# A modified mini-incisional technique for double-eyelid blepharoplasty

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**BACKGROUND:** Double-eyelid blepharoplasty is one of the most popular cosmetic surgeries in Asia.

**OBJECTIVE:** To introduce a modified mini-incisional technique to form a double eyelid.

**METHODS:** A total of 372 patients (325 women, 47 men) were involved in the study between July 2008 and August 2014. Their age ranged from 16 to 34 years, with a mean age of 24 years. All patients underwent the modified mini-incisional upper blepharoplasty. In the technique, four 2 mm incisions were made along the designed fold. The orbicularis muscle overlying the levator aponeurosis was removed. The removal of the lateral fat pad was completed accordingly. The medial fat pad was also removed if necessary. Suture was used to fix the skin to pretarsal fascia along the double-eyelid line. The double-eyelid crease was formed after the operation.

**RESULTS:** The follow-up period was three to 12 months (mean nine months). Most of the double eyelids were natural. During the follow-up period, 92% (342 of 372) patients were satisfied with the blepharoplasty. The most common complications were swelling within first week after the operation, which subsided spontaneously. Asymmetries occurred in 17 patients; six patients had multiple eyelids and seven patients experienced shifting of the fold. These were corrected six months after the operation. Disappearance of the fold was not observed. The scars of the stab incision became invisible after one full year of recovery. No other severe complications were found.

**CONCLUSION:** The four mini-incisional blepharoplasty technique was successful for the formation of a natural-appearing and long-lasting double eyelid. Except for individuals with obvious skin redundancy, patients with a single eyelid are suitable candidates for the technique.

Key Words: Double eyelid; Modified mini-incisional technique; Single eyelid

It is commonly accepted that double-eyelid surgery results in largerappearing eyes, a soft and womanly appearance, clear-cut features and a refreshed appearance to the face (1). Upper eyelid blepharoplasty is one of the most popular cosmetic surgeries in Asia because nearly one-half of the Asian population lacks a supratarsal fold (2). The first cutaneous suture technique was devised by Mikamo (reported by Lam [3]). Various methods have been described, broadly including the incisional, nonincisional and mini-incisional methods (4). The present article introduces a modified mini-incisional technique.

#### METHODS

A total of 372 patients (325 women and 47 men) were involved in the study between July 2008 and August 2014. Their age ranged from 16 to 34 years (mean 24 years of age), and all underwent the modified mini-incisional upper blepharoplasty. Bilateral surgeries were performed in 341 patients and unilateral procedures in 31 patients. The follow-up period was three to 12 months (mean nine months) to evaluate the effect. Patient satisfaction was evaluated three months postoperatively. Satisfactory results indicated no multiple eyelids, no shifting or disappearance of the fold, and symmetrical heights of the

## Une technique de mini-incisions modifiée pour la blépharoplastie asiatique

**HISTORIQUE :** La blépharoplastie asiatique est l'une des chirurgies plastiques les plus populaires en Asie.

**OBJECTIF** : Présenter une technique de mini-incisions modifiée pour former un pli palpébral.

MÉTHODOLOGIE : Au total, 372 patients (325 femmes, 47 hommes) ont participé à l'étude entre juillet 2008 et août 2014. Ils avaient de 16 à 34 ans, pour un âge moyen de 24 ans. Ils ont tous subi une blépharoplastie asiatique par mini-incisions modifiées. Les chirurgiens ont pratiqué quatre incisions de 2 mm le long du pli désigné. Ils ont effectué l'exérèse du muscle orbiculaire recouvrant l'aponévrose du muscle releveur et celle des tissus graisseux latéraux, puis ont procédé à celle des tissus médians, au besoin. Ils ont réalisé une suture pour fixer la peau au fascia prétarsal le long de la ligne du pli. Le pli palpébral a été formé après l'opération.

**RÉSULTATS :** La période de suivi était de trois à 12 mois (moyenne de neuf mois). La plupart des plis palpébraux avaient un aspect naturel. Pendant la période de suivi, 92 % des patients (342 sur 372) étaient satisfaits de la blépharoplastie. Les principales complications étaient une enflure pendant la première semaine suivant l'opération, qui s'est résorbée spontanément. Dix-sept patients ont présenté une asymétrie; six patients avaient de multiples plis et sept patients ont présenté un déplacement du pli, qui a été corrigé six mois après l'opération. Aucun pli n'a disparu. Après une année complète de convalescence, les cicatrices des incisions étaient devenues invisibles. Aucune autre grave complication n'a été observée.

