

Aesthetic Lateral Canthoplasty

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Introduction: To report our technique and experience in using a minimally invasive approach for aesthetic lateral canthoplasty.

Methods: Retrospective analysis of patients undergoing lateral canthoplasty through a minimally invasive, upper eyelid crease incision approach at Jules Stein Eye Institute by one surgeon (R.A.G.) between 2005 and 2008. Concomitant surgical procedures were recorded. Preoperative and postoperative photographs at the longest follow-up visit were analyzed and graded for functional and cosmetic outcomes.

Results: A total of 600 patients (1,050 eyelids) underwent successful lateral canthoplasty through a small incision in the upper eyelid crease to correct lower eyelid malposition (laxity, ectropion, entropion, retraction) and/or lateral canthal dystopia, encompassing 806 reconstructive and 244 cosmetic lateral canthoplasties. There were 260 males and 340 females, with mean age of 55 years old (range, 4–92 years old). Minimum follow-up time was 3 months (mean, 6 months; maximum, 6 years). Complications were rare and minor, including transient postoperative chemosis. Eighteen patients underwent reoperation in the following 2 years for recurrent lower eyelid malposition and/or lateral canthal deformity.

Conclusions: Lateral canthoplasty through a minimally invasive upper eyelid crease incision and resuspension technique can effectively address lower eyelid laxity and/or dystopia, resulting in an aesthetic lateral canthus.

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Reconstruction of the lateral canthal angle is an important component in the rehabilitation of the aging face and an unfortunate necessity after failed lateral canthal surgery. Because the lateral canthus unites half of the upper eyelid–forehead continuum with the lower eyelid–midface continuum, its proper restoration to youthful anatomic structure is of paramount importance. Indications for lateral canthoplasty include horizontal eyelid laxity, entropion, ectropion, lateral canthal dystopia, and aesthetic rejuvenation. The fundamental underlying biologic principle leading to all of these conditions

is loss of lateral canthal support from gravitational or other mechanical factors.¹

The concept of tightening of the lower eyelid at the lateral canthus (as opposed to shortening the eyelid by midlid resection) was first popularized by Bick in 1966.² Since then, various methods have been described for the reconstruction of the lateral canthus, with varying success.^{1,3–27} The evolution of surgical techniques has been driven by unsatisfactory postoperative results.

Herein, we describe our technique and experience in using a minimally invasive approach for aesthetic lateral canthal reconstruction.

METHODS

The charts of all patients undergoing lateral canthoplasty at Jules Stein Eye Institute by one surgeon (R.A.G.) between 2005 and 2008 were reviewed. Canthoplasty was performed through a minimally invasive upper eyelid crease approach. Concomitant surgical procedures were recorded. Patients without digital preoperative and postoperative photographs for review were excluded.

Preoperative and postoperative photographs at the longest follow-up visit were analyzed and graded for functional and cosmetic outcomes. All photographs were obtained using a standardized technique in the frontal position with the eyelids open and facial muscles relaxed. The technique of using photographs for comparison of eyelid position measurements has been established in previous studies.²⁸ Complications were recorded.

Surgical Technique. Surgeries were performed under monitored anesthesia care along with local injection of lidocaine 2% with epinephrine. A limited lateral (Fig. 1) or standard upper eyelid crease incision (Fig. 2) was performed. The latter was performed if the patient was undergoing concomitant upper eyelid blepharoplasty. Through the lateral extent of the incision, blunt and sharp dissection, using Stevens scissors, exposed the lateral canthal tendon and orbital rim. With one tip of the scissors in the orbit and the other outside, the lateral canthal tendon fibers were dissected from their periosteal attachments. The Eisler's fat pad was preserved if possible. At this point, the lower eyelid lateral fat pocket was exposed and debulked as indicated. To shorten the tarsus in cases of horizontal laxity, the lateral lower eyelid tarsus was trimmed using an en-glove mincing technique. Finally, a double armed, absorbable suture (4-0 Maxon on CV-23 needle) was used to reattach the lateral canthus to the Whitnall's tubercle inside the orbital rim, at the appropriate vertical height. The 2 needles were both passed through the same spot in the lateral aspect of the lower eyelid tarsus at the gray line (Fig. 1G–H). By passing one needle through the lower half of the tarsus and the other needle more superficial through the upper tarsus, a loop was created that engaged substantial tarsal tissue. With appropriate (not excessive) tension on the lower eyelid, the suture was

