Objective: To describe extended infrabrow excision blepharoplasty (IBEB), whereby skin excision is extended to a substantial part of intrabrow skin and the intrabrow incision is made perpendicular to the hair shaft.

Methods: A total of 194 Asian patients with moderate to severe dermatochalasis underwent extended IBEB. The mean width of excised skin at its widest was 12.8 mm (range, 6-22 mm).

Results: Extended IBEB significantly reduced eyelid laxity but produced a natural-looking eyelid because it did not damage the eyelid framework. With application of eyebrow makeup by women, routine social activity was resumed soon after surgery. Infrabrow scarring became inconspicuous in patients with thick eyebrows after regrowth.

Conclusions: Extended IBEB is recommended for middle-aged and older Asian women with moderate to severe dermatochalasis. With precise incision and fine suturing, regrowth alleviates eyebrow reduction and scarring among Asians who do not use makeup (male patients and young female patients).

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METHODS

PREOPERATIVE PLANNING AND MARKING

The tear-shaped skin pad to be excised in the infrabrow and intrabrow is marked off with the patient in the supine position (Figure 1). The medial point of the skin pad is marked at least 5 mm laterally inward from the head of the eyebrow, and the lateral point ends 5 to 10 mm laterally outward from the tail of the eyebrow. The upper margin of the skin pad is usually above the margin of the brow all along its length. The skin pad includes a substantial amount of the lateral portion and some of the medial portion of the brow. Consequently, the skin pad at its vertical maximal width is at least 10 to 20 mm but slightly more in most patients. Unless the patient desires subtle changes, a width exceeding 10 mm is needed depending on the degree of redundancy in the eyelid and the forehead and based on the amount of eyebrow reduction acceptable to the patient. However, it is strongly recommended that at least a 25-mm vertical width of eyelid skin should be preserved all along its length. The skin pad includes a substantial amount of the lateral portion and some of the medial portion of the brow. Consequently, the skin pad at its vertical maximal width is at least 10 to 20 mm but is slightly more in most patients. Unless the patient desires subtle changes, a width exceeding 10 mm is needed depending on the degree of redundancy in the eyelid and the forehead and based on the amount of eyebrow reduction acceptable to the patient. However, it is strongly recommended that at least a 25-mm vertical width of eyelid skin should be preserved all along the eyelid to avoid excessive resection and to maintain eyelid and eyebrow proportions. These criteria are for Japanese patients with a standard-size face; for others, the dimensions of eyelid skin to be preserved vary according to face size and race/ethnicity. Marking is started after deciding the lower limits of the skin pad. When redundancy of the forehead is apparent, adjunctive procedures (such as browpexy, brow-lift, or resection of the depressor muscles of the eyebrow) are considered to counter postoperative descent of the eyebrow. The width of the skin pad to be excised can be reduced when browpexy or brow-lift is needed.

OPERATIVE TECHNIQUE

Surgery is usually performed using local anesthesia. A solution of 2% lidocaine hydrochloride with 1:100,000 epinephrine (adrenaline) is injected via a 30-gauge needle in the subcutis of and around the tear-shaped skin pad to be excised. A superficial incision (3-mm deep) is made in the upper edge of the skin pad, usually in the intrabrow, using a No. 11 or 15 blade at an angle of 30° to the skin surface so that sufficient numbers of follicles are preserved in the dermis (Figure 2). The excision is then continued into the subcutaneous fat by changing the angle of the blade to 90° to the skin surface. Another incision is made in the lower margin of the skin pad at the same angle as that in the upper margin. The skin pad is excised from the layer above the orbicularis oculi. The subseptal fat, nasal fat, and retroorbicularis oculi fat are easily resected if necessary. Hemostasis is confirmed before wound closure. The orbicularis oculi is then tacked. The orbicularis oculi near the lower skin incision is pulled 45° upward and inward and sutured to the orbicularis oculi near the upper skin incision using two 5-0 polydioxanone sutures. The lower skin flap is rotated several millimeters medially, and the redundant skin on the medial side of the flap is used to reduce undesirable formation of the groove and fold running obliquely from the medial portion of the eyebrow to the medial canthus. This formation often occurs in patients undergoing wide skin excision or browpexy. Several stitches of dermal suture are made using 5-0 polydioxanone suture. The skin is closed using 6-0 or 7-0 black nylon so that the edges of both wound margins match precisely.

