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Incisional Ptosis Correction with Hidden Double Fold in Asian Patients

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Abstract

Background Korean males and a few females desire to have larger eyes; however, they often wish to enlarge their eyes and conceal their double eyelids. This paper attempts to describe how to make the eyes bigger and brighter without showing double-fold eyelids.

Methods The authors performed cosmetic ptosis correction in 121 cases from April 2013 to December 2017. All patients enrolled in this retrospective study underwent surgical procedures at the author's institutions. Patients were included that had mild-to-moderate degrees of ptosis and levator function greater than 5 mm, ages greater than 16 years, and no prior ptosis surgery.

Results A successful outcome was achieved with this surgical approach in 113 (93.4%) patients. Complications potentially associated with ptosis surgery were not observed.

Discussion A refined method of preoperative evaluation for incisional ptosis correction to conceal a double fold with no visible signs of surgery is described. Ptosis correction without the formation of double eyelids will result in skin hooding and visible scarring, and thus, it is recommended to lower the height of the double eyelids. The lower height of double eyelids can cover the incisional scar and make it appear there are no double eyelids.

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 Blepharoptosis · Hidden double fold · Eyelids · Blepharoplasty

Introduction

Korean patients with blepharoptosis have unique characteristics that differ from those of Caucasian patients [1]. Slightly decreased levator function and thick and puffy eyelids are distinct and unique characteristics of blepharoptosis in Korean patients [1]. In particular, Korean males and a few females desire larger eyes, but they often wish to enlarge their eyes without creating double eyelids. This requirement depends on the race; indeed, some Koreans consider a double eyelid as too unnatural or flirtatious, especially if the double eyelid is noticeable, or if the double eyelid is thick. Several surgical techniques exist for blepharoptosis correction, although it is well known that with blepharoptosis correction surgery, a double-folded line is inevitable [2]. This paper attempts to explain how to make the eyes bigger and brighter while concealing double eyelids.

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Materials and Methods

Patients

The authors performed cosmetic ptosis correction in 121 patients (105 males and 16 females) between April 2013 and December 2017, and all patients were enrolled in this retrospective study. Patients underwent surgical procedures at the author's respective institutions. The inclusion criteria consisted of mild-to-moderate degrees of ptosis (less than 3 mm) and levator function greater than 5 mm, ages greater than 16 years, and no prior ptosis surgery. The postoperative follow-up period ranged from 3 months to 3 years. The average patient age was 24.7 years (range 16–64 years). The study protocol was approved by the Institutional Review Board of our institution (Approval No.: KUGH 15091-001) and was performed in accordance with the Declaration of Helsinki. For this retrospective study, formal consent was not required.