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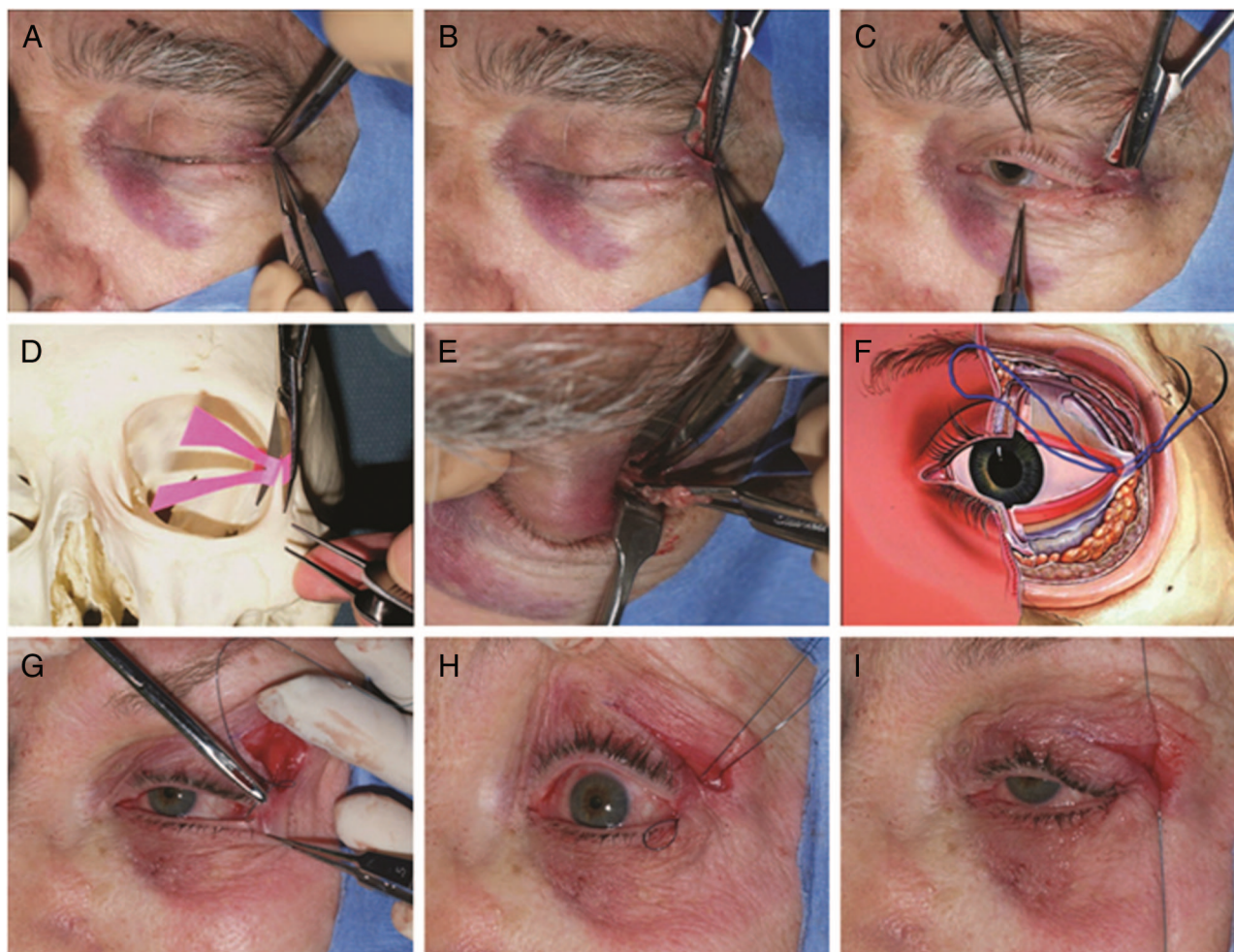


