Aesth Plast Surg (2019) 43:1228–1232
https://doi.org/10.1007/s00266-019-01365-x

ORIGINAL ARTICLE FACIAL SURGERY

# Surgical Correction of the Lying Ear Deformities

**Tae Kwang Jeong[1] · Young Min Kim[2] · Kyung Hee Min[2]**


Received: 17 December 2018 / Accepted: 15 March 2019 / Published online: 3 April 2019


**Abstract**

*Background* In contrast to prominent ear, lying ear can be defined when the antihelix of the ear is excessively folded, i.e., the conchoscaphal angle is much less than 90°. In such case, ears may look smaller than the face. These patients want their ears to be exposed more. In Asia, there is also a tendency to prefer large and long ears. The objective of this study was to present a surgical method for correcting lying ear deformities.

*Methods* From August 2017 to June 2018, 37 patients (72 ears) underwent surgery using our surgical method for lying ear deformities. After the cartilage was exposed on the posterior auricular surface, the fibrous band present at the conchoscaphal angle was released. Two longitudinal cartilage incisions were performed along the border of the antihelix. Horizontal mattress sutures were performed on the cartilage until the conchoscaphal angle was close to 90°. Onlay cartilage grafting was performed for the most severe portion of the deformity.

*Results* We performed reoperation for four patients due to recurrence ($n$ = 2), under-correction ($n$ = 1), and cartilage exposure ($n$ = 1). Most patients obtained satisfactory aesthetic results.

*Conclusions* There have been few reports of the surgical method for lying ear deformities. Our surgical method can provide satisfactory clinical outcomes for correcting lying ear deformities.

*Level of Evidence IV* 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.

**Keywords** Ear · Cartilage · Otoplasty

## Introduction

Human ears have important aesthetic and cultural values. The shape and symmetry of auricles are vital for facial aesthetic harmony. Prominent ear is one of the most common congenital deformities of the head and neck, affecting approximately 5% of the population [1]. Prominent ears result from antihelical fold underdevelopment, conchal hypertrophy, or obtuse conchoscaphal angle [2]. In contrast, lying ear deformities result from excessive antihelical fold, i.e., a conchoscaphal angle much less than 90° [3]. In Asia, large and long ears are regarded as symbols of brimming wealth and health [4]. Patients with lying ears want their ears to be more exposed and show more prominently. So far, hundreds of surgical techniques for prominent ears have been described [5, 6]. However, few studies have reported the surgical method for lying ears [3]. Therefore, the objective of this report was to present a surgical method to correct lying ear deformities.

**Electronic supplementary material** The online version of this article (https://doi.org/10.1007/s00266-019-01365-x) contains supplementary material, which is available to authorized users.

✉ Kyung Hee Min
mkh797@hanmail.net

[1] HB Plastic Surgery Clinic, Seoul, Korea

[2] Department of Plastic and Reconstructive Surgery, Eulji University School of Medicine, Eulji General Hospital, 280-1 Hagae-dong, Nowon-gu, Seoul 139-872, Korea

## Materials and Methods

From August 2017 to June 2018, 37 patients underwent corrective surgery for lying ear deformity. Among these 37 patients, 29 patients were women and eight patients were men. The mean age of patients was 38 years (range 22–59 years). Of these 37 patients, 35 had bilateral ears and two had unilaterally affected ears.

### Operative Technique

With patients under local anesthesia, the incision line was marked on the posterior auricular surface. The incision line was at approximately 1 cm medial from the antihelical fold.

Dissection was performed to expose the cartilage on the supraperichondrial plane.

The border of the antihelix was projected at the posterior surface using a 25-G needle. The fibrous band was observed at the antihelical fold. This fibrous band could be the cause of lying ear deformity. Therefore, this tissue was released and cut completely. Two longitudinal cartilage incisions were performed along the border of the antihelix with an electrical cautery. Horizontal mattress sutures with 4-0 Nylon were then performed on the cartilage until the conchoscaphal angle was close to 90°. The surgical technique of horizontal mattress suturing is shown in Video 1. Length of cartilage incision and number of sutures depended on severity of the lying ear deformity. Onlay grafting using conchal cartilage or allogenic coastal cartilage, Tutoplast® (RTI surgical, Florida, USA), was performed for the most severe portion of the deformity through suturing with 5-0 Nylon (Fig. 1). The skin was closed with 6-0 Vicryl and 6-0 Nylon. Mild compressive dressing was then performed. Dressing was performed at one day after the operation to check for hematoma or skin necrosis. After that, dressing was performed once every three days. Stitches were removed at seven days after the operation.

