

Original Article

Minimally Invasive Technique for Correction of Prominent Ear

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OBJECTIVES: Prominent ear is not an uncommon deformity with 5% prevalence in population worldwide. Although there is no physiological handicap in this deformity, it affects the psychology and social integration, especially in children. Many surgical techniques are performed to correct this deformity. In this study, we illustrate a minimally invasive technique in cases of prominent ear and evaluate its efficacy.

MATERIALS and METHODS: A total of 16 patients were operated by incisionless otoplasty in both ears simultaneously. Therefore, 32 ears were included in the study. Postoperative follow-up was carried out for 6 months to determine the efficacy of this technique, complications, and recurrence of the abnormal shape.

RESULTS: Two ears (2/32) were presented with slight protrusion three months postoperatively. Three ears had postoperatively exposed sutures that needed to be embedded again under local anesthesia. The satisfaction rate was found to be 88% by the visual analog scale. No perichondritis or other complications occurred postoperatively. The technique results in correction of the deformity without any visible evidence of surgery.

CONCLUSION: This technique is effective and safe for correction of prominent ear with negligible rate of complications and rapid recovery time.

KEYWORDS: Ear, auricle, deformity, technique

INTRODUCTION

Prominent ear is not an uncommon deformity. It affects about 5% of the population^[1]. It is presented by the absence of the anti-helix and deep concha with increase in auriculomastoid angle^[2]. Therefore, the goals of its correction involve the formation of the antihelix and reduction of the concha^[3]. Many surgical procedures and techniques were developed to correct this deformity, but the outcome, recurrence, and results remain unsatisfactory^[4]. An ideal technique is still missing. In this study, we present our case series of minimally invasive technique for the correction of prominent ear and we think it may be the best in comparison with other techniques.

MATERIALS AND METHODS

This study was conducted in our otorhinolaryngology department from January 2017 to August 2018. Sixteen patients were included. The age of the patients was between 8 and 33 years (15.31 ± 6.3); 11 were males and 5 were females. Both ears were operated simultaneously; therefore, a total of 32 ears were operated. The operation time was about 50 ± 13 minutes. There was no need for dressing or hospitalization postoperatively. The patients can return to work on the second day of surgery. They were followed up for 6 months postoperatively to see the results.

Technique

The technique is performed under general anesthesia; it can also be performed under local anesthesia especially in cooperative patients. We mark the site of anchoring sutures in the head surface of the auricle using a blue marker pen. Each auricle must have three anchoring remodeling sutures. The sites of the three sutures are marked by pushing the auricle medially against the skull.

The first suture is placed in the area of anterior helix to create a reasonable superior root of the antihelix. The second suture is placed in the upper part of the antihelix main stem. The third suture is placed in the lower part of the expected antihelix just above

the lobule and antitragus. Then, a local injection of saline adrenaline 1:100,000 is administered in both surfaces of the auricle.

Each suture passes through four points:

Point A, back of the concha

Point B, back of the concha 1 cm from point A

Point C, back of the scaphoid 1 cm from point B

Point D, back of the scaphoid 1 cm from point C

By using the tip of a surgical blade knife 15, we start to make about 1-mm incisions in the four points, especially entrance A, as it must be wider to embed the final suture inside it (Figure 1).

By using a small-tapered scissor passing through point A, we separate the skin from the underlying perichondrium between the four points.

We pass a curved needle of nonabsorbable 4/0 PROLENE® (Polypropylene sutures, Ethicon Inc, Bridgewater, New Jersey, United States of America) from point A to point B passing through the cartilage of the auricle, but we take care not to pass through the opposite surface of the auricle. We then pass the needle from point B to point C subcutaneously not passing through the cartilage. Then, we pass the needle from point C to point D through the cartilage. Finally, we return the needle from point D to point A subcutaneously not passing through the cartilage (Figure 2).

The entry and exit are through point A, and the thread is looped between the four points and is completely nonvisibly embedded. We ligated the suture several times (so that the tension of the suture will not be lost over time) and completely embedded it nonvisibly. We adjust the tension of the ligature as needed, and overcorrection is suggested because some relaxation may occur later in the tension of the suture during the first 3 months after surgery.

RESULTS

The patients were followed up for 6 months. There was no postoperative hematoma or extrusion of sutures. Three suture knots (at point A) protruded from the incision at 10 and 14 days postoperatively. We embedded them again under local anesthesia in the clinic. There was no perichondritis or granuloma formation during follow-up.

Protrusion is assessed by the distance between the mastoid and the most prominent point on the helix. When this distance is >25 mm, the ear is considered prominent. Therefore, we measured all cases postoperatively, and only two patients had prominent ears; the protrusion distances 3 months after the operation were 26 and 28 mm (slight protrusion) and needed reoperation. Tightening of the sutures was performed. Table 1 shows the preoperative and 3-month

postoperative protrusion. The preoperative protrusion distance was 28.625 ± 2.07 mm, and the 3-month postoperative protrusion distance was 18.094 ± 2.97 mm.

Almost all the patients, except two, were satisfied after the operation according to the visual analog scale.

DISCUSSION

Prominent ear is not an uncommon deformity with 5% prevalence in population. Although there is no physiological handicap in this deformity, it affects the psychology and social integration, especially in children. Therefore, surgery is usually required at even a younger age [1, 5]. Since the surgery was first performed by Diefenbach in 1845, many surgical techniques have been developed to correct this deformity. More than 200 techniques are in use for the correction of prominent ears, including the percutaneous technique, cartilage sparing, cartilage splitting, perichondroplasty, and incisionless and endoscopic techniques. The availability of various techniques suggests that there is no single globally accepted and ideal procedure [3, 4].

