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Aesthetic Plastic Surgery

Cosmetic Lateral Canthoplasty

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Abstract.
Background: Although there are patients who want cosmetic lateral canthoplasty to lengthen the lateral palpebral fissure of the lateral canthal area, no recommendable operational procedure exists that results in an accepatable scar formation. Because of the round eyeball shape, lengthening and widening of the lateral palpebral fissure should not be in the lateral direction, but rather in the posterior direction to keep the surface between the bulbar conjunctiva and the palpebral conjunctiva in contact.
Methods: The authors believed that using an upper crus flap of the upper eyelid margin as a transposition flap would enable lengthening of the lower eyelid width and posterior deepening of the lateral canthal area. This was thought possible by transverse back-cutting of the palpebral conjunctiva on the lateral fornix area.
Results: The authors have performed cosmetic lateral canthoplasty in more than 200 cases to increase the width of the lateral palpebral fissure. All the results were satisfactory and aesthetically acceptable.
Conclusions: The reported surgery makes the eyes appear larger and brighter. The authors think this procedure is a good and convenient method although it is not perfect.

Key words: Eyelids—Canthoplasty

No effective technique has achieved lateral canthoplasty for oriental patients who want to lengthen short palpebral fissures so that the eyes appear bigger and brighter. A simple direct opening of the lateral canthus can open the eyes, leaving a natural appearance. We exploited a very lateral end segment, a crus flap, of the upper eyelid, adding to the lower eyelid at the lateral canthal angle so as to widen the lateral canthus. We applied this technique in 202 cases with satisfactory results.

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Materials and Methods

Patients

We performed cosmetic lateral canthoplasty in 202 cases from January, 2000 to December, 2002. The. average patient age was 23.7 years (range, 15–64 years). The postoperative follow-up period ranged from 1 month to 3 years. Indications for cosmetic lateral canthoplasty are as follows more than 4 mm from the lateral orbit rim to the lateral canthal angle in an anteroposterior distance of exophthalmometry, more than 3 mm of lateral fornix depth, shorter distance from the midpupil to the lateral canthal angle than to the epicanthus.

In most of the cases, epicanthoplasty, upper and lower blepharoplasty, and correction of the ectropion of the lower eyelid were performed at the same time.

Surgical Technique

The procedures were performed with the patient under local anesthesia. An elevated upper eyelid crus flap was used for the lateral part of the lower eyelid, acting as a rotation flap. The base of this flap contains the upper eyelid margin and the palpebral conjunctiva without the upper eyelashes. The tip of the flap contains the lid skin only. The upper crus flap was 2 to 3 mm in length, and the posterior deepening of the palpebral conjunctiva was performed by

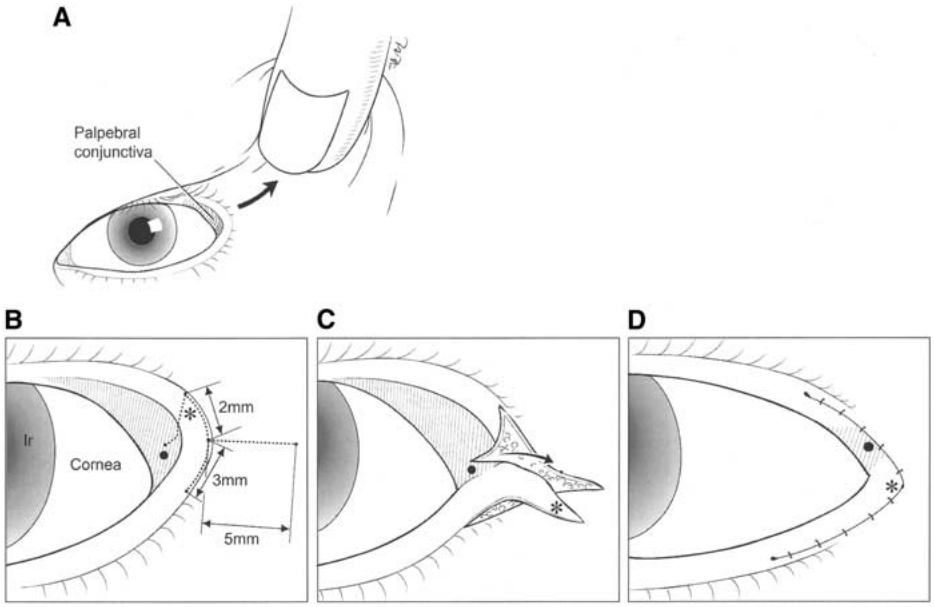

Fig. 1. Surgical technique of Shin's cosmetic lateral canthoplasty. **(A)** Upper: Eyelid skin is retracted laterally. **(B)** Lower left: Design of the upper eyelid crus flap. The proximal part of the flap contains the upper eyelid margin and the palpebral mucosa without eyelashes. The tip of the flap (*) contains the upper eyelid skin only. The upper crus flap is 2 to 3 mm in length, and the posterior deepening of the palpebral conjunctiva is performed by transverse back cut (●) **(C)** Lower middle: The upper crus flap is transposed. The tip of the flap is transposed to the new lateral canthus. The defect caused by the upper crus flap is covered by a direct suture method between the palpebral conjunctiva and the skin. **(D)** Lower right: Ending point of the transverse back cut (●) is transposed to the upper lid margin.