## Results

For onlay grafting, conchal cartilage was used for seven patients and allogenic coastal cartilage was used for the remaining 30 patients. Almost all patients were seen at 1

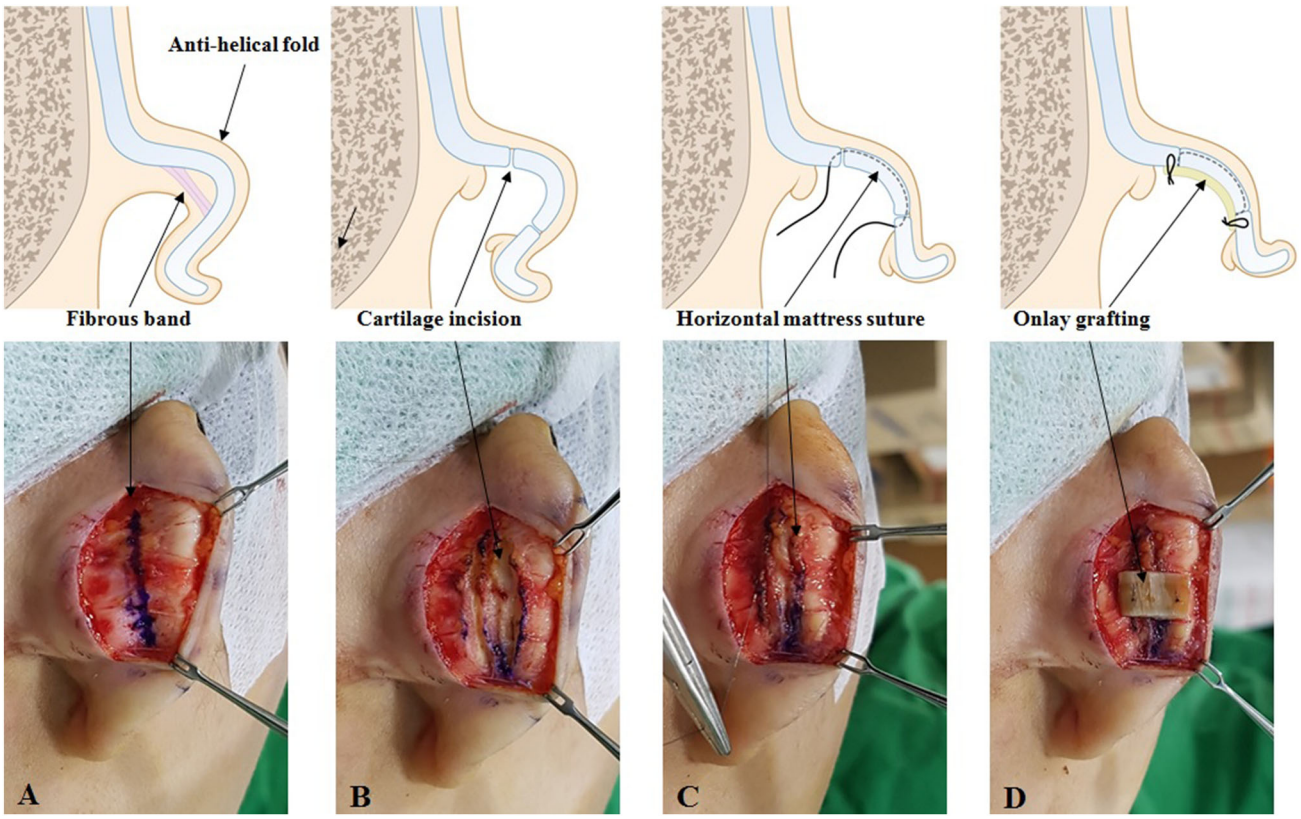


**Fig. 1** Illustrations and operative photographs of the procedure. **a** The fibrous band was observed at the antihelical fold. **b** Two longitudinal cartilage incisions were performed along the border of the antihelix. **c** Horizontal mattress sutures were performed on the cartilage until the conchoscaphal angle was close to 90°. **d** Onlay grafting was performed in the most severe portion of the deformity

