International Journal of Pediatric Otorhinolaryngology 79 (2015) 504–510

Contents lists available at ScienceDirect

International Journal of Pediatric Otorhinolaryngology

journal homepage: www.elsevier.com/locate/ijporl

Comparison of two incisionless otoplasty techniques for prominent ears in children

Suheyl Haytoglu [a], Tahir Gokhan Haytoglu [b], Nuray Bayar Muluk [c,*], Gokhan Kuran [a], Osman Kursat Arikan [a]

[a] Adana Numune Training and Research Hospital, ENT Clinics, Adana, Turkey
[b] Istanbul Training and Research Hospital, Department of Plastic, Reconstructive and Aesthetic Surgery, Istanbul, Turkey
[c] Kırıkkale University, Faculty of Medicine, ENT Department, Kırıkkale, Turkey

ARTICLE INFO

Article history:
Received 7 November 2014
Received in revised form 10 January 2015
Accepted 13 January 2015
Available online 20 January 2015

Keywords:
Incisionless otoplasty
Prominent ears
Visual analogue scale (VAS)
Global aesthetic improvement scale (GAIS)
Auriculocephalic distance

ABSTRACT

Objectives: In the present study, we applied two incisionless suture techniques for otoplasty: Haytoglu et al.'s modification of incisionless otoplasty technique and Fritsch's incisionless otoplasty technique for correction of prominent ears.

Methods: In this prospective study, 60 patients with prominent ears were included in the study. In Group 1, 55 ears of 30 patients (25 bilateral and 5 unilateral) were operated with Haytoglu et al.'s modification of incisionless otoplasty technique. In Group 2, 57 ears of 30 patients (27 bilateral and 3 unilateral) were operated with Fritsch's incisionless otoplasty technique. For comparison of two methods, auriculocephalic distances were measured at three levels which were level 1 (the most superior point of the auricle), level 2 (the midpoint of the auricle) and level 3 (level of the lobule) pre-operatively (preop); and measurements were repeated at the end of the surgery ($PO^{0\text{-day}}$), 1st month ($PO^{1\text{-Mo}}$) and 6th month ($PO^{6\text{-Mo}}$) after the surgery, in both groups. Patient satisfaction was evaluated using a visual analog scale (VAS). Moreover, Global Aesthetic Improvement Scale (GAIS) was rated by an independent, non-participating plastic surgeon at 6 months after the surgery.

Results: Operation time was 15.9 ± 5.6 min in Group 1 (Haytoglu et al.'s) and 19 ± 4.7 min in Group 2 (Fritsch). Hematoma, infection, bleeding, keloid scar formation, sharp edges or irregularities of the cartilage were not observed in any group. Suture extrusion was detected in 14.03% of Group 1 and 16.1% of Group 2. No statistically significant difference was observed between auriculocephalic distances at levels 1–3 of groups at preop, $PO^{0\text{-day}}$, $PO^{1\text{-Mo}}$ and $PO^{6\text{-Mo}}$ separately. Similarly, difference in auriculocephalic distances (preop values-$PO^{6\text{-Mo}}$ values) was not detected as statistically significant in Groups 1 and 2 at three levels. In both techniques, No statistically significant difference was observed in patient satisfaction at 6th months after the operation which was measured using Visual Analogue Scale (VAS) on 0 to 100 scales. According to GAIS, the patients were rated as 92.9% "improved" and 7.1% "no change" in Group 1; as 94.6% "improved" and 5.4% "no change" in Group 2.

Conclusions: Due to the similar results, Haytoglu et al.'s and Fritsch's incisionless otoplasty techniques are good options in the treatment of prominent ears, especially in pediatric patients with isolated inadequate development of antihelical ridge, and with soft auricular cartilage.

1. Introduction

Prominent ears are the most common congenital deformity in the head and neck region. Incidence for Caucasians are described about 5% and for microtia, it is 0.01% [1]. Otoplasty is now considered as a procedure with both aesthetic and functional purposes because it can lead a psychological trauma, especially in children being ridiculed by their peers [2]. By the age of 5, the development of the auricle nearly completed, it is an appropriate time to correct the prominent ear before the child start school [3,4]. Otoplasty is one of the most frequent aesthetic surgical procedures in children and adolescents. Several techniques can give satisfactory results, but few address all the components of the prominent ear deformity [5].

* Corresponding author. Tel.: +90 312 4964073/+90 532 7182441; fax: +90 312 4964073.
E-mail addresses: nbayarmuluk@yahoo.com, nurayb@hotmail.com (N. Bayar Muluk).

http://dx.doi.org/10.1016/j.ijporl.2015.01.014
0165-5876/

The first case for correction of congenital prominent ear had been published in 1881 [6]. The concept of restoration of the antihelical fold for prominent ear deformity was the first introduced by Luckett [7] who resorted to a cartilage breaching technique consisting of cresentic medial skin and cartilage excision along the entire vertical length and the antihelical fold. Parallel antihelical incision held together with permanent sutures was first described in 1952 in an attempt for softening the external ear contour and producing conical antihelical tube. This technique was later refined by Converse et al. [8] and further elaborated by others [9,10]. A well-known suture technique with open approach was described by Mustarde to create the anti-helical fold [11].

The open approach techniques have a potential of leading to complications such as keloid formation, bleeding, a visible scar and infection because of the skin incision [12]. To prevent these complications and to reduce the need of ear dressings incisionless otoplasty techniques were developed. Fritsch described an incisionless technique by placing the Mustarde sutures to create the missing antihelical curve with permanent subcutaneous sutures [13].

