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MINI-LIFT LOWER-LID BLEPHAROPLASTY: A SAFE APPROACH TO REJUVENATION

Chedly Bouzouaya discusses the mini-lift approach to blepharoplasty surgery, which avoids the complications associated with traditional transcutaneous approaches

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ABSTRACT
Rejuvenation of the lower eyelid often requires tightening of excess skin and removal or transposition of orbital fat. Although transcutaneous lower-lid blepharoplasty accomplishes these aesthetic demands, it has been associated with an increased risk of lower-lid malposition rates of up to 20%. The mini-lift technique allows the surgeon to sculpt the orbital fat prolapse and address excess skin, avoiding the traditional complications of transcutaneous lower-lid blepharoplasty, such as scleral show, rounded lateral canthus, and ectropion.

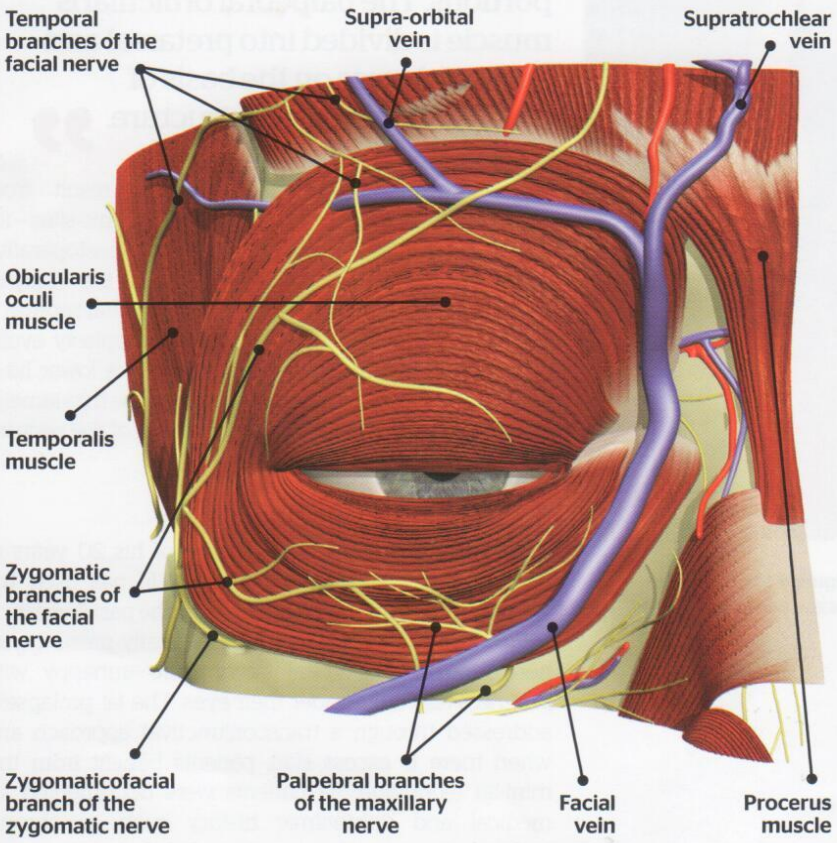
KEYWORDS
blepharoplasty, mini-lift, anatomy, rejuvenation, lower eyelid

COSMETIC EYELID SURGERY HAS THE BENEFIT OF 2000 years of development and refinement of surgical techniques and instruments. Ali Ibn Isa (AD 940-1010) first described the procedure more than 1000 years ago[1,2]. Aulus Cornelius Celsus, the first century Roman encyclopaedist and philosopher, was likely the first to comment on the excision of skin of the upper eyelids when he described the treatment of the 'relaxed eyelid' in *De re Medica*[3], which was published only in 1478 following its rediscovery by Pope Nicholas V.

