Oriental Upper Blepharoplasty

Chau-Jin Weng, M.D.¹

ABSTRACT

Aesthetic surgery of the upper eyelids is a very common procedure performed in cosmetic practices around the world. The word *blepharoplasty*, however, has a different meaning in Asia than it does elsewhere. Orientals have different periorbital anatomic characteristics, their motivations for seeking eyelid treatment are different, and operative techniques have been adapted consequently. There are also many eyelid shapes among Orientals, mostly with regard to the presence and location of the supratarsal fold and/or presence of an epicanthal fold. The surgeon must therefore master a range of surgical procedures to treat these variations adequately. It is critical to know the indications for each blepharoplasty technique as well as their complications to select the right surgery and avoid unfavorable results. Epicanthoplasty performed on the right patient can greatly improve aesthetic results while retaining ethnic characteristics. This article will discuss Oriental eyelid characteristics, preoperative patient assessment, commonly used corrective techniques for the “double-eyelid” creation, and complications and how to avoid them.

KEYWORDS: Asian blepharoplasty, double-eyelid surgery, anatomy, epicanthal fold, supratarsal fixation, aesthetic surgery, Asian, Oriental eye

Aesthetic surgery of the upper eyelids is one of the most commonly performed cosmetic surgeries in Oriental countries. There are also an increasing number of Oriental patients seeking aesthetic eyelid surgery in North America and other Western countries. As such, it is critical to understand Asians' perception of beautiful eyelids and to be familiar with anatomic and technical differences.

The Oriental blepharoplasty procedure is different from the classic blepharoplasty techniques described in Western textbooks. Seventy percent of patients requesting upper blepharoplasties in Asia are under age 30. The goal of the surgery in this young population is to create a supratarsal fold (“double-eyelid surgery”). In older patients, the goals are to create or elevate the supratarsal fold and to resect surplus eyelid skin (“Asian blepharoplasty”). Most book chapters and published

articles focus on the treatment of the aging Caucasian eyelid, where skin and fat resection are often described. Descriptions of blepharoplasty procedures for Asian eyelids are few.¹⁻⁵

In the Oriental upper eyelid, there are very few eyelid anatomic landmarks that the surgeon can rely on to guide his or her surgery. There are no preexisting supratarsal folds to guide correction. Also, the size and shape of orbits in Oriental people are quite different. Symmetric folds of attractive shape have to be created from scratch. Therefore, knowledge of anatomic structures, particularities, and variations in the Oriental eyelid and their relation to periorbital structures are vital to achieve good results.^{6,7} Understanding differences in assessment and planning for Orientals and Caucasians is key to achieve authentic results after upper blepharoplasty while maintaining ethnic characteristics. This

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article will therefore discuss Oriental eyelid characteristics, preoperative patient assessment, commonly used blepharoplasty and epicanthoplasty techniques, and complications and how to avoid them.

UPPER EYELID ANATOMY IN ORIENTALS

The most obvious feature of Oriental eyelids is the absent or very low supratarsal fold with relatively “full” periorbital tissues (Fig. 1A, B, C). There is only a very small percentage of Orientals that have an obvious supratarsal fold.^{6,8,9} Some articles focus on the anatomic difference between Caucasian and Asian upper eyelids but provide different observations and interpretations.^{1–10} Doxanas and Anderson in particular, gave an excellent and accurate anatomic description of the variations in Oriental eyelids.⁷ The fusion of the orbital septum with the levator aponeurosis determines the location of the supratarsal fold. It is at that location that the levator aponeurosis sends fibers to the overlying skin, anchoring it down to the eyelid and creating the lid fold. In Asians, this fusion between the septum and the levator aponeurosis is low, making the supratarsal fold closer to the eyelid margin. This fusion can be as low as the lower anterior portion of the tarsus near the lid margin. Because the septal-levator fusion is so low on the eyelid, retroseptal fat is allowed to “descend” in the eyelid and create an impression of a fuller and thicker eyelid.

