

## Measurement Method of Upper Blepharoplasty for Orientals

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**Abstract.** There is a considerable anatomical difference in the upper eyelid and the surrounding tissue of Orientals and Westerners. This results in a difference in the general public's opinion about "aged eyes." Accordingly, when upper blepharoplasty is performed on Orientals for rejuvenation, the anatomical difference and the differing public viewpoint must be taken into account in order to achieve successful results that satisfy patients. The author discusses the differences between two grooves—the orbitopalpebral groove (OPG) and the superior-palpebral groove (SPG)—and the upper eyelid to distinguish the position and shape in Orientals versus Westerners. From his experience, the author shows that the OPG and the SPG might be formed from completely different mechanisms. The SPG of the double eyelid of Orientals is located closer to the palpebral rim than that of Westerners, making it easily distinguishable from the OPG. Thus, it is necessary to specify preoperatively the height of the fold and the shape of the double eyelid that the patient desires when performing a rejuvenating upper blepharoplasty. One must predetermine the resulting height of the SPG as well as the amount of excised skin to obtain a desirable double eyelid. So far, the amount of excised skin has been determined by the surgeon based on his experience. The author has devised an easy and accurate method to use to preoperatively determine the amount of skin to be excised.

**Key words:** Orbitopalpebral groove—Superior-palpebral groove—Blepharoplasty

The Oriental greatly differs from Westerners in regard to the soft tissues on the eyelids and the structure of the superorbital bones surrounding the eyelids. The general public's opinions of "aged eyes" of the two races, based on the anatomical differ-

ences, also differ. Therefore, when performing a rejuvenating blepharoplasty of the upper eyelid of Orientals, it is difficult to achieve satisfactory results unless the surgeon understands the anatomical characteristics and is aware of the public's view of aged eyes of Orientals.

### Anatomical Characteristics

#### *Distance of the Upper Eyelid*

The upper eyelid—the area from the eyebrow to the edge of the eyelid—is divided into two areas: the orbital area and the tarsal area, in each of which are the orbitopalpebral groove and the superior-palpebral groove. The Oriental upper eyelid is longer than that of Westerners (Figs. 1A–D).