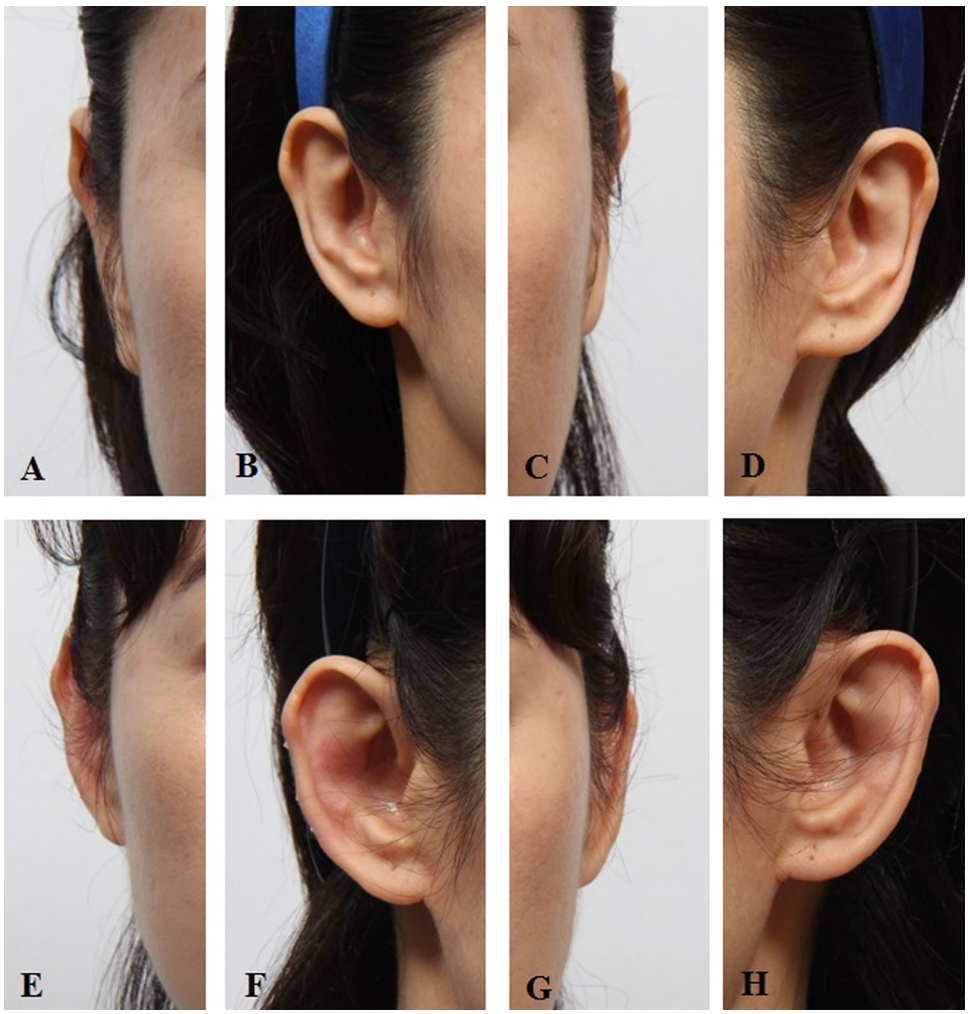


**Fig. 2** **a–d** Preoperative views of a 49-year-old female patient with laying ear deformity. **e–h** Postoperative 1-month views

and 3 months postoperatively. Most patients were satisfied with their aesthetic results (Figs. 2, 3). We performed reoperation in four patients due to relapse ($n$ = 2), undercorrection ($n$ = 1), or exposure of grafted cartilage (allogenic coastal cartilage) ($n$ = 1). For this graft exposure case, the exposed cartilage was resected and closed. No other complications occurred during the follow-up period.

## Discussion

The ear consists of a convoluted cartilage with thin skin cover. Anatomical variations exist among ears, although basic auricular dimensions are similar. Knowledge about normal ear anatomy and the relationship of the ear with the skull is crucial for diagnosis and treatment of ear deformities. Ear length in adults is 55–65 mm. Ear width is approximately 50–60% of its height. The auriculocephalic angle between the auricle and scalp at the helical root is typically 20°–30°. The conchoscaphal angle forming the antihelical fold is frequently 90° or less [7, 8]. The shape of the ear varies slightly depending on race. Choe et al. [9] have reported that Korean American women on average have longer ears that are less steeply inclined than North American white women. Also, large and long ears are preferred in Asia [4]. Therefore, patients with lying ear deformity may be dissatisfied with ears that are relatively smaller than the face.