The term 'blepharoplasty' (from the Greek words blepharon, 'eyelid', and plassein, 'to form') was originally used by Von Graefe in 1818 to describe a case of eyelid reconstruction that he had performed in 1809[4]. In the 1913 edition of the American Encyclopedia of Ophthalmology, blepharoplasty is defined as the reformation, replacement, readjustment or transplantation of any of the eyelid tissues[5]. Now, blepharoplasty refers to the excision of excessive eyelid skin, with or without the excision of orbital fat, for either functional or cosmetic indications. These cosmetic indications have been recognised by physicians only since the turn of the last century, but are now the most common reason for such ▷

> "Blepharoplasty refers to the excision of excessive eyelid skin, with or without the excision of orbital fat, for either functional or cosmetic indications"

Figure 1 Periorbital anatomy showing muscles, veins and nerves



▷ surgery on the lower eyelids. This change followed the development of improved techniques, better surgical results, and control of sepsis, as well as the change in social attitudes.

> "Historically, the transcutaneous approach has been the surgical technique of choice, but often resulting in lower-lid ectropion, noticeable scarring, and lower-lid retraction."

Modern transcutaneous blepharoplasty was first described by Castañares in 1951[6], when an incision was made 1-2mm below the eyelash line, allowing access to the orbicularis oculi muscle through a skin flap technique. This technique resulted in complications such as ectropion and a lateral rounding of the lower eyelid, but the procedure gradually evolved into the use of a skin muscle flap to allow access to the intraorbital fat.

McCollough and English[7] further evolved the technique to a skin flap or skin muscle flap, in which the incision is placed inferiorly to the tarsal margin, thus allowing a 'cuff' of the pretarsal orbicularis oculi muscle to remain undisturbed. However, this technique is now rarely used.

Historically, the transcutaneous approach has been the surgical technique of choice, but often resulting in lower-lid ectropion, noticeable scarring, and lower-lid retraction, the latter being the most common and dreaded complication. The transconjunctival technique was first described in 1924 by Julien Bourquet. This approach was popularised by Tessier[8], who used the conjunctival approach to the orbital floor and maxilla in congenital malformation and trauma.

Anatomy

The lower eyelid is divided into an anterior lamella, being the skin and orbicularis, and a posterior lamella, being tarsus and conjunctiva. The tarsus of the lower lid is as long as the upper tarsus, but is only 4-5mm wide at the centre of the lid. The tarsus has a number of meibomian glands with orifices on the ciliary border.

The capsulopalpebral fascia in the lower lid is analogous to the levator aponeurosis of the upper lid. It originates from attachments to the terminal muscle fibres of the inferior rectus muscle. It divides as it encircles the inferior oblique muscle then joins to form Lockwood's suspensory ligament. The capsulopalpebral fascia inserts into the inferior tarsal border and stands to the inferior conjunctival fornix, the suspensory ligament of the fornix.

The orbital septum—a multilayered thin sheet of fibrous tissue—arises from the perioteum over the inferior orbital rim. The orbital septum fuses with the capsulopalpebral fascia at or below the inferior tarsal border. It is the septum that divides the eyelid into anterior and posterior lamella. The anatomic significance of the septum orbitale is that it keeps the orbital fat in its posterior location. In transconjunctival blepharoplasty, the entrance into the orbital fat is made posterior to the ▷