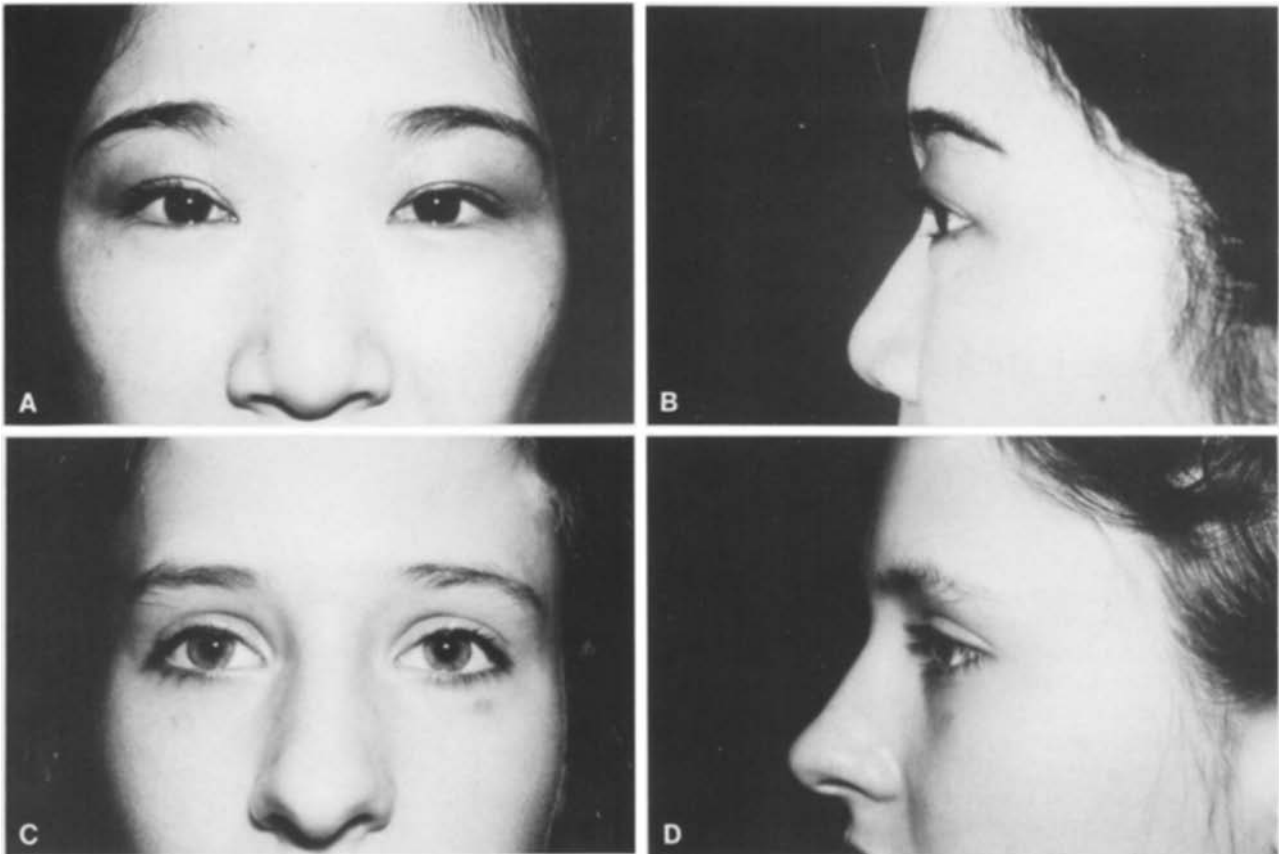
#### *Orbital Area*

Westerners have protruding supraorbital bones and a small amount of fat in the central connective tissue (retroauricular muscle area) and the supraorbital cavity of the upper eyelid so the orbitopalpebral groove is depressed and clear. On the other hand, Orientals generally have low supraorbital bones and sufficient fat not only in the supraorbital cavity but also in the central connective tissue area so that the orbitopalpebral groove is flat and not clearly defined [1, 2, 5, 6].

#### *Tarsal Area*

The superior-palpebral groove in the tarsal area normally is situated so that it creates a double eyelid. In Westerners, this groove is positioned high and is often seen with the orbitopalpebral groove. In

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**Fig. 1(A,B)** Typical upper eyelids for a young Japanese woman. Note shallower orbitopalpebral folds and superior-palpebral fold at the lower level. **(C,D)** Standard upper eyelid for a young Western woman. Deeper orbitopalpebral folds are at exactly the same level as superior-palpebral folds

Orientals, this groove is low and about 5–6 mm from the edge of the eyelid. Therefore, it can clearly be distinguished from the orbitopalpebral groove (Fig. 2) [1, 4, 5].

#### **Difference in Awareness of the Aging Upper Eyelid**

Orientals differ from Westerners with respect to the meaning of “aged eyes”: It not only represents age indicated by drooping of the upper eyelid, but also depression of the orbital area of the upper eyelid resulting in so-called sunken eyes (Fig. 3). Thus, in performing eyelid surgery to rejuvenate, it is not necessary to excise excess overlapping skin but to create a new double eyelid that is not depressed and has a fold at the low position, similar to that of young Orientals (Fig. 4).

#### **Difference in Rejuvenative Blepharoplasty Techniques for Orientals and Westerners**

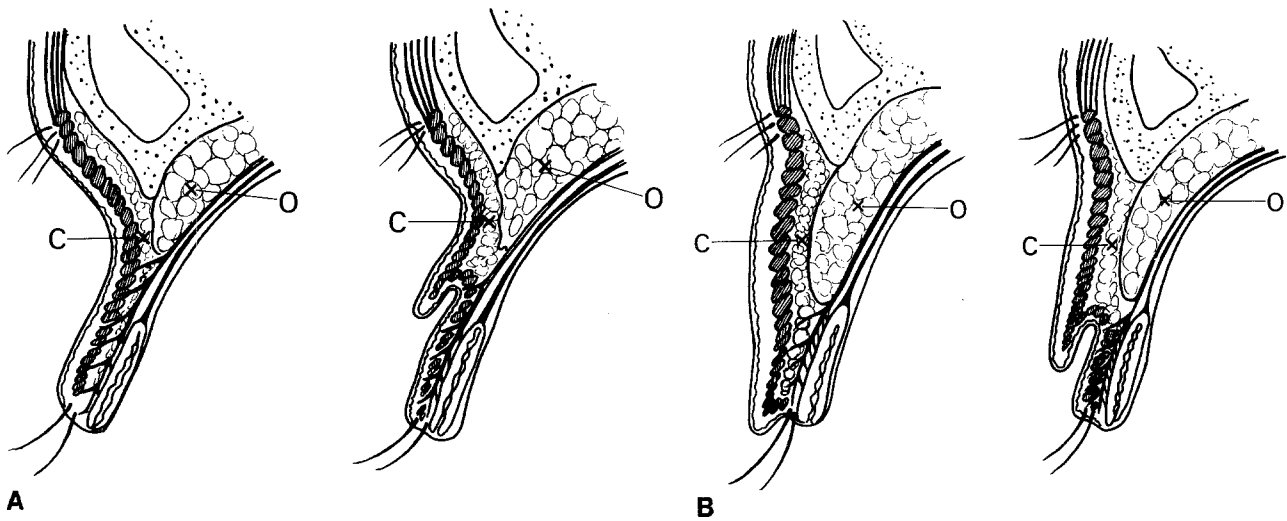
In Westerners, since the orbitopalpebral groove and superior-palpebral groove are mostly in the

same area, it is not necessary to consider the post-operative shape of the double eyelid. For this reason, it is proper to draw the upper eyelid skin upward with forceps until a light lagophthalmus has been formed, determine how much to remove, and excise.