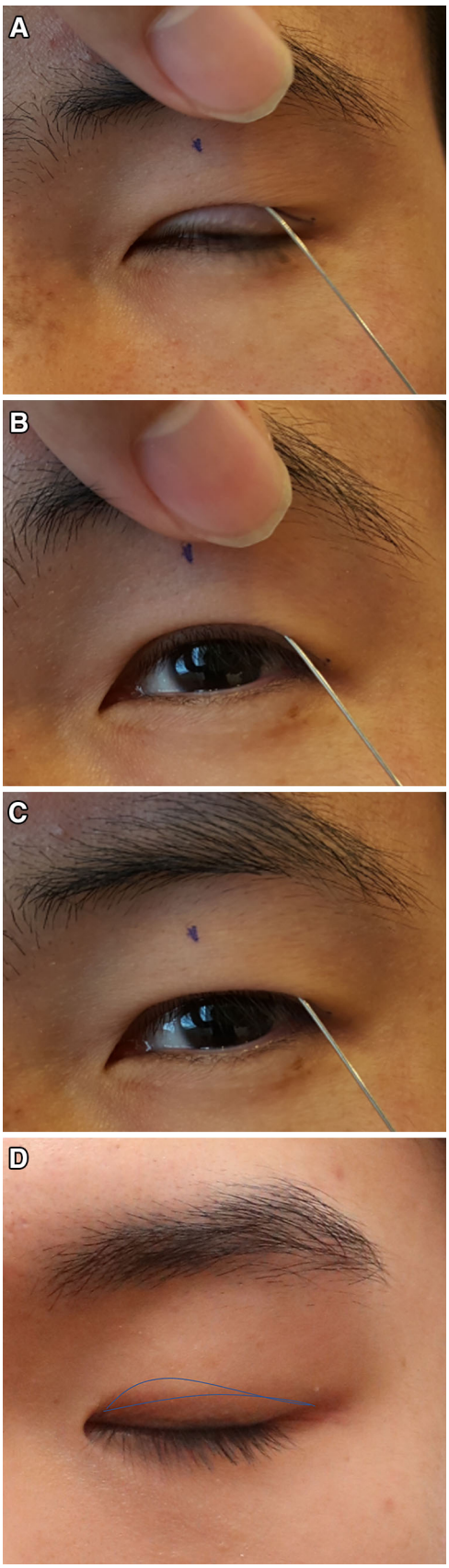
Preoperative Evaluation

To assess the severity of ptosis, the marginal reflex distance test 1 (MRD1) and the degree of levator function were measured. The upper eyelid skin was demarcated using a bougie to determine the extent of ptosis correction necessary, and the skin resection volume was analyzed in an upright sitting position [3, 4]. After determining the amount of remnant skin to be excised, 3 mm of advancement was planned for every 1 mm of ptosis [5].

To verify the degree of sagging of the skin, lifting the eyebrows slightly, it made that the double eyelids using a bougie were almost invisible. Releasing the eyebrows allowed the measurement of the excessive amount of eyelid skin (see video, Supplemental Digital Content 1, which shows the preoperative marking of the patient). When skin excision was required, the medial-sided skin was excised at the supratarsal crease level (Fig. 1).

To assess skin thickness, a double eyelid line was designed using a bougie. When the eyelid could be kept for more than 2 s, the skin was judged to be thin. If the eyelid disappeared within 2 s, the skin was judged to be thick.

To determine the degree of proptosis, a vector analysis and a Hertel exophthalmometer were used [6]. If the exophthalmometer measurement was larger than 18 mm and indicated a negative vector, an assessment of a protruding eyeball was made.



◀**Fig. 1** Preoperative evaluation using a bougie. **a** Lower flap height. **b** Lifting the eyebrows slightly. **c** Releasing the eyebrows. **d** The design of skin excision

Surgical Technique

All surgical procedures were performed under local anesthesia with 2% lidocaine and 1:100,000 epinephrine. The design of the lower flap was the same as that of a traditional upper blepharoplasty. The height of the lower flap was about 4–7 mm, and 2-mm skin excision was required for every 1-mm ptosis correction. However, every 1-mm increase in the height of the lower flap did not require excision of more than 1.5–2-mm skin. The skin excision amount would depend on the skin thickness. Thick skin should be excised less, and thin skin should be excised more. When the ptosis correction amount is increased by 1 mm, the lateral lower flap is raised higher and the possibility of showing double eyelids increases, provided that the height of the lower flap is not more than 7 mm; then, the medial and central skin should be excised. After incision and excision of the skin and underlying orbicularis muscle in the designed area, the orbital septum was opened. If there was no specific reason to remove the orbicularis muscle, we performed a minimal excision of the orbicularis muscle after skin incision. Preserving the orbicularis muscle as much as possible on the skin incision site was beneficial to maintaining a natural-looking appearance. Then, ptosis correction using the under-through technique was performed [5]. The height and contour of the eyelid were tested in the upright sitting and supine positions. Usually, 3 sutures were placed: centrally, medially, and laterally. If the eyelid height, contour, or symmetry were unsatisfactory after plication according to the amount planned preoperatively, the ties were untied and an adjustment was made by repositioning the fixation site in the levator complex, while maintaining the original fixation through the tarsus (see video, Supplemental Digital Content 2, which shows the plication using under-through technique). Fixation of the new double fold followed. The dermis muscle of the inferior skin edge was anchored to the tarsus and the advanced levator complex using a 6-0 nylon suture. The skin was closed with a continuous or interrupted 7-0 silk suture. To prevent trichiasis, it is necessary to anchor the lower flap, tarsus, and levator complex, so that the eyelash becomes everted. In particular, if the orbicularis muscle of the outer fascia in the lower flap and levator complex is anchored, an eyelash eversion can be achieved effectively (see video, Supplemental Digital Content 3, which shows the fixation of double fold and the prevention of trichiasis).

Postoperative Course

All patients returned on the sixth or seventh postoperative day for suture removal and assessment of the eyelid height, contour, and symmetry. A successful outcome was defined as an eyelid level within 1 mm of the desired height or within a 0.5 mm difference between the eyelids. The patients' satisfaction with the procedure and complications was also analyzed.

Results

A successful outcome was achieved with this original surgical technique in 113 (93.4%) patients (Figs. 2, 3, 4). All eight unsuccessful procedures occurred in male patients, and skin sagging remained in five patients, which required skin excision. Three patients had asymmetry and were subsequently corrected.