PATIENTS

Medical records were reviewed of 194 Asian patients (388 eyelids) with moderate to severe bilateral dermatochalasis who had undergone extended IBEB between January 1, 2007, and December 31, 2009. The series comprised 160 women and 34 men (mean age, 61.5 years; age range, 20-85 years). At its widest,
the mean width of the skin pad to be excised was 12.8 mm (range, 6-22 mm). Also performed were resection of the corrugator muscle in 144 eyelids and internal browpexy in 80 eyelids. The mean follow-up period ranged from 3 to 24 months. All surgical procedures were performed by one of us (A.I.).

RESULTS

Extended IBEB was effective in reducing eyelid redundancy among Asian patients with moderate to severe dermatochalasis, without major complications. Postoperative scarring was acceptable, as no patient required subsequent corrective surgery. Although some patients initially experienced slight redness, this became less conspicuous after 1 month for most patients and within 3 months for the remainder. Routine social activity was resumed approximately 1 week after surgery with the use of eyebrow makeup or glasses. Furthermore, regrowth of the eyebrow through the scar was observed in all patients with thick eyebrows, covering the incision location and disguising it a few weeks after surgery. Extended IBEB mini-

mized eyebrow reduction, with no unfavorable results even among male patients. Patients expressed a high degree of overall satisfaction and improved visual function, including enlargement of the visual field and ease in opening the eye. Transient numbness that developed in areas of the lateral and upper orbit in some patients improved gradually and was followed by sensations like tingling or itching. These sensations gradually disappeared approximately 1 month after surgery for most patients but took 3 months in 3 patients who had undergone extended IBEB with browpexy and resection of the corrugator muscle.

Exemplary cases in 2 Asian patients are shown in Figure 3 and Figure 4. Extended IBEB was performed in both.

COMMENT

Extended IBEB reduces redundancy of the eyelid in Asian patients with dermatochalasis, without a long recovery time. It preserves original features of the eyelid, espe-

Figure 3. A 41-year-old woman who underwent extended infrabrow excision blepharoplasty. A, Dermatochalasis with thick eyelid. B, Extended infrabrow excision blepharoplasty was performed, with the intrabrow skin incision made perpendicular to the hair shaft, where the maximal width of the skin pad was 13 mm. Subseptal fat, nasal fat, and corrugator muscle were dissected. C, One month after the operation, the scar was slightly reddish and was partially covered by the regrown eyebrow. The patient did not apply makeup to the eyebrow after surgery. D, Six months after the operation, a natural and rejuvenated eyelid was achieved. The regrown eyebrow entirely covered the scar and made it inconspicuous. The eyebrow thickened, and eyebrow reduction was acceptable without makeup.
cially the crease, resulting in a natural-looking and rejuvenated eyelid. Early resumption of social activity is assured after removal of the sutures; postoperative swelling of the eyelid is rarely long, and the scar is easily covered up with makeup. Regrowth of the eyebrow from follicles preserved around the scar disguises the incision location and alleviates eyebrow reduction. The patient experiences no associated social stigma, with barely detectable traces of facial rejuvenation surgery. Many patients demonstrate greater ease in opening the eye and enlargement of the upper visual field. Most patients express an overall high level of satisfaction.

A drawback to conventional IBEB in some patients is insufficient reduction in redundancy of the upper eyelid. Postoperative descent of the eyebrow may occur to a greater or lesser degree because of frontal muscle relaxation. In these patients, only subtle improvement of dermatochalasis may be demonstrated after conventional IBEB. Removal of an excessive amount of infrabrow skin is not a desirable option because it spoils upper eyelid and eyebrow proportions. After surgery, most patients change the position of the eyebrow by plucking its lower part and applying makeup. Without makeup, the surgical scar at the lower margin of the eyebrow is exposed and may become conspicuous. To counter this, the option presented herein is to extend the amount of skin to be excised to a substantial part of infrabrow skin and to avoid removal of an excessive amount of infrabrow skin. Other modalities to prevent unfavorable postoperative descent of the eyebrow are the use of internal browpexy, 6,7 and medial brow-lift. We rarely perform supraborbrow skin excision brow-lift because the supraborbrow scar becomes hypertrophic and conspicuous, especially in young or middle-aged patients (Figure 5), although it could be effective in those experiencing dermatochalasis and brow ptosis.