Figure 2 The concept of the mini-lift technique

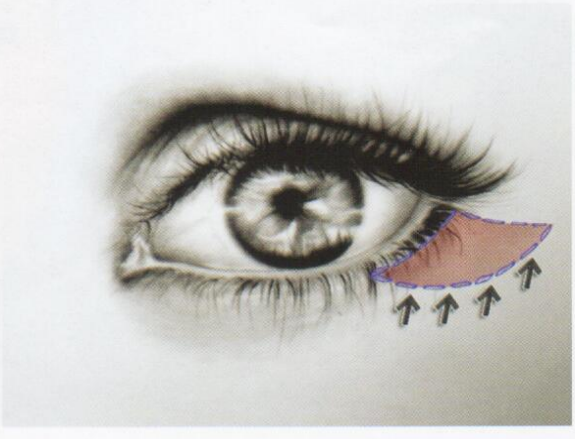


Figure 3 Drawing of the resected skin

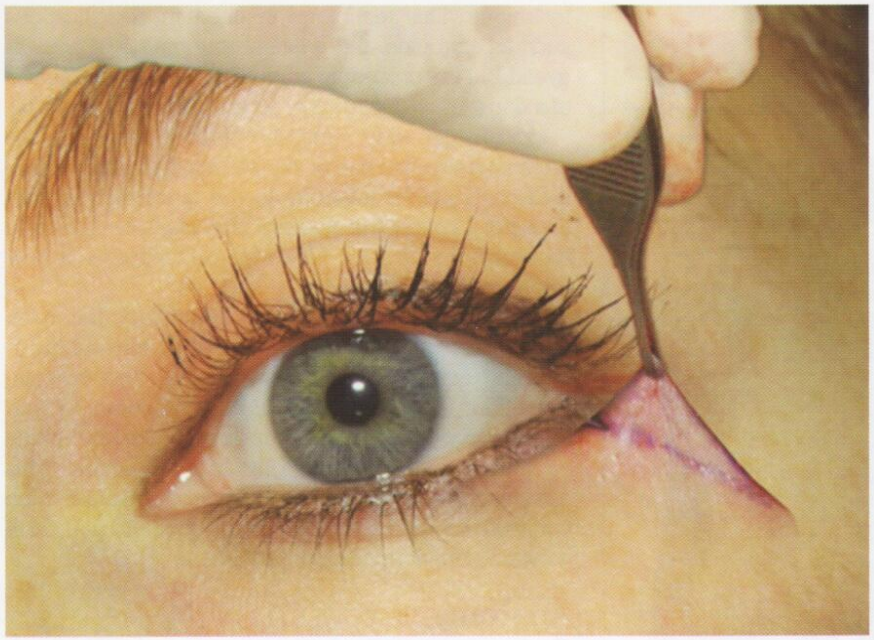


Figure 4 Marking of the excess skin to be resected

▷ orbital septum. Therefore, the anterior lamella is not disturbed.

The orbicularis muscle is divided arbitrarily into orbital and palpebral portions. The palpebral orbicularis muscle is divided into pretarsal and preseptal parts on the basis of underlying anatomic structure. There are voluntary and involuntary actions to the palpebral part of orbicularis muscle, and involuntary action to the orbital part.