Although we did not assess the patients' satisfaction using a formal score or questionnaire, almost all patients (n = 112 [92.6%]) expressed satisfaction with the results during their follow-up evaluation. Patients were particularly satisfied with the natural-looking appearance and the hidden incisional scar. The results of successful outcome and patients' satisfaction were almost identical. For only one patient, the successful outcome did not correspond to patient satisfaction; the patient was female and had hoped to increase the vertical palpebral fissure height even more.

Complications potentially associated with ptosis surgery, such as conjunctival prolapse, exposure keratitis, or corneal abrasion, were not observed.

Patients: Representative Case Reports

Patient 1

A 32-year-old male presented with small eyes and eyelid asymmetry. The epicanthoplasty was performed, and the lower flap of the double eyelids was about 5 mm and required incisional ptosis surgery. The right-sided ptosis correction was 1.5 mm and the left side 2 mm. The surgical method used was the under-through technique. Excision of the skin was not required for the right eye, whereas on the left side, the skin was resected on the medial side by about 2 mm. The left eye achieved a better ptosis correction because the left eye presented more sagging skin due to facial asymmetry (Fig. 2).

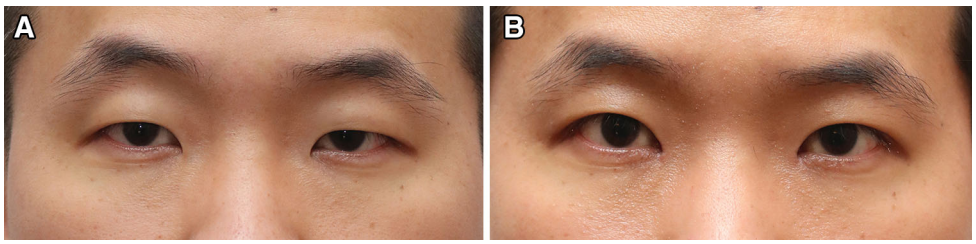


Fig. 2 Patient 1. A 32-year-old male who underwent bilateral incisional ptosis surgery. The right-sided ptosis correction was 1.5 mm, and the correction on the left side was of 2 mm. For the right eye, the skin was not excised, whereas on the left side, the skin was excised on the medial side by approximately 2 mm. **a** Preoperative view. **b** Postoperative 1-month view

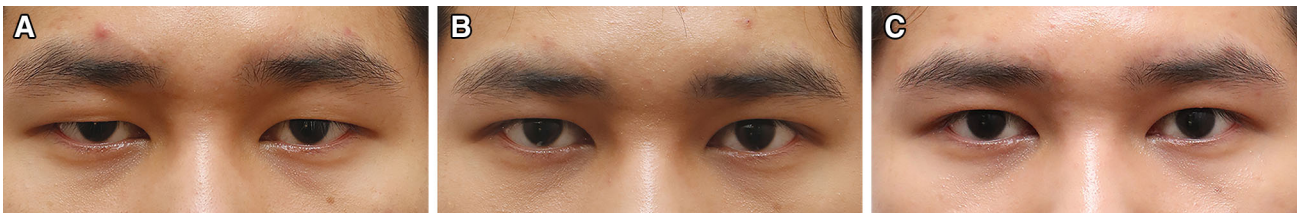


Fig. 3 Patient 2. A 20-year-old male who underwent bilateral incisional ptosis surgery. Both ptosis corrections were of 2 mm, and the skin was resected by about 2 mm. Because the right side of the skin sagged 6 months after the original surgery, an additional 2 mm of skin was resected. **a** Preoperative view. **b** Postoperative 6-month view. **c** Post-revision 6-month view

