



Orbicularis—levator—tarsus composite suture technique in double-eyelid operation

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Summary *Objective:* Fold loss and suture extrusion are fairly common in double-eyelid surgeries. We hereby explore a new composite suture technique that aims to reduce such complications and to improve the long-term aesthetic outcome.

Methods: Based on the conventional external incision procedure, the suture procedure in our technique involves three stitches that fixate the orbicularis oculi, the levator aponeurosis, and the tarsal plate. This modified upper-eyelid blepharoplasty was performed in 98 patients (91 female and seven male, 196 eyes) with either congenital absence of the upper-eyelid folds ($n = 84$) or loss of fold from previous procedures ($n = 14$). The patients were followed up for 6–30 months. The complications were documented, and the overall outcomes of upper-eyelid folds were evaluated by both surgeons and patients as excellent, good, fair, or poor.

Results: Among 98 patients, 89 (91%) had excellent results and nine (9%) had good results; no patient had fair or poor results. Four patients had scar formation at postoperative week 2, all resolved without particular treatments at 6 months. The buried sutures could not be seen or felt through the skin. In addition, no suture extrusion was noted. There was no case of faded or disappeared folds during the follow-up. All patients were satisfied with the outcome.

Conclusions: The composite suture technique ensures a firmer fixation and improves the aesthetic outcomes. It is a highly applicable and reliable approach for upper-eyelid blepharoplasty.

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Introduction

Fifty percent of the population in China, Japan, and Korea are born without an upper-eyelid fold^{1,2}; their skin is relaxed, due to the lack of supratarsal fixation, resulting in a slit-eye appearance. As a result, double-eyelid surgery is predominantly popular among East Asians.³ The supratarsal crease is formed by dermal insertion at the confluence of the septum and levator aponeurosis.⁴ Various approaches, including the incision method,⁵ the semiopen method,⁶ the suture method,⁷ and the sutureless method,⁸ have been utilized to create a more prominent fold. Regardless of the nomenclature, the principles of these surgeries can be categorized into either non-incision minimally invasive techniques or incision-based fixation techniques; each method has its merits and limitations. Among all these methods, the incision method has been considered the approach with the widest indications and the most reliable results.⁹

In traditional incision-based blepharoplasty, sutures firmly fixate the pretarsal skin to the aponeurosis or tarsus, after which the skin is advanced over the tarsus while the eyes are open, therefore creating the upper-eyelid fold. This method has a low recurrence rate; nevertheless, each time the eye blinks, a jerk force is exerted on the levator aponeurosis and eyelid skin. These repetitive strains will loosen the scar from incisional fixation over time, and the soft tissue remaining on the tarsal plate will interrupt the attachment of the pretarsal skin and the tarsus, causing the crease to fade or even to disappear.

Another limitation of this technique is that the pretarsal orbicularis oculi muscle is usually removed to a great extent so as to ensure adhesion between the dermis/skin and levator aponeurosis. As a result, the spitting out of sutures is a common complication due to their superficial placement. In addition, the new creases are hollow looking, and they lack vividness; the eyes look less vibrant and natural.

In such cases, it is necessary to explore a different approach, one that could, to a maximal degree, simulate the anatomical and physiological mechanisms by which double-eyelid folds are created, therefore leading to a more reliable attachment of upper-eyelid skin to the muscle and the tarsus, which in return could maintain a more durable and aesthetically pleasant upper-eyelid fold. We hereby attempt to explore and validate such a method, using the mattress-like suture technique that fixates the orbicularis oculi–levator aponeurosis–tarsal plate as a composite entity, so as to provide for a firmer adhesion and an enduring effect with satisfactory outcomes.

Methods

Patient information

From October 2009 to June 2013, this modified upper-eyelid blepharoplasty technique was utilized to treat 98 patients (91 female and seven male, 196 eyes) with either congenital absence of the upper-eyelid fold ($n = 84$) or loss of fold from previous procedures ($n = 14$). The patients ranged in age from 17 to 35 years (average age 26.5 years). Patients were mentally healthy and gave consent for undergoing the

external blepharoplasty. All surgeries were performed by the same surgeon.

Preoperative design and preparation

The design and the preparations have been previously described by other studies.¹⁰ Briefly, the incision lines are designed and marked at a height of 6.5–7.5 mm from the margin of the eyelash. The patients' own preference of the width of the fold is also taken into consideration. At this height, two points 5 mm to the midpupillary line on the orbital skin are pushed up with a pair of forceps with the eyes open in a straight gaze, thereby simulating the shape of the new upper-eyelid fold. Minor adjustments on the medial and lateral sides are made to better suit each patient. For those eyelids with excessive or loose skin, a second line is drawn at a height of 6.5–7.5 mm from the margin of the eyelash, with the skin gently stretched until either wrinkles in the upper eyelid disappear or the eyelash just starts to move. This elliptical area is marked for excision. The operative field is sterilely prepped and draped. Local anesthesia is administered by injecting 1 mL of 1% lidocaine with 1:100,000 epinephrine using a 27-gauge, 1-in. needle.

Exposure

The operation starts 10–15 min after anesthesia. An incision is made with a No. 11 blade based on the incision line through the skin. The incision separates the skin into the supratarsal and pretarsal lips, and it completely transects the orbicularis oculi muscle. The dissection then continues to the orbital septum. For those with excessive skin, two incisions lines are made, and the skin and a strip of orbicularis muscle as well as loose connective tissue underneath are removed. A strip of wedge-shaped orbicularis oculi of the pretarsal lip is also removed. Then the orbital septum is unfolded laterally and medially to expose the entire levator aponeurosis. Once the thin capsule is open, the fatty tissue may bulge out itself or it can be pressed out with gentle force and then removed. The levator aponeurosis is widely exposed as a pale white, reflective membrane that can be easily distinguished from the orbital septum.

Orbicularis–levator–tarsus composite suture

Suture and fixation in the conventional procedures basically involve closing the incision with the stitches passing through pretarsal skin to the levator aponeurosis and then the supratarsal skin. In our technique, the first suture point is placed at the midpupillary point, and the 6/0 absorbable suture (Coated VICRYL[®] (polyglactin 910) Suture, Ethicon, Somerville, NJ, USA) is started with horizontal stitching through the superficial layer of tarsal plate, going outwards. The suture is passed through the levator aponeurosis and the orbicularis oculi of the pretarsal lip, 2 mm to the margin of each structure. Then the suture is turned and inverted, this time going inwards, first stitching back through the orbicularis oculi, 2 mm medial to the point where it comes out, and then passing the orbital septum

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