Various surgical procedures for correcting the prominent ear have been introduced to the extent that otoplasty is referred to as the corrective method for prominent ear [5, 6].

In 1881, Ely [10] was the first to describe a procedure for prominent ear by excision of skin and cartilage. After that, in 1910, Luckett [11] found that prominent ear was due to failure to form the antihelical fold. He described making incisions on the cartilage to create the antihelical fold and setback of the ear by postauricular skin excision. In 1963, Mustarde [12] described the mattress suture technique to create a new antihelical fold. In addition, various surgical methods including conchal mastoid sutures

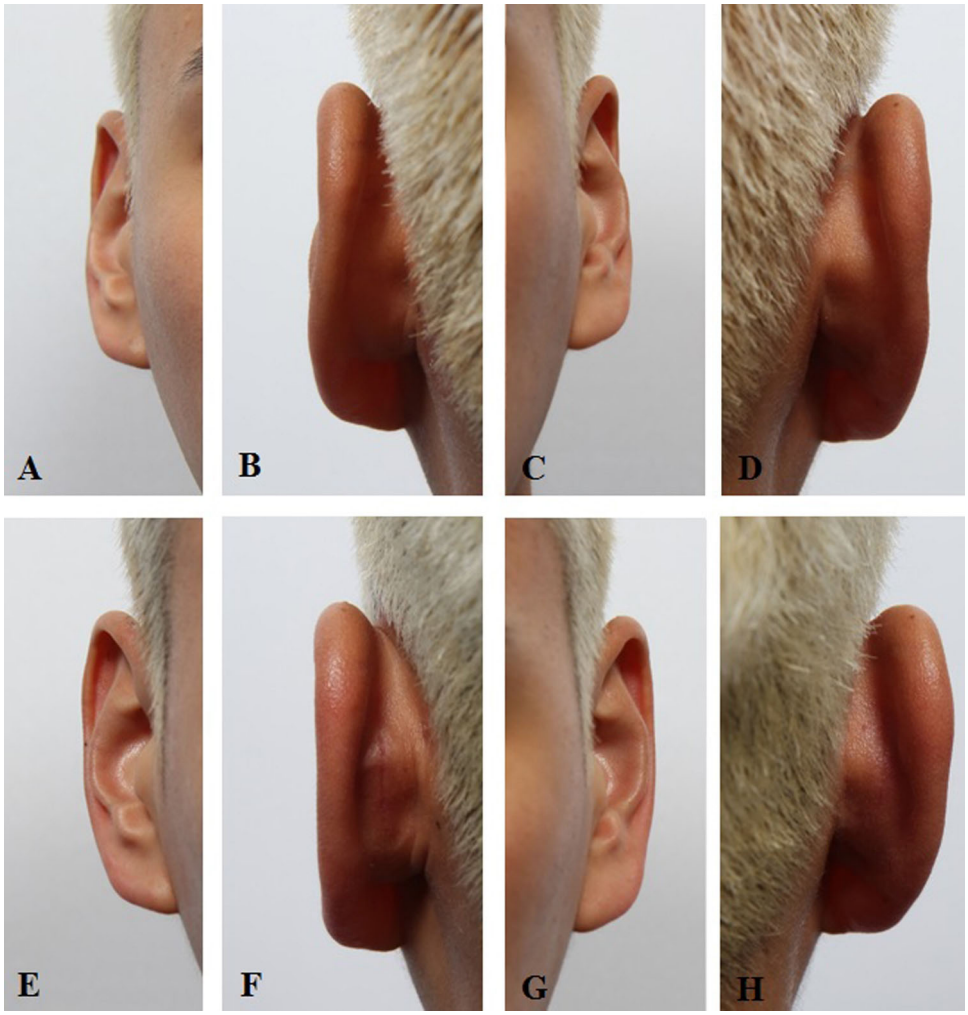


**Fig. 3** **a–d** Preoperative views of a 31-year-old male patient with laying ear deformity. **e–h** Postoperative 4-month views

and the cartilage scoring technique and a combination of these methods have been introduced [13–15].