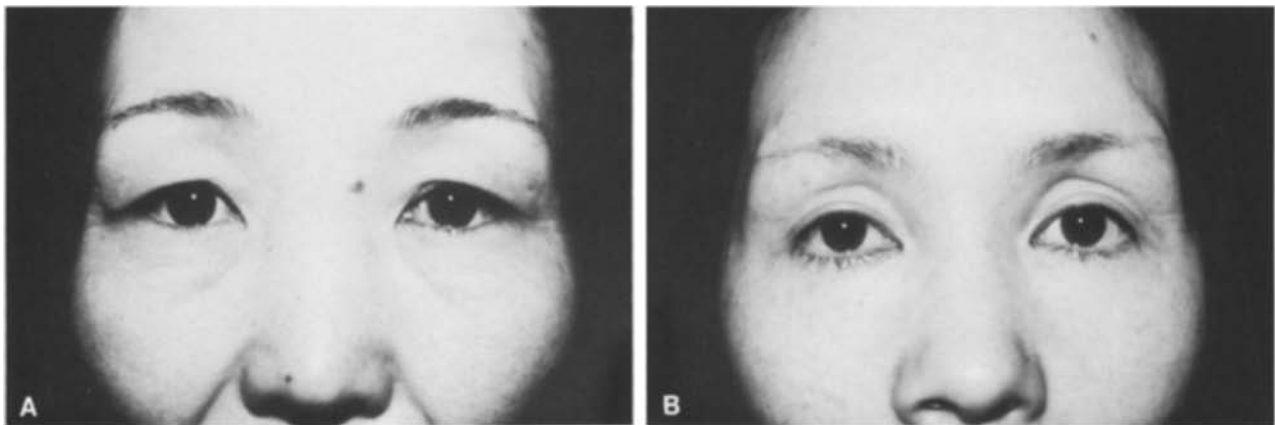
In the case of Orientals, however, skin to be excised must be predetermined while taking into consideration the desired shape of the double eyelid to be achieved. This makes it difficult to predetermine the amount of skin to be excised if using the simple technique applied to Westerners.

#### **Operative Technique**

First, have the patient close her eyes. If she has a superior-palpebral groove, slightly suppress it with your hand. If not, suppress an area about 5–6 mm above the edge of the eyelid which represents the average position of an Oriental superior-palpebral groove (Fig. 5A). Next, while maintaining suppression, have the patient open her eyes to their natural position and then form a double eyelid. Read the



**Fig. 2(A)** Pseudo-single eyelid (left) and double eyelid (right) when Western eyes are opened. **(B)** Single eyelid (left) and double eyelid (right) when Oriental eyes are opened. O = orbital fat, C = central connective tissue (retro-orbicularis fat)



**Fig. 3(A)** Hooding of upper eyelid. **(B)** Depression of upper eyelid (sunken eyes). In Orientals, these indicate aging and may need to be treated

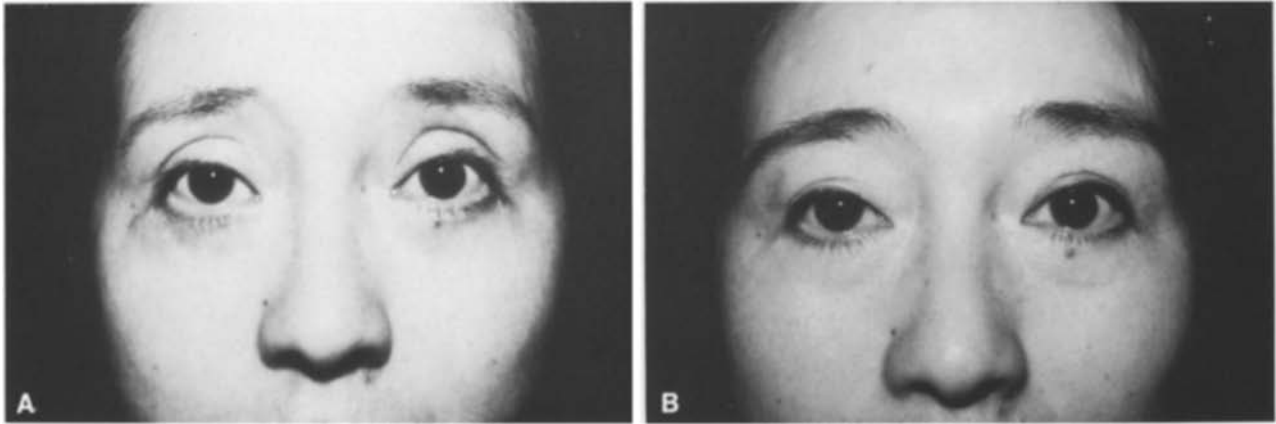
scale at the lowest margin of the hanging upper eyelid (Fig. 5B). Then, with the other hand, or an assistant's hand, gently pull the skin at the level of the eyebrow upward until the shape of the double eyelid desired by the patient is formed. Again, read the scale at the lowest margin of the upper eyelid skin (Fig. 5C). The difference between the two readings is to the distance of upward shift of the lowest margin of skin, and the maximum width of the skin to be excised is twice the difference plus 1.0–1.5 mm (Fig. 5D).

