the techniques described as new innovations. I would suggest that readers critically evaluate the outcome of each technique, and determine which techniques they wish to incorporate in their own practice. Such techniques are outlined in multiple articles, and an article based on a PubMed review of the literature will have difficulty in conveying the merits of any given technique. I point the readers to a sequence of steps to address the key components of otoplasty, which is best demonstrated in both written and video communication [4, 5]. The authors review new innovations for specific components of otoplasty. The lobule is particularly difficult to correct, since there is no cartilage framework by which to support the repositioned lobule. The authors cite techniques for skin manipulation to correct the prominent lobule, but fail to mention the recurrence of skin-only techniques due to skin stretch. I point the reader to techniques that utilize the mastoid fascia to secure the repositioned lobule [6]. One can only assume that if skin-only techniques are now historical for repositioning the prominent ear, they should also be re-evaluated as the sole correction for the prominent lobule.

(d) *Outcomes* The authors state that "long-term outcomes are good in many of the otoplasty techniques described." However, a recurrence rate of 8% requiring surgical revision was reported in the survey of otoplasty returned by 175 members of the American Association of Plastic Surgeons [1]. Readers should be cautioned to expect some degree of recurrence with any technique utilized, and Level I evidence is lacking in determining recurrence rates specific to any given technique.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflicts of interest to disclose.

Human and Animal Rights This article does not contain any studies with human participants or animals performed by any of the authors.

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