In recent years, incisionless suture techniques have been more common for correction of prominent ears. In the present study, we applied two incisionless suture techniques for otoplasty: Haytoglu et al.'s modification of incisionless otoplasty technique [14] and Fritsch's incisionless otoplasty technique [13]. For comparison of two methods, auriculocephalic distances were measured; and also VAS results were asked for patient satisfaction. Moreover, global aesthetic improvement scale (GAIS) was rated by an independent, non-participating plastic surgeon.

2. Materials and methods

This prospective study was conducted in Adana Numune Training and Research Hospital between November 2011 to February 2014 according to the principles of the Helsinki Declaration [15]. Ethics Committee approval of Adana Numune Training and Research Hospital was also taken. Patients were included in the study after signing informed consent by their parents.

2.1. Subjects

In total, 60 patients (26 female and 34 male) with prominent ears were included in the study. As incisionless otoplasty is effective in ears with soft cartilages, the patients under 18 years old were participated in this study. Sixteen male and 14 female patients were included in Group 1, and 18 male and 12 female patients were included in Group 2. Patients with psychiatric diseases, mental retardation, a previous otoplasty history, and craniofacial anomalies were excluded. The patients were randomly divided into two groups. In Group 1, 55 ears of 30 patients (25 bilateral and 5 unilateral) were operated with Haytoglu et al.'s modification of incisionless otoplasty technique [14]. In Group 2, 57 ears of 30 patients (27 bilateral and 3 unilateral) were operated with Fritsch's incisionless otoplasty technique [13]. Surgical procedures were performed by the first author (S.H.). In both groups, recurrence was observed in 3 ears; and corrected again using first applied techniques.

2.2. Surgical procedures

Under general anesthesia, the auriculocephalic distances were measured and recorded at three levels. The measurements were made along a hypothetical plane drawn from the lateral helical margin to the scalp. The measurements were made from level 1 (the most superior point of the auricle), level 2 (midpoint of the auricle) and level 3 (the level of the lobule). After determining the location of the sutures, the next step was scoring the cartilage.

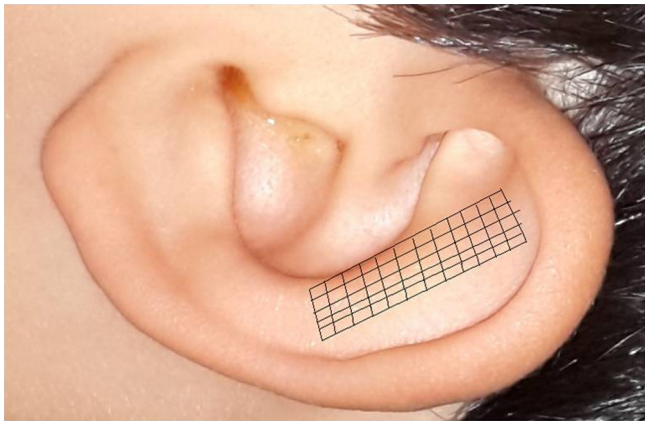

Fig. 1. Scoring the cartilage.

To weaken the cartilage, a 21-ga needle was used by creating a new curve to its tip (Fig. 1).

1. For Group 1, Haytoglu et al.'s modification of incisionless otoplasty technique [14] was performed (Figs. 2–4). After scoring the cartilage, the next step was placing the sutures. First, the needle enters the skin at a 90° angle from the posterior surface of the auricle to hide the suture knot behind the ear at the end of the operation. The suture penetrates the full thickness of the cartilage and exits from the skin in front of the auricle. The points where the sutures penetrate the cartilage are symmetrically above and below the desired new anti-helical curve. Also, the median point of the two needle holes is intended to be the peak point of the new anti-helical curve. Second, the needle reenters from the exact exit hole and it rises upwards, in front of the cartilage subperichondrially, and exits symmetrically from above the hole to the new anti-helical curve. Third, the needle reenters from the exact exit hole to penetrate the full thickness of the cartilage towards the posterior surface of the auricle to exit the skin. Fourth, the needle reenters the skin, at the posterior of the cartilage subperichondrially, leading downward, to the original first entry hole to exit. At this point, the suture is knotted and tightened. The number of sutures placed was mostly 2. The third suture was rarely required.
2. For Group 2, Fritsch's incisionless otoplasty technique [13] were performed (Fig. 5). The next step after scoring the cartilage was to create the suture loops with two short and two long limbs. For this purpose, the needle enters and exits the skin from the

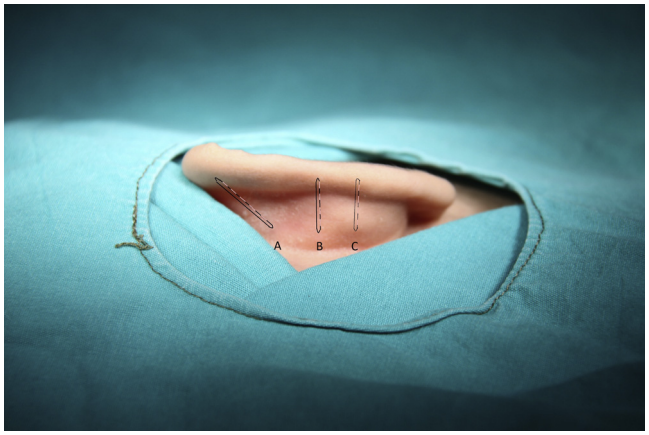

Fig. 2. The suture positions of Haytoglu et al.'s modification of incisionless otoplasty technique [14]. Dotted lines are in front of the cartilage, solid lines are in the rear of the cartilage.