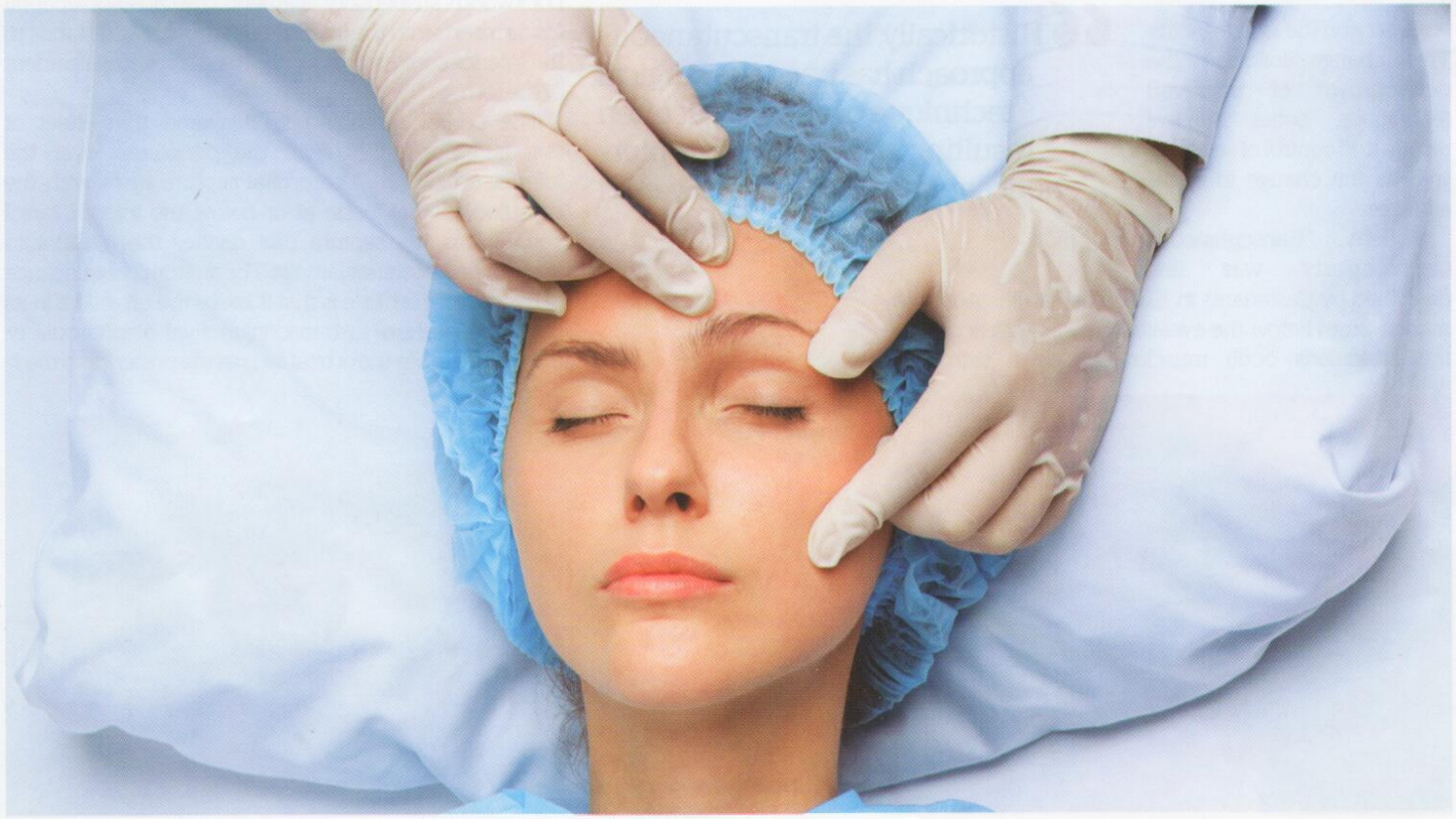
Retraction may occur even if skin resection is conservative, as the retraction may result from pathological changes at a number of anatomic sites—for example, vertical shortening of the skin, postoperative scarring, contracture of tissue—but in the author's experience scarring in the plane of the orbital septum is the most common cause of post-blepharoplasty eyelid retraction. When an upward traction of the lower lid is applied, it is difficult to spot a tethering of the mid-lamella. This is evidence of scarring in the plane of the septum, without evidence of skin shortage.

"The orbicularis muscle is divided arbitrarily into orbital and palpebral portions. The palpebral orbicularis muscle is divided into pretarsal and preseptal parts on the basis of underlying anatomic structure."

Surgical technique

The author reviewed the outcome of his 20 years of blepharoplasty surgery experience. He has used the technique described in this article for the past 5 years.