Figure 6 illustrates the above-described technique. The lowest margin of hanging upper eyelid skin when the eye is naturally gazing forward is marked as X and the lowest margin of the skin pulled upward until the desired fold is formed as X'. The difference between X (a) and X' is designated  $a$  where the skin has an upward and a downward por-

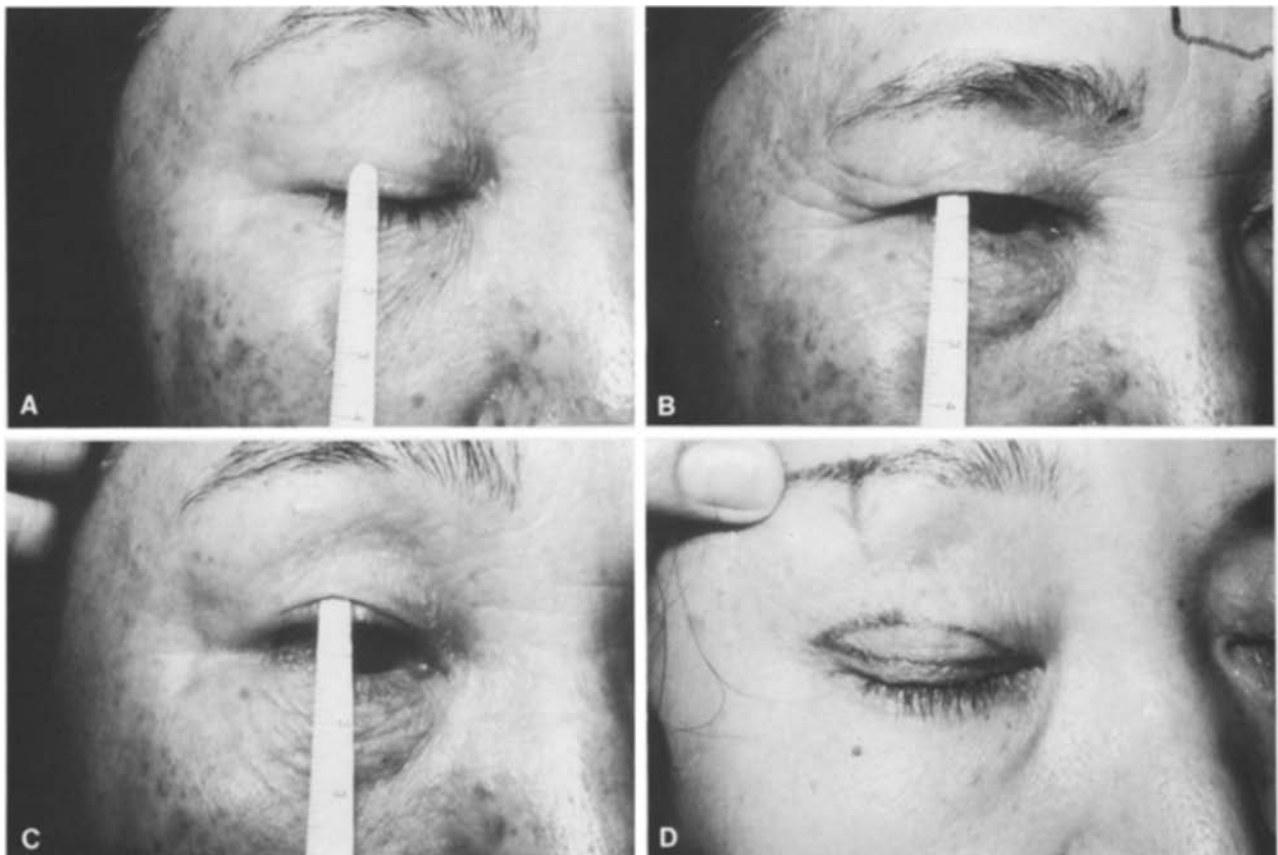
tion (b), so  $2a$  plus the skin thickness at the lowest margin, which is 1.0–1.5 mm, indicates the width of skin that should be excised.

### Case 1

A 41-year-old woman originally had a narrow double eyelid. About four to five years ago ptosis of the upper eyelid skin gave the eye a hooded look. Ptosis at both lateral canthal regions is particularly conspicuous. To prevent recurrence of hooding, excision of the orbicularis muscle was combined with fixation to the periosteum of the orbital bone. Figure 7B shows the results approximately six months postoperative.



**Fig. 4(A)** Undesirable result of an upper blepharoplasty with high tarsal fixation. When the Japanese undergo a Western-type blepharoplasty that creates the SPG at a higher position, the result is sunken eyes which look like aged eyes. **(B)** Undesirable sunken eyes were treated to obtain the shape Japanese middle-aged women prefer. The six-month postoperative view



**Fig. 5.** The operative technique. **(A)** Suppress the superior-palpebral groove. **(B)** After opening the eyes to form double eyelid, read the scale at the lowest margin of the hanging upper eyelid. **(C)** Pull skin at the eyebrow up to form desired double eyelid. Read the scale at the lowest margin of the upper eyelid. **(D)** Difference between the readings is the skin to be excised