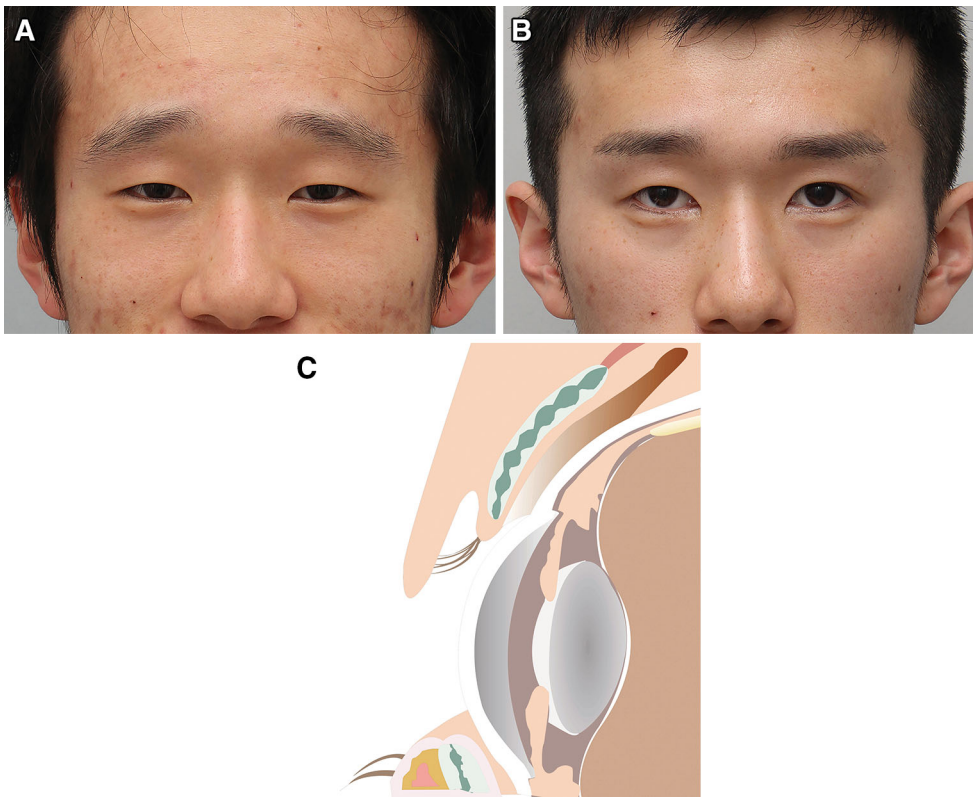


Fig. 4 Patient 4. A 23-year-old male who underwent bilateral incisional ptosis surgery on both sides. Both ptosis corrections were of 2 mm, and the skin was not resected. **a** Preoperative view. **b** Postoperative 6-month view. **c** A representative diagram of the pseudoptosis observed due to skin sagging

Patient 2

A 20-year-old male presented with small eyes and eyelid asymmetry. Both eyelids underwent 2-mm ptosis correction using the under-through technique. The lower flap of the double eyelids was 5 mm on both sides, and 2 mm of skin was resected. Because the right side of the skin showed some sagging 6 months after the operation, a further 2 mm of skin was resected (Fig. 3).

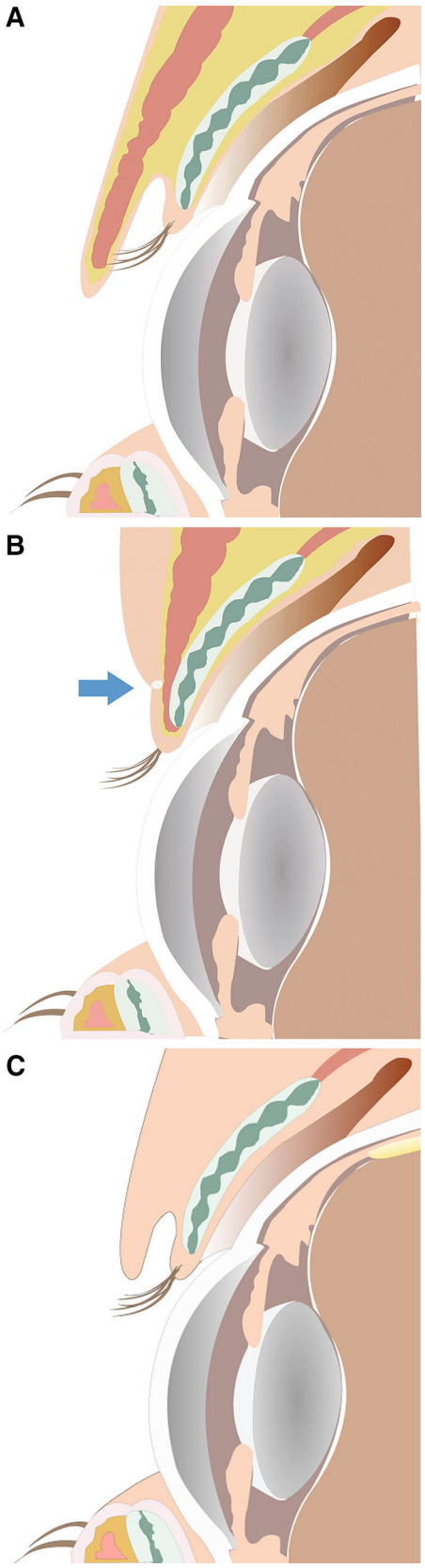


Fig. 5 Representations of **a** pseudoptosis due to residual skin hooding and **b** the visible scar, whereby the scar is not hidden when the eye is open. **c** Incisional ptosis correction with hidden double fold