Candidates for blepharoplasty typically present with herniation of the orbital fat and are unhappy with puffiness and bags under their eyes. The fat prolapse is addressed through a transconjunctival approach and when there is excess skin, patients benefit from this mini-lift technique. All patients were documented for medical and ophthalmic history such as chronic systemic disease and medications. Ophthalmic history ▷



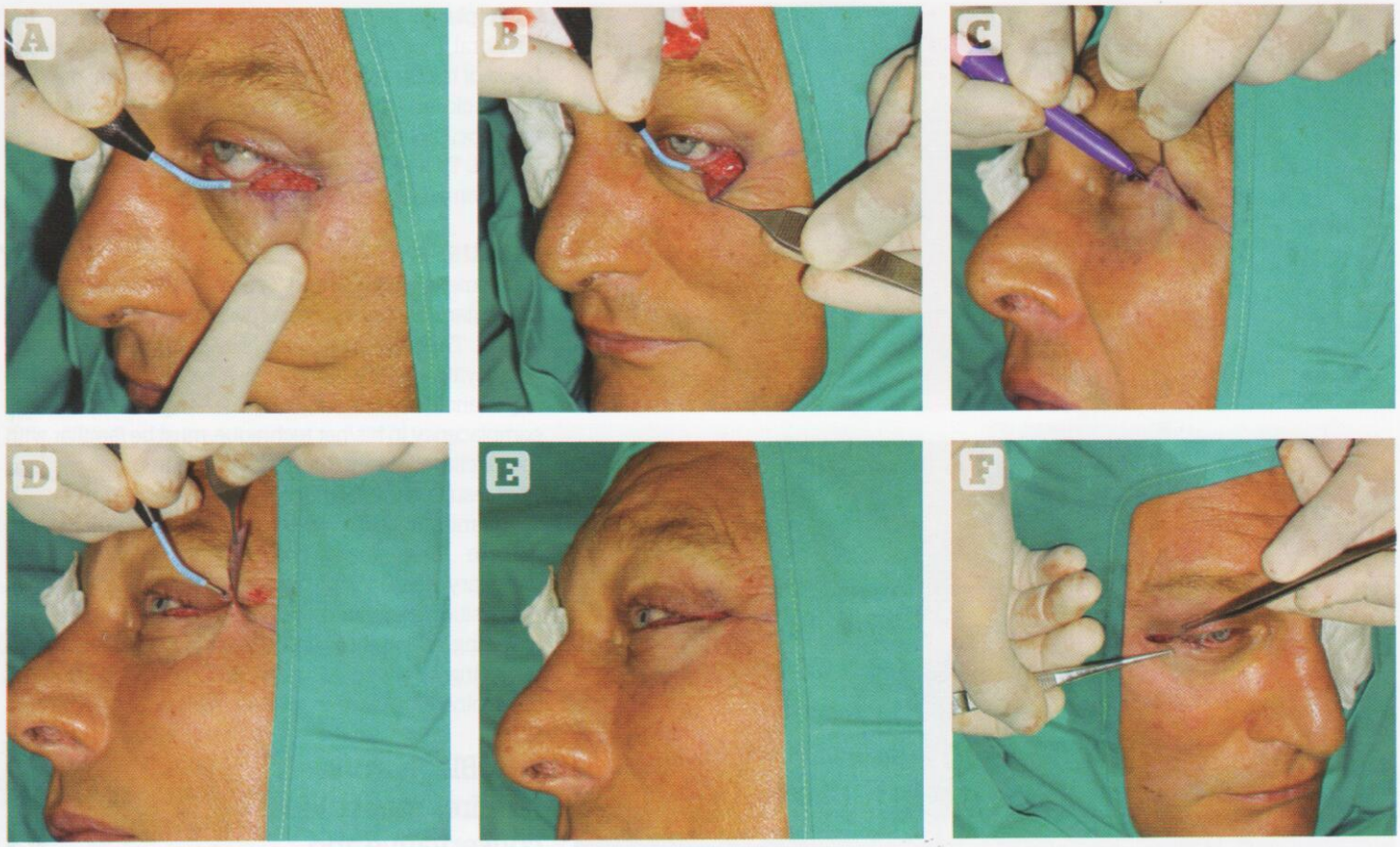


Figure 5 (A) Skin incision along the marked line. (B) Skin and orbicularis are undermined. (C) Skin-muscle flap draped upward and laterally. (D) Skin excision. (E) Nice fitting all along the skin incision without excess skin. (F) Supporting 6-0 PROLENE sutures. (G) Skin closed with interrupted sutures.