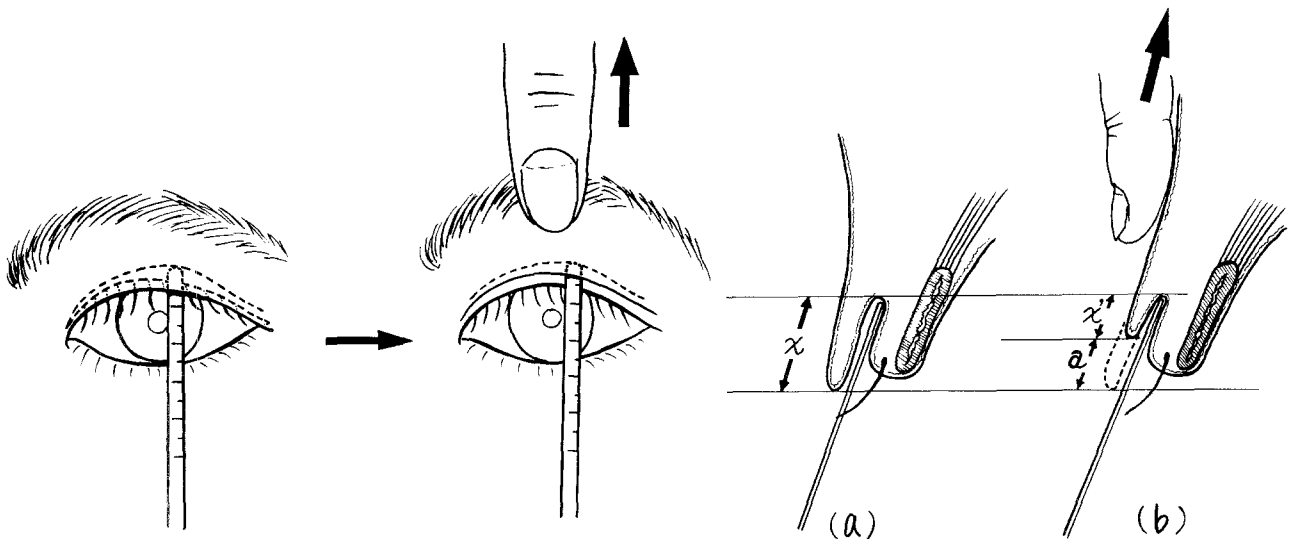


Fig. 6. Schematic of operative technique

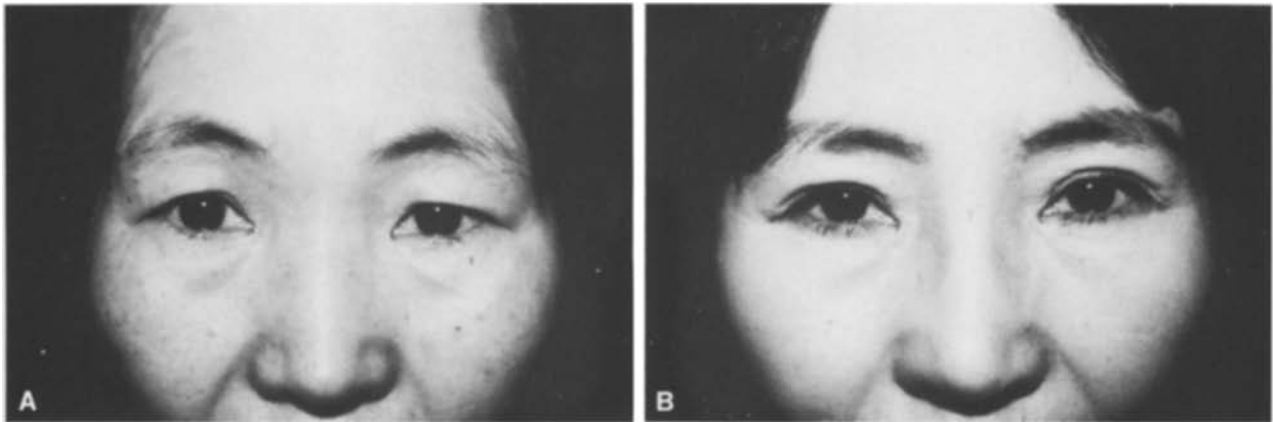


Fig. 7. Case 1: 41-year-old female. (A) Preoperative and (B) postoperative views

### Case 2

A 63-year-old woman originally had a single eyelid which made hooding caused by ptosis of the upper eyelid more prominent. To create a double eyelid with a narrow fold, the tarsal was fixed at 5 mm above the palpebral rim and a 7-mm strip of skin was excised at the maximum height. The five-month postoperative view seen in Figure 8B does not show a clear improvement because the patient did not want a drastic postoperative change. She is satisfied with this result.