**CONCLUSION :** La technique de blépharoplastie par quatre miniincisions permet de former un pli palpébral supérieur d'aspect naturel à long terme. À part chez les personnes qui présentent une redondance cutanée évidente, les patients qui ont des paupières asiatiques sont de bons candidats à cette intervention.

fold when the difference between the bilateral heights was  ${<}1$  mm. Complications were recorded.

#### Preoperative evaluation

The desires of the patients were understood during consultation and they were taken into consideration before the operative design. With the patient sitting, the height and shape of the desired double-eyelid line were simulated. A probe was used to push the upper eyelid upward to form a crease in front of a mirror. The crease position was confirmed when the patient was satisfied with the simulated crease, which was usually approximately 7 mm to 10 mm above the ciliary margin. The symmetry of the line on the bilateral upper eyelid was verified. The proposed double-eyelid line was marked using a marker pen. All patients were photographed pre- and postoperatively.

#### Surgical procedure

The operation was performed under local anesthesia. 1% lidocaine (5 mL) containing 1:100,000 of epinephrine was injected into each eyelid. Four 2 mm incisions were made along the double-eyelid line. Point A was approximately 5 mm lateral to the medial canthus. Point D

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Figure 1) Preoperative design. Four 2 mm incisions (A, B, C, D) were marked along the double-eyelid line



Figure 2) The suturing technique and relevant anatomy. A The suture. B Aponeurosis. C Skin. D Subcutaneous tissue. E Orbicularis muscles. F Fat. G Orbital septum. H Levator and Miller's muscles. I Palpebral conjunctiva. J Tarsus

was also 5 mm medial to the vertical line of the lateral canthus. Points B and C were between A and D, and each point was 7 mm to 9 mm apart (Figure 1).

Scissors were used to remove the orbicularis muscle from the upper eyelid in three directions: down (toward the palpebral margin), left and right. The subcutaneous tunnels between the incisions and the palpebral margin were formed after removal of the muscles. After subcutaneous fat and the orbicularis muscle was excised, the septum was exposed. The lateral fat pad was cauterized and removed accordingly. The medial fat pad was also removed if necessary.

7-0 silk suture was first inserted through the skin below the incision line and subsequently passed through the pretarsal fascia horizontally. By gently pulling the needle, the upper eyelid was lifted at this time. The thread exited the skin above the incision and was ligated to close the incision (7). The fixation point on the pretarsal fascia was at the upper border of the tarsal plate (Figure 2). After suturing, the patient was asked to sit up to verify the shape and symmetry of the newly formed double eyelids when the patient's eyes were open. The sutures could be adjusted according to the patient's request.

A thin layer of antibiotic ointment was applied to the newly created crease. A sheet of oil gauze and dry gauze were used to cover the upper eyelids. The cover was removed the next day. The incisions were protected using antibiotic ointment twice per day for seven days. The sutures were removed one week after the operation.

#### RESULTS

Most of the double eyelids were natural after complete recovery. During the follow-up period, the satisfaction rate was 92% (342 of 372) (Table 1). Representative cases are shown in Figures 3 to 7. Asymmetries occurred in 17 patients. Six patients had multiple eyelids, seven patients experienced shifting of the fold. They were corrected six months after the operation. Disappearance of the fold was not observed. The scars of the stab incision became invisible after a full year of recovery (Figure 8). The most common complications were swelling within first week after operation. Usually, the swelling

#### TABLE 1

Patient (n=372) satisfaction rate three months postoperatively

Characteristic	n (%)
Female sex	325 (87)
Male sex	47 (13)
Satisfaction	342 (92)
Dissatisfaction	30 (8)



Figure 3) A 22-year-old woman before (left) and one week after (right) the operation



Figure 4) A 21-year-old woman before (left) and two weeks after (right) the operation



Figure 5) A 26-year-old woman before (left) and three weeks after (right) the operation

subsided spontaneously one month after the procedure. In 12 cases, the swelling lasted >3 months. Subsequent bleeding from the incisions occurred in 26 patients and was controlled by slight pressure with gauze. No other severe complications were reported (Table 2).