▷ included vision, glaucoma, trauma, allergic reactions, excess tearing, and dry eyes. In addition to a complete eye examination, evaluation of the periorbital area should consider skin laxity or excess, orbicularis laxity or hypertrophy, herniation of the orbital fat, canthal laxity, malar festoons, and rhytides. Patients with prior blepharoplasty or mid-facelift surgery were excluded.

The surgery begins by marking the incision line, 2-3mm below the lid margin in the lateral third of the lower lid, extending to 2mm beyond the lateral canthal angle. The line continues laterally and downward in a pre-existing laugh crease for a distance of 10-15mm depending on the amount of skin to be excised (*Figure 2*).

Anaesthesia is performed by infiltration of the fornix with 2-3ml of 2% lidocaine with 1:100 000 adrenaline. Surgery begins with the skin incision using radiofrequency (RF), blade or CO_2 laser. The orbital fat prolapse is sculpted through a transconjunctival approach[9,10], a lid plate is placed to protect the globe and help the orbital fat to herniate. The fornix is exposed and an incision through the conjunctiva and retractors is made at the lower border of the tarsal plate. Using RF instrumentation, an incision is made in a classic fashion from the punctum to the lateral canthal angle, or with a more conservative mini-incision technique, in which the incisions are made at the medial, central and lateral fat pads (if a lateral fat prolapse has been assessed preoperatively). These button-hole incisions avoid a total disinsertion of the lower-lid retractor and a better assessment of fat to be removed with the use of a Chedly Lid Retractor. The lower lid is retracted on its full length, allowing a nice exposure of the whole surgical field of fat prolapse, and allowing a good visualisation of any bleeding. This dual lid retractor is insulated with a non-reflective finish and is safe to use with a radiosurgical unit or CO_2 laser[11,12].

With an incision at the lower border of the tarsus, there is no need for sutures[13]. Once the fat prolapse has been sculpted and resected as described, attention is turned to resect the excess skin using the mini-lift technique. The skin and orbicularis are undermined, and the skin muscle flap is draped upward and laterally over the eyelid incision line with slight tension. The patient is asked to look upward to estimate the amount of vertical skin to be resected. Care must be taken not to remove more skin than necessary. Rarely will more than 4-5mm of vertical skin need to be excised. Scissors can be used to cut the excess skin muscle flap.

One (or two) deep supporting 6-0 PROLENE sutures ▷

"Anaesthesia is performed by infiltration of the fornix with 2-3ml of 2% lidocaine with 1:100 000 adrenaline. Surgery begins with the skin incision using radiofrequency (RF), blade or CO_2 laser."