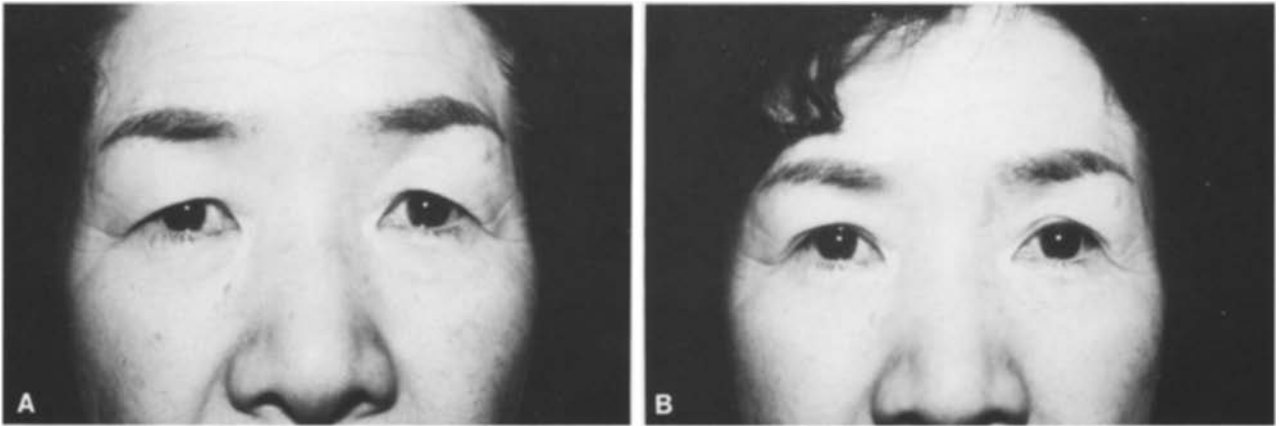
### Case 3

A 38-year-old woman had a single eyelid, and the entire upper eyelid was bulky, giving it a hooded look. In this case, the supraorbital fat and the fat

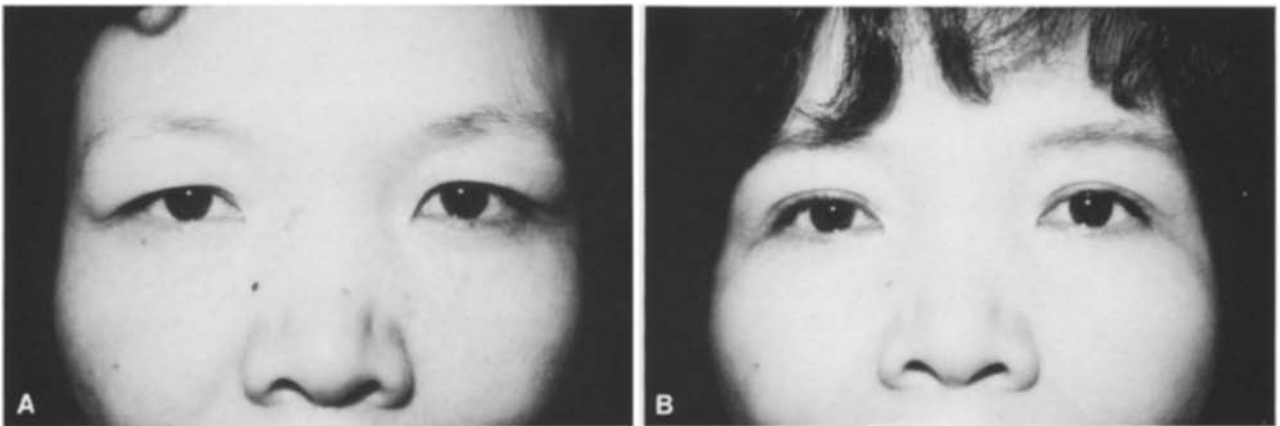
pad beneath the orbicularis muscle at the lateral region were excised to eliminate bulkiness of the upper eyelid, and a new narrow fold was created. Figure 9B shows the results approximately 11 months postoperative.

### Case 4

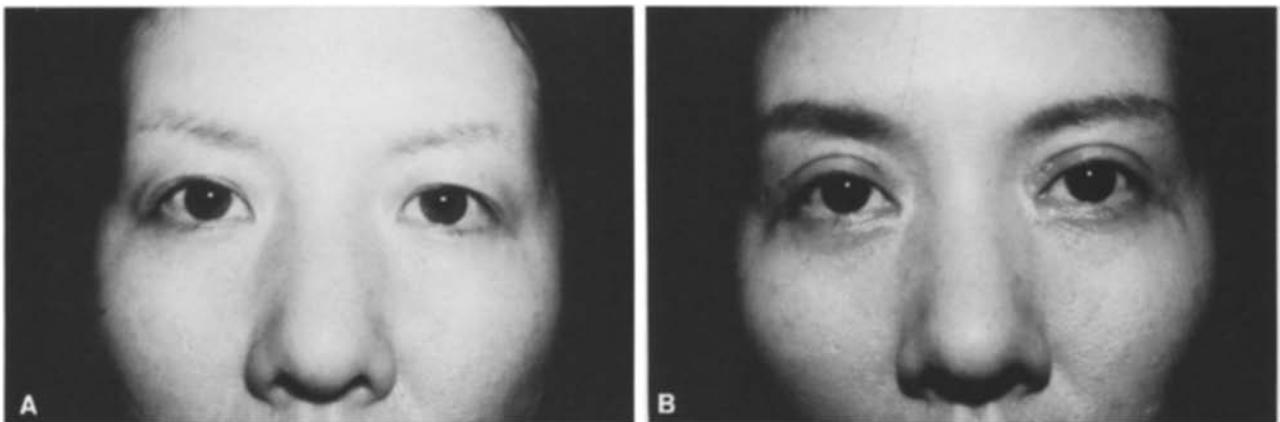
A 37-year old woman had a narrow double eyelid and the upper eyelid did not look full. She wanted to undergo blepharoplasty because ptosis of the upper eyelid skin has created a hidden single eyelid. Since the patient consciously desired to change her image, the tarsal was fixed at a higher position than normal for the Japanese to create a wider fold. Figure 10 shows the upper limit of the fold for the Japanese. A groove created at a level higher than this may frequently give an unnatural expression.