Scarring after extended IBEB becomes inconspicuous, without hypertrophic changes. However, precise incisions and fine suturing techniques are mandatory. Our series demonstrated that incision of infrabrow skin perpendicular to the hair shaft allows hair regrowth through the scar, similar to hairline incisions in facelift procedures. 5 To our knowledge, the present study is the first documentation of this method. The technique disguises the scar at the lower margin of the eyebrow and alleviates eyebrow reduction. Careful maneuvering of the blade during incision of infrabrow skin is critical because follicles of the eyebrow are located more superficially than those of the hairline. Sutures at the edges of both wound margins must be precisely matched to render the scar inconspicuous soon after surgery. A thick eyebrow results in good regrowth of hair, but a thin eyebrow rarely does so. Nonetheless, even in patients with thin eyebrows, the technique avoids damage to hair follicles at the incision line.

In some patients who undergo extended IBEB, transient numbness develops in areas of the lateral upper orbit, followed by tingling or itching; this occurs in other patients after browpexy 6,7 or resection of the corrugator muscle 8 or retroorbicularis oculi fat. 9 Abnormal sensations usually begin a few weeks after surgery but can occur as early as a few days following the procedure and gradually disappear within a few months. Careful preservation of supraorbital and supratrochlear nerve branches reduces the development of these sensations. The surgeon should inform the patient that irritations are a good sign, indicating restoration of normal sensations.

Extended IBEB is a good option for middle-aged and older Asian women with moderate to severe dermatochalasis; however, it can also be used in male and young female Asians. This modality can meet the expectations of

Figure 4. A 71-year-old man who underwent extended infrabrow excision blepharoplasty. A, He reported difficulty in opening his eye and a narrow upper visual field owing to significant bilateral dermatochalasis. B, Extended infrabrow excision blepharoplasty was performed, in which the maximal width of the removed skin pad was 20 mm. C, Six months after the operation, eyelid redundancy was alleviated, and the patient was able to easily open the eye. The regrown eyebrow covered the scar and made it inconspicuous. Eyebrow reduction was acceptable.

Figure 5. Scar after supraborbrow excision brow-lift. The scar becomes conspicuous in some patients after supraborbrow excision brow-lift, as seen in this 71-year-old man 3 months after surgery.
patients with aesthetic concerns if the aim is simple reduction in eyelid redundancy. In fact, many patients request blepharoplasty to achieve natural rejuvenation without creation of a new double eyelid. Previously, the preferred procedure by our group was standard blepharoplasty, which created a new double eyelid,9 and we assumed that IBEB would be used in few patients because they would be unwilling to accept an infrabrow scar or eyebrow reduction. However, this proved to be unfounded, with the method benefiting many patients. Furthermore, extended IBEB decreases risk for failure in aesthetics and function. For most patients, we now recommend extended IBEB as a first choice, unless the patient rejects infrabrow scarring or eyebrow reduction.

In conclusion, extended IBEB extends the amount of skin to be excised to include a portion of intrabrow skin. This simple procedure provides significant reduction in eyelid redundancy among Asian patients with dermatochalasis, but some drawbacks need to be countered by well-designed precise incisions and fine suturing techniques or by adjunctive procedures when needed, such as internal browpexy or resection of the corrugator muscle. In our practice, it is performed in Asians but not in patients of white race/ethnicity because we lack experience. Nevertheless, we anticipate future application of this method to selected patients of white race/ethnicity, as the original description of IBEB4 was based on this patient population.

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Additional Contributions: Ryosuke Fujimori, MD, and colleagues publicized the effectiveness of conventional IBEB among Japanese patients with dermatochalasis.

REFERENCES