While performing blepharoplasty incisions, surgeons encounter different anatomic structures between

Caucasians and Asians. While incising the lower part of the upper eyelid resection, the order of structures encountered in the anterior lamella will be skin, orbicularis oculi muscle, and levator aponeurosis. In Asians with a very low supratarsal fold, it will likely be skin, orbicularis oculi, septum, retroseptal fat, and then levator aponeurosis (Fig. 2). It should also be noted that the normal height of the tarsal plate in Orientals is between 8 and 10 mm (Fig. 3).

There are also skeletal differences between the orbits of Caucasians and those of Asians. The orbits of most Oriental people are comparatively smaller. The upper orbital rim is less prominent than it is in Caucasians. There is therefore less difference in depth between the supraorbital ridge and the supratarsal area (Fig. 4). Caucasians, and sometimes Orientals, present a more prominent superior orbital rim that gives a supratarsal depression. Decrease in orbital fat content with aging can cause hollowing.

Epicanthal folds seen in Orientals are commonly thought to be secondary to the lack of dermal attachments to the medial canthal ligament. Skin mobility along with poor skin tenting contributes to the formation of an epicanthal fold. The nasal bridge of Orientals is rather low in comparison with that of Occidentals. A low nasal bridge does not have as much tenting effect on the paranasal skin and tends to accentuate the epicanthal fold. However, epicanthal folds can still be observed among Orientals with a high nasal bridge, so not all deformations are accounted for by this explanation.

Figure 1 Three representative types of Oriental upper eyelid. (A) Absence of upper eyelid fold; “double eyelid” (most common). (B) Narrow but visible lid fold. (C) Obvious lid fold; least frequently seen.

PREOPERATIVE ASSESSMENT

The general assessment of Oriental patients for upper blepharoplasty is the same as that for any patient requiring eyelid surgery. It is emphasized by most plastic surgeons and oculoplastic surgeons that the examination should also focus on ophthalmologic and periorbital conditions.

The most important things to verify are the patient’s preoperative visual acuity, symmetry of upper eyelids, brow positions, or any periorbital pathologic conditions. Checking the tearing function is of utmost importance before proceeding to surgery. A borderline or mild dry-eye problem in Oriental eyes with double eyelids might not have any clinical symptom, because the drooping lid skin will act as a shield for the eyeball and prevent evaporation and desiccation of the cornea. This will likely mask symptoms that will be unveiled after eyelid fold creation. Neglecting to check for tear function can become a medicolegal problem.

The shape and location of the new supratarsal fold depends on many factors. Artistic and anatomic considerations need to be taken into account to obtain aesthetically pleasing results. The bony orbit size is the most important factor to determine the width (transverse

Figure 2 Schematic cross-sectional anatomy of the eyelid. Left: Asian eyelid. Right: Caucasian eyelid. Notice that the different level of levator aponeurosis expansions attach to the palpebral skin to create an eyelid fold at a different location. The levator aponeurosis expansion fibers exit at the junction of the septum and levator aponeurosis. These fibers anchor the skin and create a palpebral fold.

dimension) of the new supratarsal fold. Position of the eyebrows should be noted. Are they high or low? Are they symmetric? The presence of an epicanthal fold will modify the shape of the supratarsal crease. Medially, the crease will need to curve more inferiorly to finish hidden under the epicanthal fold. Prominence of the superior orbital rim and the thickness of soft tissues in the supratarsal area may also affect the ideal height and shape of the supratarsal fold. Fullness in the supratarsal area suggests considering orbital septal fat lipectomy or retro-orbicularis oculi muscle fat (ROOF) defatting to reduce bulkiness.

One common pitfall in Asians is to perform a blepharoplasty without explicitly checking for eyelid ptosis. Mild ptosis might be missed because redundant and hanging eyelid skin can mask cilia and therefore prevent

true assessment of the eyelid position. It is necessary to lift up the redundant tissue to properly examine the underlying eyelid margin and levator function.

It is a mistake to assume that Asian patients want Caucasian eyelids with an eyelid fold at 8 to 10 mm. The level and shape of the planned eyelid fold should be individualized and discussed with each patient. This situation rarely occurs in Caucasians. After listening to the patient's complaint and performing a careful physical examination, the surgeon can assess if he or she can realistically meet the patient's request. Some time is often needed to explain to the patient the limitations imposed by the anatomic characteristics of periorbital tissues, as well as expected results from surgery.