FIG. 1. Intraoperative photograph series demonstrating lateral canthoplasty through a small upper eyelid crease incision. **A**, Small incision in upper eyelid crease; **B**, sharp and blunt dissection to expose the lateral canthal tendon; **C**, severing of the lateral canthal tendon; **D**, skull view showing release of the tendon (opposite side) using Stevens scissors with one blade in the orbit and other outside of the orbit; **E**, optional debulking of lateral lower eyelid fat pad through same incision; **F**, schematic diagram showing placement of the double armed suture through the lateral edge of lower eyelid tarsus (opposite side) and resuspension to the Whitnall's tubercle (permission obtained from Dr. Bruce Stewart, as published in *Orbital Surgery—A Conceptual Approach*, 1995, p 134); **G** and **H**, placement of double armed suture through the lateral edge of lower eyelid tarsus; and **I**, lower eyelid and lateral canthus position just after suture tied.

then tied and the knot tucked below the orbicularis of the lateral eyelid crease incision.

RESULTS

Total of 600 patients (1,050 eyelids) underwent successful lateral canthoplasty through a small incision in the upper eyelid crease and resuspension technique, with quick recovery. Indications included lower eyelid malposition (laxity, ectropion, entropion) and/or lateral canthal dystopia, encompassing 806 reconstructive and 244 cosmetic lateral canthoplasties. Minimum follow-up time was 3 months (mean, 6 months; maximum, 6 years). There were 260 males and 340 females, with mean age of 55 years (range, 4–92 years). Sixty-four patients had prior history of failed lateral canthoplasty.

Concomitant surgical procedures performed included upper eyelid blepharoplasty, lower eyelid blepharoplasty (through the same upper eyelid incision or transconjunctival), and lower eyelid retractor reinsertion, among others. Photographs were analyzed for lower eyelid position and lateral canthal position. Moreover, the lower eyelid ten-

sion was assessed postoperatively. Representative cases are shown in Figures 3–5.

We found no complications of lower eyelid retraction, ectropion, entropion, hematoma, infection, or untoward external scarring. Complications were rare and minor, including transient postoperative chemosis lasting up to 2 weeks (28 cases), suture granulomas (8 cases), and minor infections. There was one case of retrobulbar hematoma, requiring only conservative management. Although all showed improved in eyelid position (as assessed clinically and on photographs), 18 patients underwent reoperation in the following 2 years for recurrent lower eyelid malposition and/or lateral canthal deformity.

DISCUSSION

Lateral canthoplasty is a core procedure to restore eyelid function and to correct lower eyelid malposition. It has become an important part of cosmetic blepharoplasty. As the aging process progresses, there is decreasing tonicity of the lower

