

Health-related quality of life outcome of children with prominent ears after otoplasty

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Abstract To investigate health-related quality of life changes that occurred in children with prominent ears applied pre- and postoperatively. A prospective study was performed in 67 consecutive children who underwent otoplasty procedures between April 2008 and July 2010 and followed up for more than 2 years. Evaluations and interviews performed in the pre- and postoperative periods included the patients' history, clinical and routine laboratory examinations. Glasgow children's benefit inventory was the basis of the used inquiry for detecting the changes in health-related quality of life after otoplasty. For the children's cohort, the mean total Glasgow children's benefit inventory score was 23.9 ($p < 0.001$), indicating a benefit from the operation. All Glasgow children's benefit inventory subscores (emotion, physical health, learning, and vitality) were raised (mean 30.84, 14.98, 18.89, and 23.96, respectively). The health-related quality of life was raised in 63 of 67 children (94.03 %). Negative Glasgow children's benefit inventory scores or subscores were not found in a single case. Otoplasty can significantly increase patients' health-related quality of life and leads to a high rate of patient satisfaction in children with prominent ears.

Keywords Otoplasty · Protruding ear · Pinnaplasty · Bat ear · Quality of life · Long-term

Introduction

The prominent ear's physiological consequences are insignificant; however, the psychological and aesthetic consequences for the patient can be considered important [1]. Decreased self-esteem, increased anxiety, behavioral problems and social avoidance may result from disfigurement. Especially prominent ears may provoke ridicule and result in significant emotional disturbance [2]. Sarwer et al. [3] demonstrated that dissatisfaction with body image is a strong motivational factor for cosmetic surgery.

Outcome research has lately focused on the results of therapies focusing primarily on satisfaction and quality of life (QOL). Health-Related Quality of Life (HRQOL) examinations may help to corroborate the entitlement of surgical procedures in addition to clinical effectiveness [4]. Although there is no standard for measuring HRQOL, it is generally agreed that HRQOL is a multidimensional item, which includes physical, psychological and social aspects [4, 5]. Today, HRQOL is considered by many to be the most important parameter in the evaluation of a therapy regimen, particularly in aesthetic surgery, with its main aim being to produce a subjective benefit for the patient [5].

Although there are several studies to assess the impact of surgical intervention using objective measures, there have been few studies regarding the impact of otoplasty on patients' body image and QOL [6–9]. The aim of our study is to investigate body image and QOL changes that occurred in children with prominent ears applied preoperatively and 2 years after otoplasty surgery.

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Table 1 Glasgow children's benefit inventory scores of children after otoplasty

	Total score	Emotional subscore	Physical health score	Learning score	Vitality score
Mean \pm SD (min–max)	23.89 \pm 18.4 (0.0–63.2)	30.84 \pm 25.2 (0.0–72.4)	14.98 \pm 9.1 (0.0–40.8)	18.89 \pm 16.4 (0.0–64.3)	23.96 \pm 23.2 (0.0–79.9)
95 % CI	16.7–23.8	23.6–31.2	14.2–16.4	16.3–22.4	16.2–29.2

Materials and methods

Study design

A total of 112 children who underwent otoplasty procedures between April 2008 and July 2010 were included in the study. A prospective study was performed in 67 of them who followed up for more than 2 years and whose parents consented for the study. All procedures were performed by the senior author (M.S.). Forty-nine of these 67 patients were operated with Negrevergne otoplasty technique [2], while 18 of them were operated with combined Mustardé and Furnas otoplasty procedure [1].

Evaluations and interviews performed in the pre-and postoperative periods included the patients' history, clinical and routine laboratory examinations. In the interviews of the children and their parents or guardians, observations and complaints related to the problems associated with prominent ears were noted and the deformities were documented by photography.

Glasgow children's benefit inventory

Glasgow children's benefit inventory (GCBI) is constructed as an analog to the Glasgow benefit inventory (GBI) but consists of 24 questions and is answered by the patient's parents; in addition to a total score (ranging from -100 to $+100$), the following subscores can be calculated: emotion, physical health, learning, and vitality [10]. GCBI interviews were performed in the preoperative period and 2 years after surgery. The scores represent changes from previous measurements.

Statistical analysis

Results were analyzed using the Statistical Package for the Social Sciences for Windows (SPSS 16.0). Statistical analysis was performed on pure scores in the descriptive phase using basic statistics including mean, standard deviation, median and percentages. For the comparison between pre- and postoperative phases, nonparametric sign test for the median was used. Significance was set at a p value of 0.05.

Results

Otoplasty has been performed solely in 51 patients and concurrently with other procedures (adenoidectomy alone or in combination with tonsillectomy) in 16 patients. The mean age was 7.4 ± 2.8 (range 5–14) years, with a follow-up of 35.12 ± 11.04 (range 26–54) months. The study enrolled 67 of 134 patients who underwent otoplasty procedures in our tertiary care center.

For the children's cohort, the mean total GCBI score was 23.9 ($p < 0.001$) (Table 1), indicating a benefit from the operation. All GCBI subscores (emotion, physical health, learning, and vitality) were raised (mean 30.84, 14.98, 18.89, and 23.96, respectively). The HRQOL was raised in 63 of 67 children (94.03 %). Negative GCBI scores or subscores were not found in a single case. As was the case for the adults' cohort, no significant differences were calculated between the sexes (not shown); 94.03 % of the parents and 94.03 % of the children were satisfied with the aesthetic result, and 97.01 % of the parents and 89.55 % of the children would again decide in favor of the operation.