Patient 3

A 23-year-old male presented with small eyes. Both eyelids underwent 2-mm ptosis correction using the under-through technique, and the skin was not resected. The lower flap of the double eyelids was 5 mm on both sides. The right side of the skin showed signs of sagging, and the right fold was lost 6 months after the operation. Thus, despite the ptosis correction, pseudoptosis was observed in which the eyes were small due to skin sagging (Fig. 4).

Discussion

In correcting ptosis without formation of double eyelids, the vertical height of the palpebral fissure may not be increased due to remnant skin hooding despite the corrective ptosis (Fig. 5a). In such cases, scar tissue might be observed if remnant skin hooding was removed, irrespective of creating the double eyelid to ultimately improve skin hooding. Some patients have asked to have the double-folded line removed after eyelid surgery. If there is no double fold in the upper eyelid where the double eyelid should be, the scar cannot be hidden when the eyes are opened (Fig. 5b). Moreover, the eyelid tissue at the incisional scar site becomes hypertrophied due to the scar tissue [7]. To resolve this issue, it is possible to form a lower double-folded line to reduce skin hooding and to hide the incisional scar.

This report describes a refined method of preoperative evaluation for incisional eyelid ptosis correction with a concealed double fold. For ptosis correction with the aim of hiding the visible double-folded line, surgeons should allow for a slight residual skin hooding, so that the double eyelids remain invisible (Fig. 5c). However, when skin sagging is excessive, the effect of ptosis correction is reduced. Therefore, if a sufficient amount of skin hooding is removed, the scar may be hidden and the eyes could appear enlarged. The key highlight of this technique is to determine the amount of skin excision and the lower flap height at preoperative evaluation. These measurements should be taken in the upright sitting position.

The height of the lower flap usually ranged from 4 to 7 mm. The factors that determine the lower flap height were the protrusion of the eyeballs and the levator function [8]. Patients with protruding eyeballs or a weak levator function should have a lower flap height close to 4 mm, whereas patients with good levator function or without protruding eyeballs will require a lower flap height of approximately 7 mm. In protruding eyeballs, the double eyelids may not be hidden when the lower flap height of

double eyelids is not lower because patients with protruding eyeballs have more skin hooding than patients with depressed eyeballs. Patients with good levator function might need to have the lower flap height raised because the more ptosis is corrected, the greater the sagging of the upper eyelid skin.

If it was necessary to excise the hooding skin by less than 2 mm, it would be better to excise only the excess skin, rather than manipulating the lower flap height of the double fold. However, if it is necessary to excise more than 3 mm of skin, it is recommended that the lower flap height of the double fold be raised, rather than resecting an excessive amount of eyelid skin. If a substantial amount of thin skin is excised, the result will be appeared awkward and give the impression of being over-operated. In addition, when the fold loosens, the skin will sag and the overall effect of the ptosis correction will decrease. Surgeons should pay special attention to preventing the loosening the double eyelids.

In our study, there were a total of eight unsuccessful outcomes and all were male. The reasons for unsuccessful outcomes in all male patients are still unclear. Because male patients accounted for 86% of the total patient population, further research is needed to determine the effect of sex on this surgical method. There were no significant differences in the surgical approach between male and female patients although in women, the lower flap of the double eyelid could be raised higher and the skin was not resected because the eyelid was easier to expose at a later time due to subjective satisfaction.

Conclusion

Incisional ptosis correction with a hidden double fold is a technique that uses simple methods and focuses on concealing a double fold. This technique improves periorbital contouring, makes the eyes brighter without showing double-fold eyelids, and provides excellent esthetic results. Ptosis correction without formation of a double eyelid will result in skin hooding and a visible scar; thus, it is suggested to lower the height of the double eyelids. The lower height of the double eyelids can cover the incisional scar and make it appear like there are no double eyelids.

Compliance with Ethical Standards

Conflict of interest The authors have no conflicts of interest to disclose.

Ethical Approval The study protocol was approved by the institutional review board (IRB) of our institution (Approval No.: KUGH 15091-001). This study was performed in accordance with the Declaration of Helsinki.

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