UPPER BLEPHAROPLASTY TECHNIQUES FOR ORIENTALS

The procedures for upper blepharoplasty are generally classified as *suture anchoring fixation* and *surgical* methods. These two techniques will be discussed here, as well as epicanthoplasty.

Suture Technique

This procedure was pioneered by Oriental plastic surgeons and oculoplastic surgeons in the early 1950s. This procedure has been refined and is still in use by some cosmetic surgeons.^{11–13} There are several modifications of this method, but the basic principles remain the same.

Figure 3 The average height of the upper eyelid tarsal plate in Orientals is 8 to 10 mm.

Figure 4 Typical differences in the appearances of (A) Occidental and (B) Oriental periorbital regions.

This simple procedure involves placing intradermal sutures to anchor the subcutaneous tissue or orbicularis muscle to the aponeurosis or tarsal plate. This creates an adherence and gives the impression of a supratarsal crease as the aponeurosis exerts traction to open the upper eyelid.

DESIGN AND MARKINGS

A classic suture anchoring technique is the “3-stitches” method. The center of the upper eyelid is marked 6 to 8 mm above the lid margin. A medial mark is made on the medial third of the eyelid and a lateral one is made on the lateral third. The mark on the lateral third can be marked 1 to 1.5 mm wider than the center one and the medial third can be marked at the same level of the center mark. This marking will eventually create a gentle curve that is 1–1.5 mm wider at the lateral side and gradually narrowing at the medial part to join and embed at the medial canthal fold after suture fixation is done.

PROCEDURE

After local anesthetic is injected, a 1- to 2-mm cut is made through the skin at the three skin marks. At each site, 6-0 Prolene (Ethicon, Somerville, NJ) is passed through all tissue layers and pulled through the conjunctiva (Fig. 5 Ia and Ib). The same needle is passed in

the opposite direction (from conjunctiva to subdermis) in a different track. The sutures are tied subcutaneously to create the new supratarsal fold. The skin punctures are left open and heal on their own.

Another variation of the suture method uses two stitches instead (Fig. 5, IIa and IIb). The sutures are also full thickness, but modified mattress sutures are used instead. The needle tracks are spaced 2 to 3 mm apart. All suture material is hidden subcutaneously including knots.

DISCUSSION

The advantages of this procedure are that it is simple, easy, and fast to perform. No obvious scar can be seen. The convalescent time is short compared with that for surgical correction.

The main disadvantage of the suture method is its high failure rate.^{6,7,12,14,15} The reasons are multiple. The procedure relies on a few stitches to hold together subcutaneous tissues, a small bit of orbicularis muscle, levator aponeurosis, and tarsal plate. The weak attachments provided by the sutures might be easily loosened with the powerful traction exerted by the levator aponeurosis. Another problem is that the stitch knot can often be seen when the patient closes his or her eyes. It is particularly apparent in those with thin lid skin, because

Figure 5 Different procedures of suture fixation methods for Oriental upper blepharoplasty.

the suture knot cannot be buried deeply. Rare complications can also happen such as hemorrhage and hematoma when blind sutures catch vessels and induce bleeding and hematoma.

There are many other small modifications of the suture anchoring method but the basic principles are the same, and I do not see any advantage of these modifications over the simple traditional method described here.

Surgical Resection Technique

DESIGN AND MARKING

The markings for blepharoplasty in Caucasians and Orientals are completely different. In Caucasian eyes, the preexisting supratarsal fold can always serve as a guide when planning fold repositioning. In Oriental eyes, there are no such landmarks, and the surgeon has to rely on his or her own judgment to create an entirely new supratarsal fold in an aesthetically pleasant location.

In general, the desired location of the supratarsal fold in Orientals is 6 to 8 mm superior to the eyelid margin. However, it can also be aesthetically located anywhere from 3 to 10 mm.^{2,11–13,16} This contrasts with Caucasians where it is usually located at 8 to 10 mm. In Southeast Asia, placing the fold at less than 6 mm is usually reserved for patients who present very narrow palpebral fissure with a small orbital width. Positioning it above 8 mm is rare.