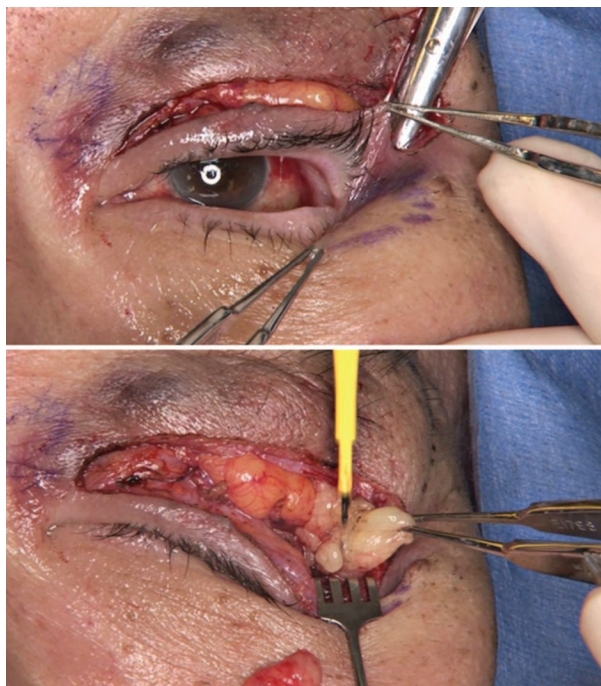


FIG. 2. Intraoperative photograph showing the lateral canthoplasty being performed through the lateral aspect of a standard upper blepharoplasty incision (top). Note that the lateral lower eyelid fat pocket is being debulked through the same incision (bottom).

eyelid, especially the lateral canthal tendon.²³ This produces lower eyelid laxity, descent of the lateral canthus, and an inferior migration of the lower eyelid.

Many different surgical procedures are available that are related to or affect the position of the lateral canthus, including lateral tarsal strip, the inferior reticular lateral canthoplasty,



FIG. 3. Preoperative (top) and 6-month postoperative (bottom) photographs of a 60-year-old female who underwent bilateral lateral canthoplasty and lateral lower eyelid fat pocket removal through a small upper eyelid crease incision.

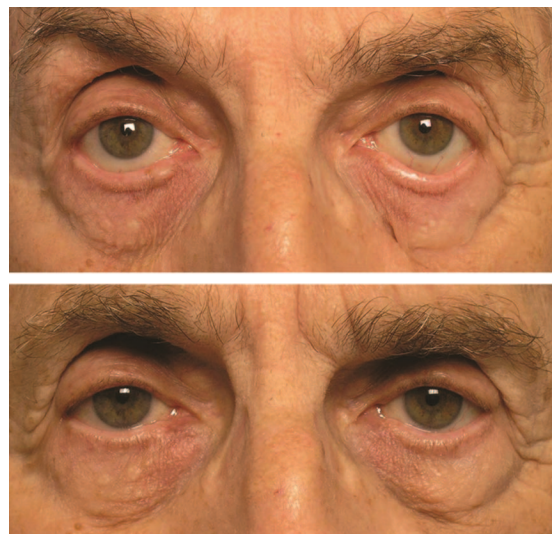


FIG. 4. Preoperative (top) and 6-month postoperative (bottom) photographs of a 67-year-old male who underwent bilateral lateral canthoplasty.

dermal orbicular pennant, the lateral reticular suspension, transposition of the lateral canthal tendon, and fascial slings to the lower eyelid.^{1,3-27} The evolution of surgical techniques has been driven by unsatisfactory postoperative results. The traditional method is the lateral tarsal strip.

The lateral tarsal strip canthoplasty is accomplished with an open exposure of the canthal tendon. However, the open canthal incision has potential disadvantages. The disarticulation of the upper eyelid/tendon from the lower eyelid/tendon can lead to length disparity between the upper and lower tendons, misalignment of the mucosal or cutaneous elements of the canthal junction, and scarring or web formation in the multicontoured mucocutaneous region (Fig. 6). Rounding of the canthal angle can also occur if the reconstruction is under undue tension or if too much tarsus is removed. Furthermore,



FIG. 5. Preoperative (top) and 6-month postoperative (bottom) photographs of a 58-year-old female who underwent bilateral lateral canthoplasty, along with bilateral upper blepharoplasty and blepharoptosis surgery.