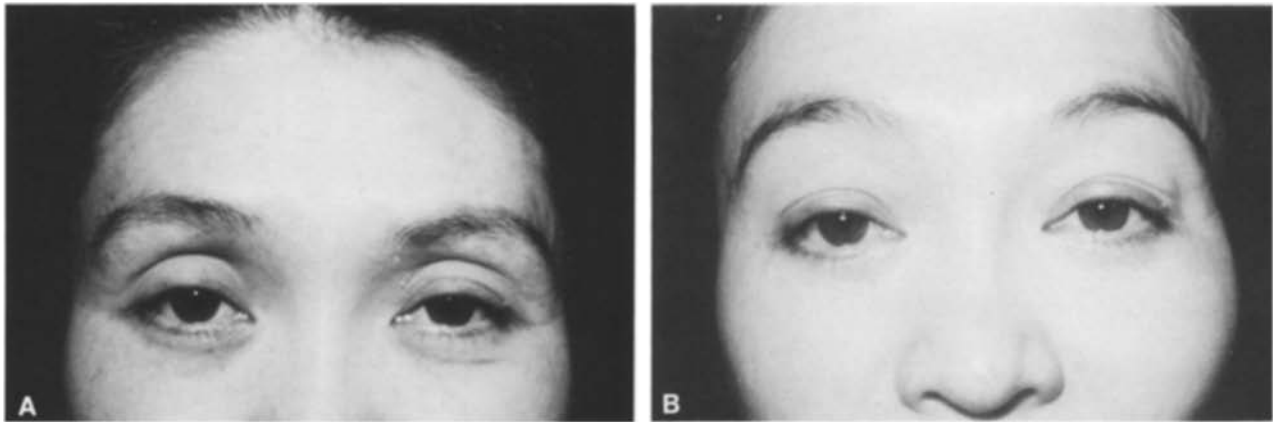
**Fig. 8.** Case 2: 63-year-old female. (A) Preoperative and (B) postoperative views



**Fig. 9.** Case 3: 38-year-old female. (A) Preoperative and (B) postoperative views



**Fig. 10.** Case 4: 37-year-old female. (A) Preoperative and (B) postoperative views



**Fig. 11.** Case 4: 37-year-old female. The Japanese double eyelid with sunken eyes was treated with fat grafting to the upper eyelid. The orbitopalpebral groove (OPG) was treated separate from SPG (A) preoperative and (B) postoperative views

## Discussion

### *Orbitopalpebral Groove and Superior-Palpebral Groove*

As stated by Vchida [11], I believe that the upper eyelid has two different grooves: the orbitopalpebral groove (OPG) and the superior-palpebral groove (SPG). The two groove are almost similar in appearance but their formation and mechanism are different.

It is generally understood that the SPG is created by levator expansion insertion to the skin. In Westerners, the level of insertion is high. In Orientals it is low, and when it is too close to the cilia it gives the impression that there is no levator expansion insertion, resulting in a single eyelid [1, 5, 11]. One cannot assume, however, that the levator expansion insertion to the skin is 10–12 mm above the tarsus because, anatomically, the septum is located in front of the levator and is attached to the upper rim of the tarsus, fusing with the levator [1, 7–9].

In Caucasians, since the septum fuses with the levator at a considerably higher position from the tarsal upper rim, the septum does not prevent levator expansion insertion at a higher level of the eyelid skin. Taking this into account, it is hard to imagine that the levator expands the skin at the height of OPG [2, 3].

Based on this assumption, it could be said that a depression located at a higher level could not be caused by insertion of the levator into the skin but rather by scanty orbital and retro-orbicularis fat. This could be supported by the fact that Oriental patients with single eyelids who do not have levator expansion insertion into the skin sometimes have a depressed OPG, a condition referred to as the so-