Lying ear is similar to overcorrection, one of the complications of prominent ear treatment. Release of skin and cartilage adhesions, postauricular flaps, and skin or cartilage grafts have been reported as corrective methods for overcorrection deformity in prominent ear [16, 17]. Kim et al. [3] have reported a case of lying ears. They reported the correction of the conchomastoid angle by Z-plasty and resection of the posterior auricular muscle with augmentation of the conchoscaphal angle by two full-thickness incisions and grafting of conchal cartilage [3]. However, in our method, we could achieve good aesthetic results without correction of the conchomastoid angle. We did not perform skin local flap and muscle resection. We performed the correction only through the postauricular incision. Therefore, our method could have fewer complications, such as flap necrosis, hematoma, and scar formation.

We found that the fibrous band at the antihelical fold was the cause of lying ear. We released this band and remodeled the antihelical fold by cartilage incision with horizontal mattress sutures. In addition, the cartilage graft was performed to prevent relapse. Also, we corrected 37 patients of lying ear deformities with our method. As a result, there were few recurrences and good aesthetic results.

However, this study has some limitations. The quantitative data analysis and postoperative long-term follow-up were lacking. Therefore, in further studies, preoperative and postoperative objective data analysis, classification of severity, patient-reported outcome measures, and postoperative long-term follow-up are needed to demonstrate the effectiveness of our method.

## Conclusion

Lying ear deformity resulting from excessive antihelical fold could induce ears to seem relatively small. We corrected lying ear deformities through fibrous band release, cartilage incision, mattress sutures, and cartilage grafts.

Our method is effective and reliable for correcting lying ear deformities.

**Compliance with Ethical Standards**

**Conflict of interest** The authors have no potential conflicts of interest with respect to the research, authorship, and publication of this article to declare.

**Ethical Approval** All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

**Informed Consent** All patients provided written informed consent for the publication and the use of their images.

## References


1. Janis JE, Rohrich RJ, Gutowski KA (2005) Otoplasty (review). Plast Reconstr Surg 115:60e–72e
2. Sinno S, Chang JB, Thorne CH (2015) Precision in otoplasty: combining reduction otoplasty with traditional otoplasty. Plast Reconstr Surg 135:1342–1348
3. Kim SE, Yeo CH, Kim T, Kim YH, Lee JH, Chung KJ (2017) Correction of lying ears by augmentation of the conchoscaphal angle. J Craniofac Surg 28:254–255
4. Woo PN, Lip PL (1996) Why do old men have big ears? The Chinese believe that thick ears signify greater wealth. BMJ 312:582
5. Hoehn JG, Ashruf S (2005) Otoplasty: sequencing the operation for improved results. Plast Reconstr Surg 115:5e–16e
6. Foda HM (1999) Otoplasty: A graduated approach. Aesthet Plast Surg 23:407–412
7. Liaw J, Patel VA, Carr MM (2017) Congenital anomalies of the external ear. Oper Tech Otolaryngol Head Neck Surg 28:72–76
8. Janz BA, Cole P, Hollier LH Jr, Stal S (2009) Treatment of prominent and constricted ear anomalies. Plast Reconstr Surg 124:27e–37e
9. Choe KS, Sclafani AP, Litner JA, Yu GP, Romo T 3rd (2004) The Korean American woman's face: anthropometric measurements and quantitative analysis of facial aesthetics. Arch Facial Plast Surg 6:244–252
10. Ely ET (1881) An operation for prominence of the auricles. Arch Otolaryngol 10:97
11. Luckett WH (1910) A new operation for prominent ears based on the anatomy of the deformity. Surg Gynaecol Obstet 10:635–637
12. Mustardé JC (1963) The correction of prominent ears by using simple mattress sutures. Br J Plast Surg 16:170–178
13. Kaye BL (1967) A simplified method for correcting the prominent ear. Plast Reconstr Surg 40:44–48
14. Furnas DW (1968) Correction of prominent ears by conchomastoid sutures. Plast Reconstr Surg 42:189–193
15. Elliott RA (1990) Otoplasty: a combined approach. Clin Plast Surg 17:373–381
16. Szychta P, Orfaniotis G, Stewart KJ (2012) Revision otoplasty: an algorithm. Plast Reconstr Surg 130:907–916
17. Lentz AK, Plikaitis CM, Bauer BS (2011) Understanding the unfavorable result after otoplasty: an integrated approach to correction. Plast Reconstr Surg 128:536–544