transverse back-cutting after bleeding control by coagulation of the palpebral conjunctiva and soft tissue. The deepening depth was less than half the transverse length of the palpebral conjunctiva. This reduced the tension between the palpebral conjunctiva and skin after primary closure. The width of the flap was determined according to the shape of the canthal angle because the width of the base should not exceed 3 mm to avoid a notching deformity of the upper eyelid or tarsal sling injury. It is important to cut and widen the orbicularis muscle in the lateral raphe area for the rotational upper crus flap to be in its new position. Through this procedure, elevated dog-ear deformity can be avoided. We were able to get a posterior deepening effect of the lateral canthal angle without anterior relapse of the lateral canthal angle. The defect caused by the upper crus flap was covered by a direct suture between the palpebral conjunctiva and the skin with a 6-0 vicryl suture to avoid irritation of the sclera. The skin was sutured with 7-0 nylon under a × 2.5 loupe field (Figs. 1 and 2).

Measurements

The preoperative and postoperative lengths of the eye fissure were measured. The length of the eye fissure was the distance between the endocanthion and the exocanthion of each eye.

Results

The postoperative follow-up period ranged from 1 month to 3 years for 36 patients.

The length of the eye fissure increased by 3.1 mm on the average, ranging from 2.2 to 7.5 mm. Two cases showed hypertrophic scars in the opened lateral canthus. The scars responded well to topical application of a steroid ointment in 6 months (Figs. 3 and 4).

Discussion

Reconstructive canthoplasty has evolved to a cosmetic procedure of the canthal area. We developed a technique to lengthen the lateral orbital fissure, maintaining the natural configuration of the lateral canthal angle. A certain number of oriental slim eyes need double - folded blepharoplasty as well as either epicanthoplasty or lateral canthoplasty to lengthen the orbital fissure. This surgery makes the eyes appear larger and brighter.

Several procedures of lateral canthoplasty were previously introduced [1, 2, 3, 4]. However, there were limitations in the cosmetic operation because of scarring and disruption in the continuity of the lower lid and destruction of the natural shape in the lateral canthal angle area (Fig. 5). The principles and guidelines for performing cosmetic lateral canthoplasty to lengthen the orbital fissure are as follows.

Fig. 2. Intraoperative photograph of lateral canthoplasty (Right eye). Upper crus flap (lower forcep) is elevated.

1. The continuity of the lower eyelid margin should be preserved. The Von Ammon [4] and Blair [2]method disrupts the continuity of the lower lid margin.
2. The contact surface should be kept fittingly between the bulbar conjunctiva and the palpebral conjunctiva. The reduced depths of the lateral fornix caused by posterior deepening should be maintained. This is essential for lateral widening of the palpebral fissure. There is not yet a good method for posterior deepening.
3. The eyelashes should be saved. The crus flap of the upper eyelid does not contain eyelashes.
4. The crus flap of the upper eyelid should not be tense.
5. The length of the crus flap should be less than 5 mm to hide the scar in the dark skin area of the lateral orbital rim.
6. The length of the crus flap should be matched to the intended length of the increased fissure of the lateral canthus.
7. The patient's orbital condition should be more than 4 mm from the orbital rim to the lateral canthal angle in exophthalmometry[2]. The lateral fornix depth should be more than 3 mm to get an effect of posterior deepening and lengthening of the lateral palpebral fissure.

To keep the upper lid margin natural without notching deformity after cosmetic lateral canthoplasty, the shape of the crus flap should be in the shape of a triangle shaped. Without cutting the palpebral conjunctiva in the lateral fornix area, we could not attain posterior deepening of lateral pal-