The first line traced is the new location of the tarsal fold (Fig. 6). The new location of the eyelid fold is measured from the center of the eyelid margin. The redundant skin is gently pulled up by lifting the brow with one hand. Enough tension should be placed to tent the palpebral skin, but not enough to cause eversion of eyelashes. The marking extends medially with a gentle downward curve. The tip of this line should be hidden underneath the epicanthal fold and should not extend medially past the medial canthus. If the epicanthal fold is not present, the marking line does not have to be positioned as low. It would therefore be higher, similar to a tracing for Caucasians. In some cases, an epican-

Figure 6 Design and markings for the upper eyelid. The lower line denotes the location of the new supratarsal fold. The line denotes the areas of skin to be resected.

thoplasty is performed concomitantly to achieve an open-type supratarsal fold for Oriental eyes if the patient so desires. The supratarsal fold line needs to be adapted to the epicanthoplasty tracings (see the Epicanthoplasty section later).

Laterally, the marking parallels the lid margin. At the lateral fourth of the eyelid, it is curved upwards and ends at the inner margin of the lateral orbital rim. The angle of upward curving is determined by the amount of lid skin to be excised. With this design, the scar will be hidden under the supratarsal fold when the eyes are opened. The lateral end of the tracing can extend more laterally in patients with dermatochalasis. However, there will be a visible scar beyond the lateral orbital rim no matter if the eyes are opened or closed.

The second line denotes the area of skin that will be resected above the new supratarsal fold. A pair of forceps is used to estimate the amount of skin that can be excised in the medial, central, and lateral eyelid. These points are joined and fused with the previously traced line.

SURGICAL TECHNIQUE

As mentioned before, the main goal of blepharoplasty in Orientals is mainly to create a pair of supratarsal creases to enhance the appearance of the eyes and secondarily to remove excessive skin. Numerous surgical procedures have been advocated, and none are appropriate for all patients. An understanding of indications and expected outcomes for various procedures is mandatory.

Xylocaine (AstraZeneca, North Ryde, Australia) with 1:200,000 adrenaline is injected starting from the lateral aspect of the upper eyelid. It is preferable to inject the local anesthetic agent into the subcutaneous space instead of in the muscle. This space has less vascularity and allows for an easy and less painful injection of anesthetic. The infiltration of local anesthetic agent in the surrounding area is very fast. Sedation can be offered if the patient is very anxious.

The skin inside the marked area is excised. A strip of orbicularis muscle of ~2 to 3 mm height is excised with curved Stevens scissors. The orbital septum can be seen at this stage.

Local anesthetic is injected into the septal space. This balloons the orbital septum and facilitates its opening with scissors. It diminishes the chances of accidentally damaging the levator aponeurosis. It is recommended to completely open the orbital septum, from lateral to medial. With this maneuver, the distal part of levator aponeurosis as it inserts on the tarsal plate can be clearly seen and protected.

Lipectomy of orbital fat can be done if needed. The amount of fat to be excised is determined by each patient's degree of eyelid fullness. When further thinning of the eyelid is necessary, ROOF can be removed from the lateral third of the eyelid.

Figure 7 Supratarsal fold fixation with the suture anchoring technique. The suture is between the levator aponeurosis and the lower margin of the orbicularis oculi. (A) Suture placement. (B) A fold is created after tying the suture.

Supratarsal fixation is done with 3 to 4 stitches of 6-0 clear Prolene. The first suture is placed at the center of the upper eyelid. A bite is taken in the levator aponeurosis (Fig. 7). The suture is then passed through the inferior edge of the orbicularis oculi muscle. This first suture is tied down, and the patient is asked to open his or her eyes. The aesthetics of the new supratarsal fold is verified. It is also important to verify that a right amount of tension is placed on the skin covering the tarsus. To create a beautiful eyelid, the tension on the lower skin and muscle flap has to be just enough to create a subtle eversion of the eyelids. The medial and lateral sutures are applied at their predetermined location. The incision is closed with a running 6-0 silk suture. The results of upper blepharoplasty following the principle mentioned above are generally good (Fig. 8).

Epicanthoplasty

Epicanthoplasty can be done concomitantly with blepharoplasty for patients presenting a skin fold over the medial canthus (Fig. 9). However, they should be warned of the possibility of a visible scar in the medial canthal area.