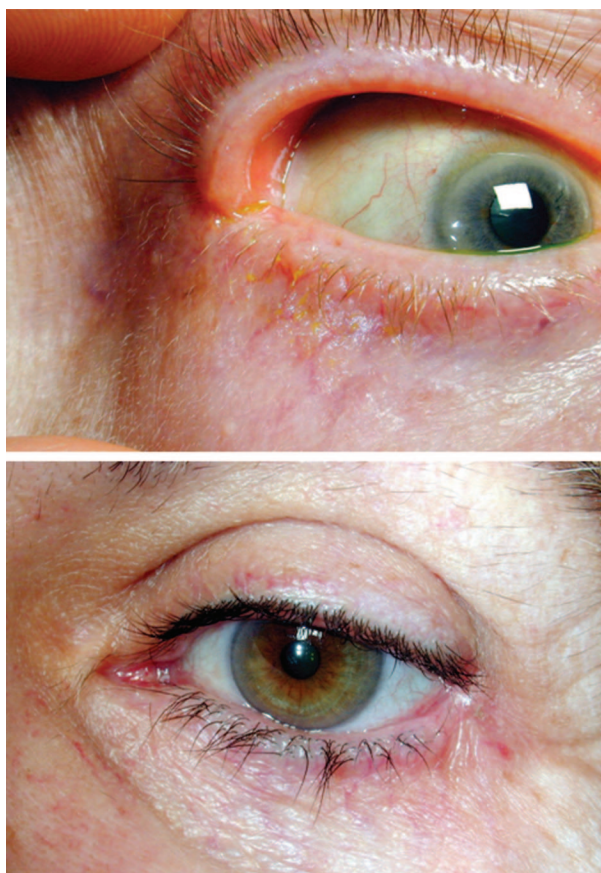


FIG. 6. The traditional lateral tarsal strip can result in length disparity between the upper and lower tendons with misalignment of the mucosal or cutaneous elements of the canthal junction (top) and scarring or web formation in the multicolored mucocutaneous region (bottom).

the horizontal incision at that location can compromise the lymphatic drainage of the upper and lower eyelids and weaken the orbicularis oculi muscle. The latter is especially critical in those patients needing to undergo lateral canthoplasty to correct an already paralytic ectropion.

In our series of 1,050 lateral canthoplasties over the past 4 years, we have had excellent functional and aesthetic results using our minimally invasive upper eyelid crease incision approach and resuspension technique for lateral canthoplasty. Because the anatomy of the mucocutaneous lateral canthal angle is not violated, there is decreased risk of significant postoperative lymphedema, misalignment of the upper and lower tendons, and scarring or web formation. It can be performed concurrent with upper blepharoplasty without additional incisions.

Our technique has some similarities to other reported techniques¹⁶; however, there are differences. We avoid any other cutaneous incisions other than the upper eyelid crease incision. Furthermore, by disinserting and exposing the common tendon, we can shorten the lateral tarsus, if necessary. Because the suture engages portions of the common tendon, the upper and lower limbs are both tightened, decreasing the tendency for length disparity or “overhanging” of the upper eyelid.

Only limited shortening (mincing) of the tarsal tendon can be accomplished through the closed approach. When more severe horizontal laxity is present, requiring significant hori-

zontal shortening of the tarsus, then the traditional open lateral tarsal strip procedure is preferred. It should be remembered that canthal anchoring, no matter how well performed, will not be effective or long-lasting if under excessive tension or if orbicularis oculi paralysis is present. Moreover, lower eyelid displacement away from the globe may occur if the vector of fixation is not internal and placed well inside the orbital rim, particularly if there is inadequate mobile skin and middle lamella in the canthal area.

In summary, a minimally invasive upper eyelid crease incision approach and resuspension technique can efficiently and aesthetically reconstruct the lateral canthus. It can be used in both reconstructive and cosmetic cases. Avoiding the open canthal incision decreases the risk of scarring or malposition of the mucocutaneous junction, decreases the tendency for length disparity, and better protects the lymphatic drainage and orbicularis oculi muscle. It may be combined with other procedures, if necessary. The lateral eyelid crease incision provides access, for example, to the middle lamella of the lower eyelid in en-glove fashion and to the lateral lower eyelid fat pad. Knowledge of the anatomic relationship between the upper eyelid, lower eyelid, lateral canthus, and orbit is important to avoid unnecessary damage and achieve the optimal result. Of course, biologic and physiologic factors at play need to be considered in every case.

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