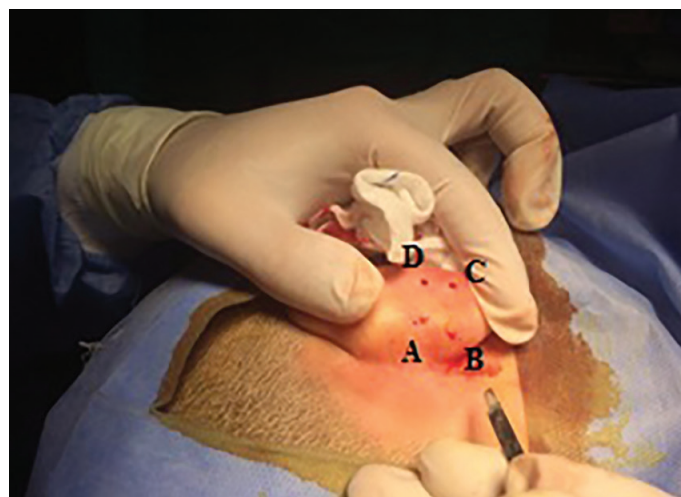


Figure 1. Four points of the suture entrance.

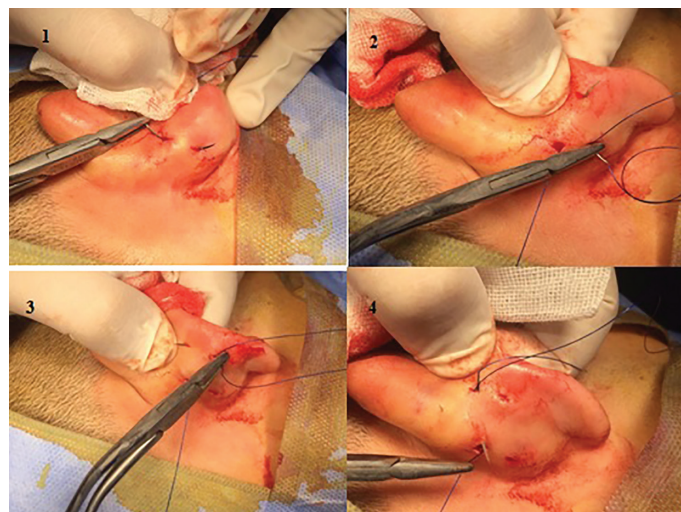


Figure 2. Passage of the suture between the four points, which is not visible externally.

MAIN POINTS

- This surgical technique is minimal invasive, effective, safe.
- It is cartilage sparing technique.
- Three anchoring sutures is required for each auricle.
- Sutures are embedded and nonvisible.

Table 1. Preoperative and 3-month postoperative protrusion

Patient	Ear	Preoperative protrusion (in mm)	3-Month postoperative protrusion (in mm)
1	Right	30	18
	Left	30	17
2	Right	27	17
	Left	28	17
3	Right	26	16
	Left	26	16
4	Right	31	17
	Left	30	18
5	Right	28	14
	Left	28	15
6	Right	32	28
	Left	33	21
7	Right	30	20
	Left	29	20
8	Right	27	19
	Left	27	18
9	Right	26	15
	Left	27	15
10	Right	31	26
	Left	31	18
11	Right	26	19
	Left	26	19
12	Right	27	17
	Left	28	16
13	Right	29	18
	Left	29	18
14	Right	26	20
	Left	27	21
15	Right	32	19
	Left	32	18
16	Right	29	15
	Left	28	14

The incisionless technique is also not completely new. It has been in use for decades including the anterior scoring and suturing percutaneously. Peled et al. [6] defined the technique for the antihelix, whereas Fritsch illustrated concho-mastoid and lobe sutures.

In our study, the mean age of the patients was 15 years. There were 11 males and 5 females. There are variations in the literature regarding the age of operation and sex according to each country because

the aesthetic complaint is the main indication for surgery. In the literature, the mean age of patients ranges from 7 to 38 years, and 35% to 70% are female patients, and this percentage increases after the age of 20 years [7].

The incisionless technique we are using is safe and easy to perform. It has less complications than other techniques described in the literature. It provides good results with natural appearance, and there is no need for dressing or bandage or hospitalization. Only 2 of the 32 (6.2%) ears had a slight protrusion and needed reoperation to just increase the suture tension. Three ears developed exposure of the suture knot, which were embedded again under local anesthesia in the clinic. There were no perichondritis or hematoma or other complications. Among the 16 patients, 14 were satisfied (88% satisfaction rate).

After analyzing the data of 3,493 patients in the literature who underwent otoplasty for prominent ear, Sadhra et al. [8] stated that the hematoma incidence ranges from 1.4% to 3.8%, infection from 0.4% to 1.3%, wound problems from 1.4% to 5.1%, suture problems from 0.8% to 2.6%, pain from 5.4% to 23%, and revision surgery from 2.9% to 7.7%

Regarding postoperative complications, Punj et al. [9] stated that bleeding occurred in 2.2%, wound infection in 0.9%, and recurrence rate in 10% in Chongchet technique and 2.9% in Mustarde technique. Both the techniques may need antiemetics (3.2% to 14.3%) and opioid analgesics (30% to 35%) postoperatively

Smittenberg et al. [10] reported a high percentage of complications in cartilage cutting. It was about 20%, of which 7% needed reoperation. Maricevitch et al. [11] reported a complication rate of 12.8%. Valentines stated that the complication rate is about 10%, and that 10% of these complications needed reoperation [12].

CONCLUSION

This technique is effective and safe for correction of prominent ear with negligible rate of complications and rapid recovery time.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of Ain Shams University School of Medicine.

Informed Consent: Written informed consent was obtained from the patients who participated in this study.

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