Epicanthoplasty is mainly for patients who have prominent epicanthal folds and optionally for patients who have mild epicanthal folds and want to have an open type of upper lid fold.

There are several designs for epicanthoplasty. The most useful are Mustarde's jump-man, Johnson's double Z-plasty (Fig. 10), and Del Campo's Z-plasty (Fig. 11).¹⁷ I personally prefer the Z-plasty designed by Del Campo (Fig. 11).¹⁸ The advantages of this design

are that it results in a short scar, and no scar is placed on tension lines. It is very effective at smoothing out the epicanthal fold to show the medial canthus. The procedure design described here is modified to accompany an upper blepharoplasty in Asians.

MARKINGS

A point is marked on the epicanthal skin where the most medial point of the medial canthus is located (Fig. 12). A line is extended laterally to the edge of the epicanthal fold. The lowest point of the epicanthus is identified. A line is extended from this point, along the epicanthal fold edge, and joined to the blepharoplasty incision. The epicanthal fold is flattened by pulling the skin medially on the nasal bridge. A line is drawn for the lowest point of the epicanthal fold (identified previously) and extended superiorly and laterally to the lower eyelid border, 2 to 3 mm medial to the punctum. This is a form of Z-plasty.

SURGICAL TECHNIQUE

The incision and dissection of these flaps are done along with upper eyelid incisions. The flap is inserted after the supratarsal fold fixation (Fig. 13). The excessive skin is trimmed on each flap to fit the area of the defect. Suture is done with 6-0 silk interrupted stitches. The inserted photos showed the results after epicanthoplasty (Fig. 14).

POSTOPERATIVE CARE

Patients are instructed to use apply cold packs for 10–15 minutes per hour for 48 hours while they are awake. This reduces swelling and possible postoperative bleeding. Warm packs start on the third day after surgery to speed up the resolution of bruising. Stitches

Figure 8 Pictures of patients before and after upper blepharoplasties. (A-1) Patient 1, preoperative; (A-2) patient 1, 2 weeks postoperative; (B-1) patient 2, preoperative; (B-2) patient 2, 2 weeks postoperative; (C-1) patient 3, preoperative; (C-2) patient 3, 4 weeks postoperative; (D-1) patient 4, preoperative; (D-2) patient 4, 2 weeks postoperative.

Figure 9 Some patients with obvious epicanthal folds will need to have epicanthoplasties to enhance upper blepharoplasty results.

Figure 10 Mustarde's jump-man and Johnson's double Z-plasty.

are removed at postoperative days 5 to 7. Gentle massage of the eyelids can then be started to decrease postoperative edema and soften the scar.

COMPLICATIONS

Postoperative Hemorrhage

Postoperative bleeding usually manifests itself within the first 48 hours after surgery. Forceful coughing, sneezing, or even heavy exertion can lead to increased blood pressure, which could open sealed blood vessels stumps. If there is any evidence of bleeding, the vessel must be cauterized and the clot evacuated. Retrobulbar bleeding is very dangerous and can lead to blindness if it goes undetected.

Gradual Fading of the Supratarsal Fold

Gradual postoperative disappearance of lid folds is one of the common complaints of patients who have had upper blepharoplasties to create a supratarsal crease. This is mainly caused by the loosening of supratarsal fixation.¹⁶ Such an event is unfortunate as the creation of folds is the primary goal of surgery.

There are two explanations for the disappearance of the supratarsal folds: knot loosening at the supratarsal fixation and dislodgment of sutures on the levator aponeurosis or orbicularis oculi muscle. Sutures can sometimes cut through these tissues or just be avulsed.

It also appears that resorbable sutures for fold creation are inadequate. As they resorb, the supratarsal crease loosens gradually and the fold disappears.

Figure 11 Del Campo's procedure for epicanthoplasty. (A) Schematic drawing of the design; (B) intraoperative picture of the design.

Figure 12 Drawing showing the transfer of the skin flap to the medial canthal area.

Chromic gut or Dexon suture (Davis-Geck, Manti, Puerto Rico) are therefore inadequate suture materials.¹⁹

Asymmetry

The most frequent complication is asymmetric upper lid folds.^{11,15,16,20} This problem is usually caused by poor surgical design and markings. It is strongly suggested to use a ruler when performing markings to prevent asymmetries. Another cause of asymmetry comes from marking the height of two lid folds under different skin tension.