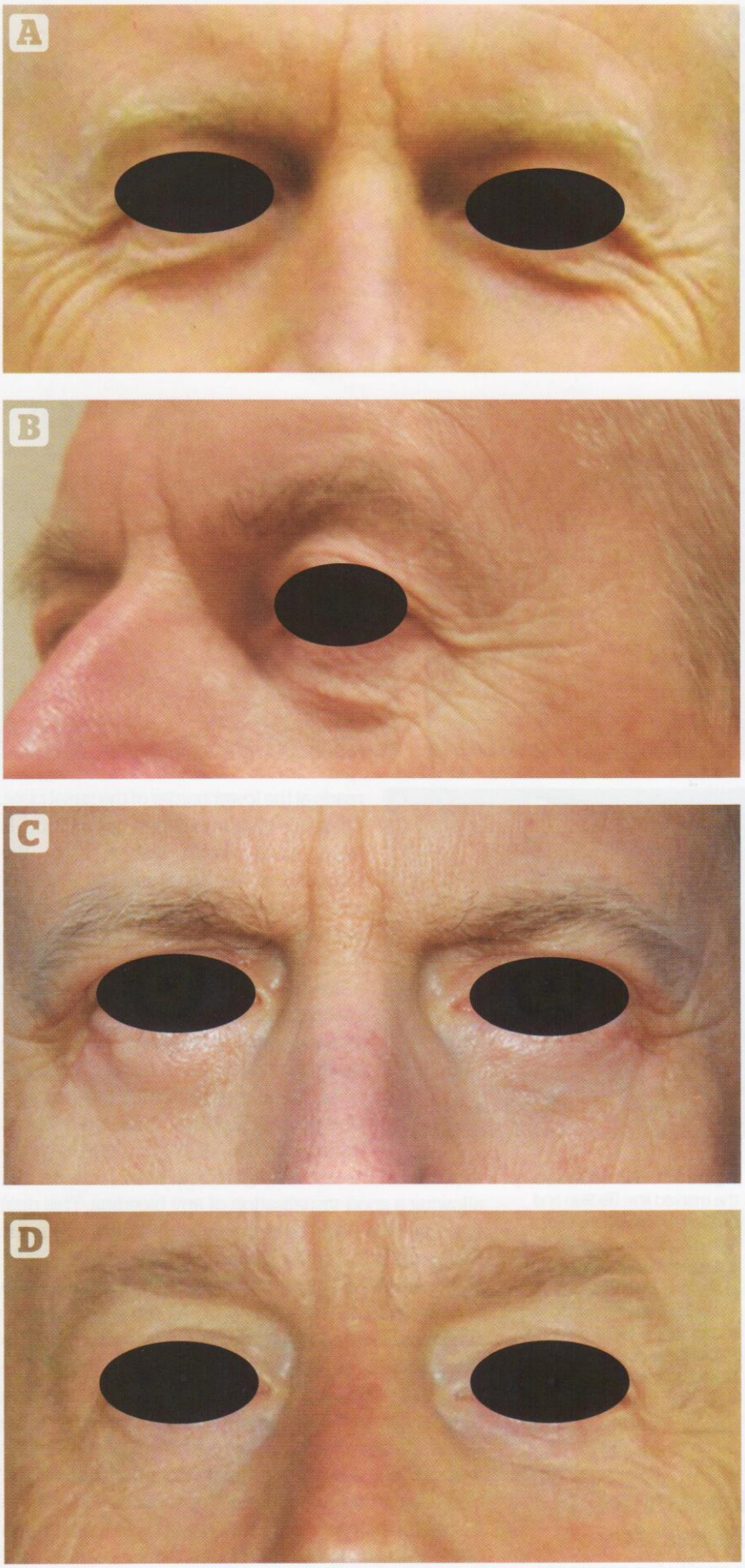


Figure 6 (A) and (B) before mini-lift blepharoplasty treatment. (C) 3 weeks postoperatively and (D) 3 years postoperatively

▷ are placed through the orbicularis muscle of the temporal flap edge and into the deep subcutaneous fascia of the upper skin incision over the orbital rim. The skin is closed with interrupted 6-0 nylon sutures along the subciliary incision and the temporal portion of the wound. This technique often allows the reduction of a lymphomatous festoon, if present.

Discussion

In cosmetic surgery, and cosmetic eyelid surgery in particular, the surgeon must reach excellency in his/her results. Therefore, blepharoplasty requires meticulous, conservative and minimally-invasive techniques by an experienced eyelid surgeon. The surgeon must avoid complacency in his/her technique, must be familiar with the eyelid anatomy, thus avoiding complications and poor results, and allowing the patient a fast recovery.

The mini-lift technique to remove excess skin helps to achieve these goals. The standard and traditional subciliary incision has a number of drawbacks. Lower-lid malposition, including lower-lid retraction, lateral canthal rounding, scleral show and ectropion are complications, occurring at a rate of up to 20%. Lower-lid laxity as determined by excess anterior distraction of the lid, prolonged snap-back testing, a negative vector relationship, and prominence of the globe, are all preoperative risk factors and in the opinion of many authors, definitive indications for lateral cathal tightening[14-16].