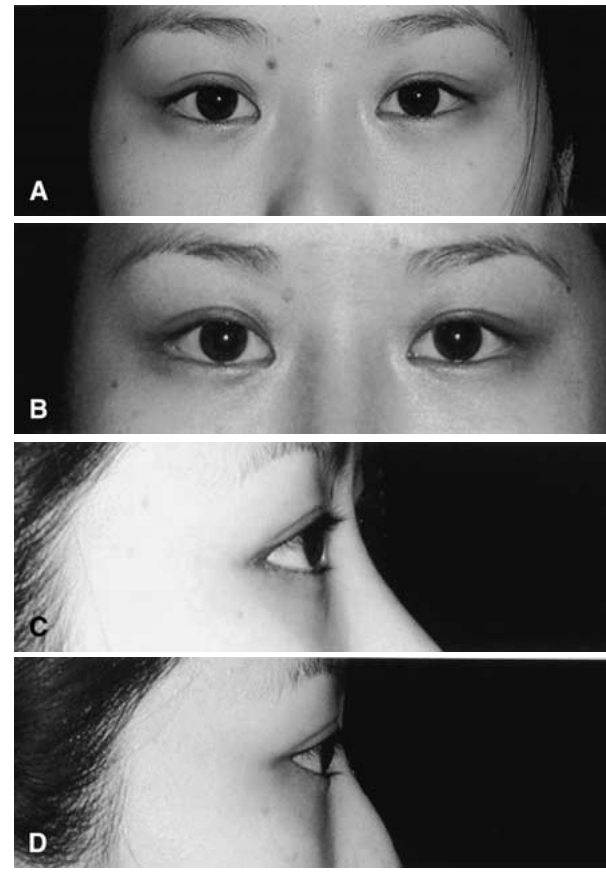

Fig. 3. Photographs of a 29-year-old patient who underwent lateral canthoplasty. **(A)** Above left: Preoperative frontal view. **(B)** Above right: Postoperative frontal view after 1 year. **(C)** Below left: Preoperative lateral view. **(D)** Below right: Postoperative view after 1 year.

Fig. 4. Photographs of a 22-year-old patient who underwent epicanthoplasty and lateral canthoplasty. **(A)** Left: Preoperative frontal view. **(B)** Right: Postoperative frontal view after 7 months.

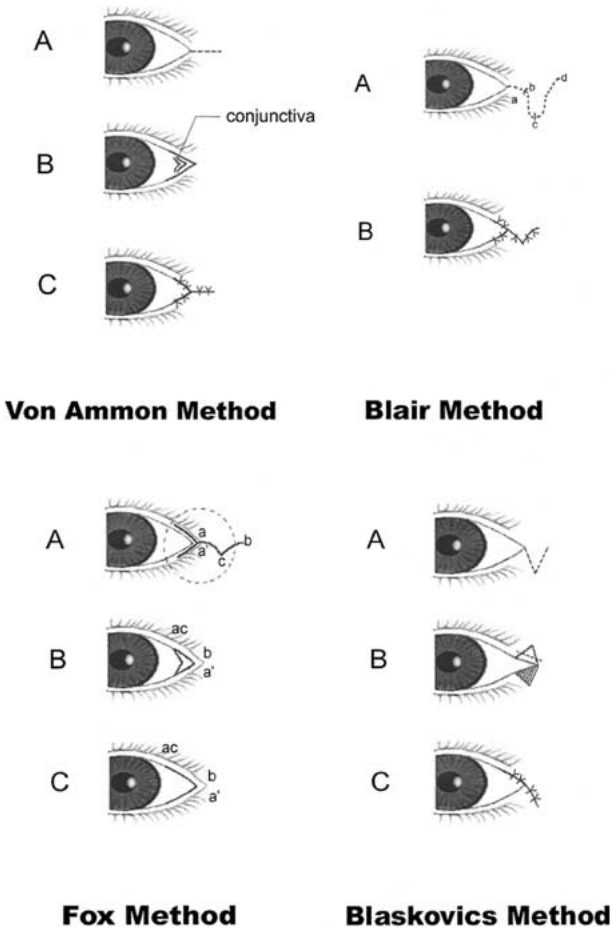

Fig. 5. The techniques mentioned in the literature for lateral canthoplasty.

pebral fissure. Therefore, a back cut was made at the palpebral conjunctiva of the lateral fornix to get a longer crus flap as well as a wide and increased palpebral fissure. Fortunately the directions of the upper eyelashes were laterally directed, and the stitch marks were hidden in the invisible area of the upper lateral lid margin. Because the tension can cause hypertropic scarring, a tension-free suture is important. Adjustment of the axis of the upper eyelid crus flap can change the image of the patients, although its difference is not so prominent. The patient should be carefully selected for this procedure because the possible amount of posterior deepening is limited.

This technique is less effective for patients who have a shallow lateral fornix. For the patient who has less than 4 mm distance from the orbital rim to the lateral canthal angle and less than 3 mm of lateral fornix depth, this technique should be avoided because posterior deepening cannot be sufficiently performed. For congenital phimosis or enopthalmos, this technique is not indicated.

Preoperative exophthalmometry checking is essential for predicting the amount of lateral palpebral fissure widening and deepening. We think this procedure is a good and convenient method although it is not perfect. We hope the current modifications and improvements of the reported technique will be followed by continued efforts by other plastic surgeons to perfect this method.

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