When the study cohort was evaluated with respect to the type of surgical procedure performed, two subgroups were observed: the cartilage cutting method group (Negrevergne otoplasty procedure) ($n = 49$) and the suturing method group (Mustardé and Furnas otoplasty procedure) ($n = 18$). As for the type of surgery, no difference was observed between groups in GCBI scores ($p = 0.246$).

When the study cohort was evaluated with respect to the presence or absence of the additional surgical procedure performed, two subgroups were observed: isolated otoplasty group ($n = 51$) and otoplasty + additional surgery group ($n = 16$). No difference was observed between groups in GCBI scores ($p = 0.342$).

Discussion

The aim of the current study was to evaluate and assess patients' body image and QOL after corrective surgery for prominent ears. Based on subjective evidence and

significant results, it may be concluded that otoplasty is useful in improving body image and QOL.

The results of the present study confirmed the hypothesis that surgery evokes positive changes in the quality of life. The patients feel healthier and more satisfied with their appearance. Meningaud et al. [11], examining outcomes after cosmetic surgery, confirmed the impression shared by the majority of studies: aesthetic surgery improves psychological well-being. Rankin et al. [12] described an improvement in composite quality of life scores in the early 1-month postoperative evaluation and state that this significant difference not only persisted at 6 months but also showed further improvement. Braun et al. [13] reported in a study of quality of life with 62 patients, using the GCBI, a satisfying quality of life for adults and children. Also, Schwendtner et al. [14] used in their study with 40 patients the GBI; they found an improvement of life quality after surgery on prominent ears. Toplu et al. [8] evaluated clinical results and HRQOL in 132 otoplasty patients in whom they used cartilage resection and suturing methods. Three months after surgery, in the adult (age > 13) group, the total score of the GBI was 32.4 in the cartilage resection group and 36 in the suturing group. In the children (age < 13) group, the total score of the GCBI was 26.8 (cartilage resection) and 38.2 (suturing). Both groups showed statistically significant increase after the operation. Hao et al. [9] reported HRQOL outcomes in 50 patients using GCBI and the Pediatric Quality of Life Inventory. Of those, 88 % reported being more satisfied with the appearance of their ears after otoplasty and 93 % would choose to have this procedure again if given a second chance. The mean GCBI total score was 24.4 and the mean Pediatric Quality of Life Inventory total score was 94.3 for the Child Self-Report and 93.3 for the Parent Proxy-Report, indicating a positive HRQOL outcome. In this study, parents reported a significant improvement in their children's health-related quality of life following otoplasty. The children themselves also reported having a generally high health-related quality of life after surgery. The present study determined mean GCBI total scores of 23.89. Appropriately, all children expressed a high rate of satisfaction with the results of the operation. The GCBI total score is comparable to the results found by Braun et al. [15] in 41 children (mean 24.1).

Children are very sensitive and know when they are accepted or rejected. The structure of their world, molded by their earlier phases of life, will be reinforced or modified in this period. The children can develop with a great ability to socialize and with wishes to co-operate with colleagues. But when rejected, they can develop negative and rebellious attitudes with the same intensity. Children with protruding ears are often exposed to substantial psychological pressure, such as being teased in school by and among their peers. Teasing even may occur within the family unit and can have

a serious impact on psychosocial development and behavior of the affected child [16]. In particular, children who present with some type of anatomic deformity, such as prominent ears, do not fit into the normal pattern or contemporary idea of beauty. Brazilian Multiprofessional Association for the Protection of Childhood and Adolescence reported that among interviewed students aged 11–14 years, more than 40.5 % admitted the presence of bullying or being victims of bullying [17]. Numerous studies attest to the psychological distress, emotional trauma and behavioral problems which this deformity can inflict on children. In a study by Sheerin et al. [18], a cohort of 47 children with prominent ears was evaluated preoperatively by a psychiatrist. Confirming the improvement demonstrated by the results of the tests in the current study, the testimonies in the postoperative clinical evaluations showed the satisfaction and happiness of the children and their parents or guardians.

Our study has several limitations. First of all, evaluation methods that use questionnaires have long been criticized as being susceptible to self-delusion, social circumstances, and social norms due to subjects being able to control their responses. Second, our study did not use a comparison group that was studied concurrently which makes it uncertain whether reported improvement in satisfaction and functioning can be attributed to the intervention. Third, we did not investigate maternal mental state, known to potentially bias assessment of children's health. Finally, we did not exclude patients who had concomitant procedures (adenoidectomy or adenotonsillectomy). It is possible that, although parents perceive there to have been a benefit of otoplasty, this may have resulted from their child's other surgery.

Recently, it is becoming increasingly important to quantify surgical procedures not only by qualitative issues but also by the patients' satisfaction measured with the aid of QOL questionnaires. Herein, we showed a long-lasting improvement in HRQOL after otoplasty for the indication of prominent ears.

Conflict of interest The authors declare no competing interest. No financial support was received for this paper. Authors indicate that they do not have a financial relationship with the organization that sponsored the research.

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