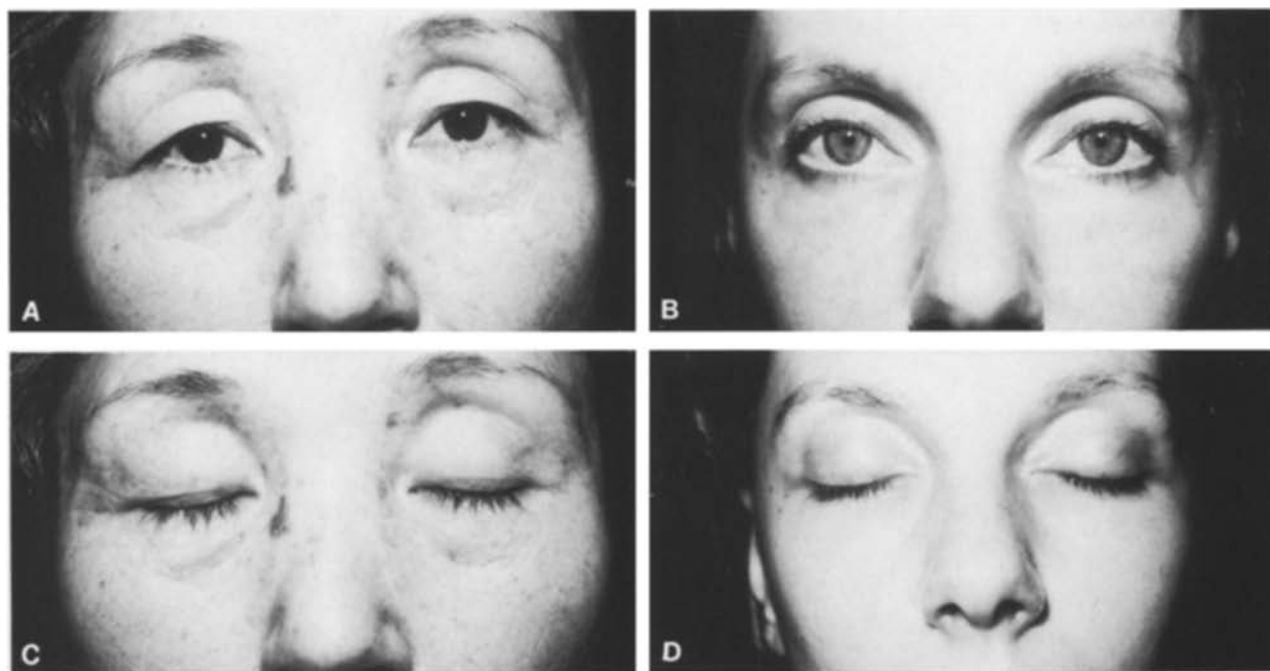
called sunken eye. Furthermore, in my experience, double-eyelided Oriental patients with sunken eyes who have both OPG and SPG can be treated by grafting fat to the OPG (Fig. 11).

Therefore, it is likely that Westerners have both OPG and SPG, but with different mechanisms. The grooves are not easily distinguished because the SPG is at a rather high level while the eyelid is thin and the OPG has an overly deep depression. That is why the eyes of some Westerners resemble the Oriental sunken eye; this is called the pseudosingle eyelid (Fig. 12).

The difference between the upper eyelids of Orientals and Westerners exists only in the insertion of the levator expansion to the skin (10–12 mm above the tarsus in Westerners and 5–6 mm in Orientals). Other critical elements that emphasize the physical differences are subcutaneous fat, fat of the central connective tissue, and an excessive amount of supraorbital fat.

### *Determining Position of SPG and Amount of Skin to Be Excised*

The basic principle of upper blepharoplasty performed for rejuvenation is excision of excessive skin and orbicularis muscle combined with supratarsal fixation and creation of a new SPG. Sheen [10] recommends that for Westerners where the original position of the SPG is lower than 7 mm, tarsal fixation must be achieved at a level above 7 mm in addition to excising excessive skin in order to prevent early recurrence. For Orientals, on the other hand, supratarsal fixation should not be above the 7-mm level in order to create a normal-appearing narrow fold of the double eyelid. This is because the SPG of the



**Fig. 12(A) and (C)** The Japanese single eyelid with sunken eyes, and **(B) and (D)** the Western pseudosingle eyelid with sunken eyes. Both eyes physically look the same

average Oriental is at a level of 5–6 mm, and the upper eyelid is thicker than that of Westerners, so the groove will become conspicuous even when the eye is closed. In addition, a longer distance between the double fold lid and the palpebral rim creates an unnatural sleepy look.

There is no special formula to use to calculate the amount of skin to be excised. For Westerners it usually is determined by pinching the closed eyelid with a pair of forceps until slight lagophthalmos is observed. It is not necessary to distinguish clearly between OPG and SPG. The SPG can be clearly distinguished in Orientals. Thus, it is critically important to preoperatively specify what kind of double eyelid to create. Accordingly, it is necessary to predetermine, with the patient seated, the position of the SPG and the amount of skin to be excised to successfully achieve the double eyelid the patient desires.

Middle-aged Oriental women are likely to reject a drastic postoperative change in their image. Thus, it is necessary to design the SPG at a lower position even though the risk of early recurrence is increased. Until now, the amount of skin to be excised had been determined by the surgeon's experience, and the results were relatively unpredictable. I devised a method to measure and determine the amount of skin to be excised. For prevention of early recurrence, it is, of course, necessary to remove excess orbital fat, to excise the lateral central region of the footpad beneath the orbicularis muscle, or to fix the orbicularis muscle to the orbital rim periosteum as

supplementary treatment. This will be discussed on another occasion [7, 8].

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