#### DISCUSSION

Upper-eyelid blepharoplasty is a very common procedure in aesthetic plastic surgery. The anatomical structural difference between the single and double eyelids is established. Siegel (5) showed that in the single eyelid, the orbital septum was fused to the levator aponeurosis below the superior tarsal border, whereas fusion was above the superior tarsal border in the double eyelid. Descent of the orbital septum and retro-orbicular fat prevent the fibres of the aponeurosis from extending to the skin; therefore, no supratarsal fold is formed (6). Establishing a firm connection of skin and supratarsal aponeurosis is essential for formation of the double eyelid. Thus, the goal of double-eyelid operations is to create a link between the skin and levator aponeurosis or tarsal plate (7).

There are many types of procedures to create the double eyelid. Techniques for double-eyelid surgery can be roughly classified into open, nonincisional and semi-open procedures (8). These methods have different advantages and disadvantages.

Lam (3) described the Mikamo method (circa 1986), and Uchida (9) published his technique in 1926. The nonincisional technique currently exists in many forms. The essence is to create a loop that 'bites' into the tarsal plate and the overlying dermis to create a 'fixation' point that allows the eyelid skin to fold when the eyes are open. The nonincisional technique is easy, has a fast recovery and produces no visible scar (10,11). Nevertheless, the skin is fixed to the levator aponeurosis by suture; however, the connection is not as secure as the incisional technique and, for this reason, the fold is usually not durable. Moreover, excessive orbital fat may migrate to the area of fixation and jeopardize the effect of suturing (12). The fold disappearance rate for nonincisional blepharoplasty varies from 1.3% to 16.8 % (13).



Figure 6) A 26-year-old woman before (left) and 3 weeks after (right) the operation



Figure 7) A 21-year-old woman before (left) and 1 year after (right) the operation



**Figure 8)** Preoperative view (left). One year after operation, the scar was invisible when the eye was closed (centre). The double eyelid was natural and satisfactory (right)

In the open technique, a long incision is made. A sheet of skin, muscle and fat along the fold are removed, and sutures are used to attach the skin to tarsal plate (14,15). The manoeuvre has the effect of fixing the dermis to the underlying tarsal plate. The dermis and levator aponeurosis/tarsal plate are held closely together with the cicatrix; thus, an upper eyelid crease is created (16). However, injury to the blood vessel and lymphatic drainage is extensive. In some cases, the swelling period has been reported to be from three months to a full year (17). The unavoidable scars on the upper eyelid are conspicuous when the eyes are closed.

Although many mini-incisional techniques have been developed in recent years, the three mini-incisional method becoming more popular (18). A large amount of pretarsal tissue is removed through three mini incisions. The skin is anchored to the pretarsal fascia by three sutures before the cicatricial connection is formed. Our four

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### TABLE 2

#### Postoperative complications (372 patients)

Complication	Occurrence, n (%)
Asymmetry	17 (4.6)
Shifing of the fold	7 (1.9)
Multiple eyelids	6 (1.6)
Disappearance of the fold	0 (0)
Subsequent bleeding	26 (7.0)
Prolonged edema (>3 months)	12 (3.1)
Obvious scars	0 (0)
Infection	0 (0)

mini-incisional technique is a modification of the three mini-incision technique. Each of the four incisions is designed to be <2 mm in length. Although the change is not drastic, the new method has several advantages. First, the shorter incision means less damage to the surrounding tissues; consequently, the swelling period is significantly shorter. Second, the shorter incision results in an inconspicuous scar after complete recovery. The scars on the upper eyelids are nearly invisible a full year after the procedure. Third, the four-point fixation between the skin and supratarsal aponeurousis is more durable. In the meantime, the double eyelid is smoother. Therefore, the double eyelid appears more natural. Finally, the medial fat pad is also removed in the new method; therefore, puffy eyelids are changed into slim eyelids. The appearance of the upper eyelids are similar to those in Caucasians after surgery. The procedure makes the newly created double-eyelid appear natural and beautiful after complete recovery.

#### CONCLUSION

Our modified four mini-incisional technique has more benefits than the usual mini-incisional techniques. The four mini-incisional blepharoplasty technique is successful in formation of a natural-looking and long-lasting double eyelid. Except for individuals with obvious skin redundancy, patients with the single eyelid are suitable candidates for the technique.

**DISCLOSURES:** The authors have no financial disclosures or conflicts of interest to declare.

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