Exaggerated High or Low Supratarsal Folds

The most frequent cause of unnatural looking eyelids after blepharoplasty in Orientals comes from placing the supratarsal crease too high (Fig. 15). The placement of the lid fold must be adjusted to the patient's periorbital morphology.

The aesthetically desirable supratarsal fold height in Asians is generally between 6 and 8 mm above the

midpoint of the upper eyelid margin. Placing it lower than 6 mm will likely not result in a visible change. Placing it higher than 8 mm can cause confusion regarding the ethnicity. It can also hinder the excursion of upper eyelids and cause mechanical ptosis. These problems will need revision to reduce the height of the lid fold to a lower level.¹⁸

Ptosis

One of the most troublesome postoperative complications is eyelid ptosis revealed only after surgery. There are three possible factors that might cause postoperative ptosis (Fig. 16).¹⁵ The first one is the "latent" ptosis. Because most Oriental people have very low or even no supratarsal fold, a mild ptosis of the upper lid will be hidden underneath overhanging lid skin. It is very hard to notice preoperatively unless the surgeon examines attentively the eyelids after displacing redundant eyelid skin. The ptotic eyelid position will become visible after surgery.

The second factor that can cause de novo postoperative ptosis is iatrogenic levator aponeurosis damage during opening of the septum. This is especially true in those patients who have very little retroseptal fat, causing the orbital septum to lie in very close proximity to the aponeurosis. Fortunately, this problem can usually be identified during surgery when the patient is asked to open his or her eyes to adjust the height of the supratarsal fold.

The last factor that can cause eyelid ptosis after surgery is when the supratarsal fold is placed too high and restricts levator excursion. The scarring from surgery and the supratarsal fixation will hit the superior orbital rim when attempting to open the eyelid. The upper eyelid will not be able to make its full excursion and will eventually give the appearance of mechanical ptosis.^{15,17,19}

Figure 13 Skin flaps tend to insert spontaneously after dissection is completed and tension lines released.

Figure 14 Epicanthoplasty as an adjunct to blepharoplasty: (A-1) before and (A-2) 12 days postoperative; (B-1) before and (B-2) 2 months postoperative; (C-1) before and (C-2) 2 weeks postoperative; (D-1) before and (D-2) 2 weeks postoperative.

Figure 15 An excessively high supratarsal fold looks unnatural. (A) After inadequate supratarsal fold positioning by another surgeon. (B) Result after repositioning the fold in an appropriate location.

Figure 16 Blepharoptosis can be aggravated after failing to diagnose preoperative ptosis. It can also result from iatrogenic trauma to the levator aponeurosis during surgery. (A) Postoperative ptosis, before revision. (B) The result after revision.

Figure 17 Supratarsal depression might be due to degenerative atrophy of orbital fat or might be caused by excessive lipectomy during blepharoplasty. (A) Postoperative depression, before revision. (B) Postoperative results, 4 weeks after revision.

Supratarsal Depression

The supratarsal area of Oriental eyes usually appears full. However, there is an occasional patient who presents with a rather flat or depressed supratarsal area. This appearance will be worsened if lipectomy is performed routinely in all patients (Fig. 17). Excessive fat resection can also lead to a similar outcome.

A depression can also be caused by adherences between the orbital septum and the levator aponeurosis.^{15,20} This problem is thought to be caused by aggressive manipulation of the orbital septum and levator aponeurosis during surgery, which induces scarring and retraction. Upon activation, the levator will pull on the eyelid and on the orbital septum as well because of scarring. This will produce a depression. It can also be associated with blepharoptosis (see the Ptosis section above).^{16,18,20}

CONCLUSION

Oriental eyes have particular features, anatomy, and variations. There are aesthetic criteria particular to Orientals for what constitutes a desirable supratarsal fold placement and epicanthal fold treatment. Creating supratarsal folds that are beautiful to both the patient and the surgeon can be quite challenging. It requires thorough preoperative discussion with the patient. Understanding of underlying anatomic characteristics is essential for treatment planning and prevention of complications.

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