> **"Blepharoplasty requires meticulous, conservative and minimally-invasive techniques by an experienced eyelid surgeon."**

These complications may occur even if skin resection is conservative as the retraction may result from pathologic changes at a number of anatomic sites, including vertical shortening of the skin on the total length of the lower lid, postoperative scarring, and contracture of tissue. In the author's experience, however, scarring in the plane of the orbital septum is the most common cause of post-blepharoplasty eyelid retraction. When an upward traction of the lower lid is applied, a tethering of the mid-lamella can be seen, which is evidence of scarring in the plane of the septum, without evidence of skin shortage.

Therefore, while lid retraction may be owing to mid-lamellar scarring, ectropion and retraction may also be the result of too much skin excision and of not tightening a loose canthus. This should be diagnosed preoperatively.

The surgical manipulation of the orbicularis oculi in the traditional transcutaneous technique leads to its denervation and secondarily, to lower eyelid malposition, although these claims have not been substantied in comparative studies[17-19].

The resection of the orbital fat prolapse transconjunctivally in this mini-lift technique keeps the septum unharmed, therefore avoiding complications ▷

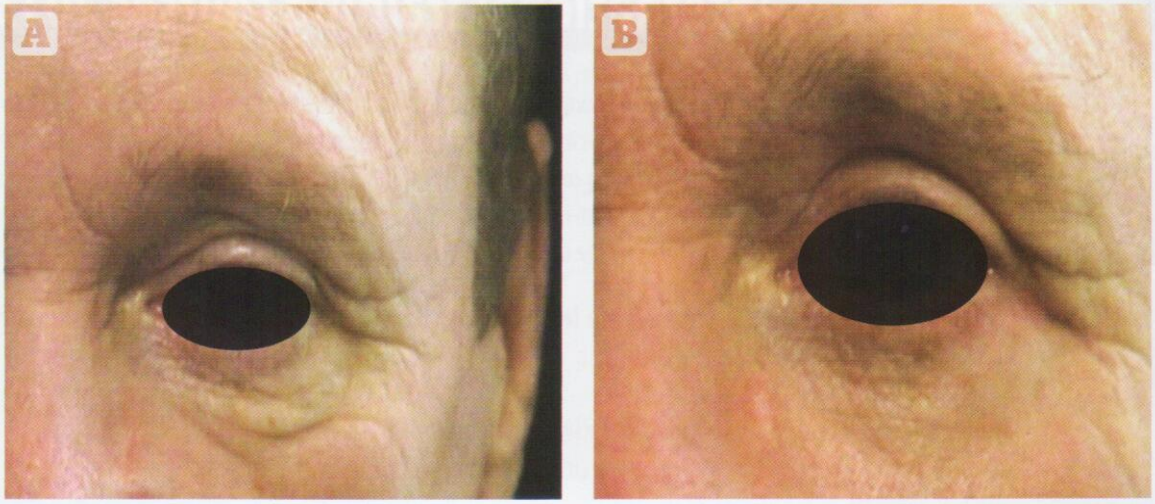
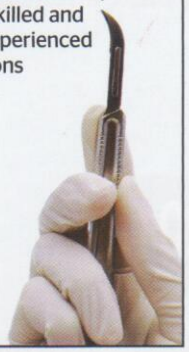


Figure 7 Close-up view (A) before and (B) after mini-lift blepharoplasty

Key points

- Blepharoplasty requires meticulous, conservative and minimally-invasive techniques
- The mini-lift technique helps avoid the complications of the traditional subciliary incision and shortens the recovery time
- This is a simple and efficient technique, easy to execute by both skilled and less experienced surgeons



▷ related to septum opening in the traditional transcutaneous technique. With the mini-lift technique, there is no temporary orbicularis dystonia and no need for a formal canthoplasty. The orbicularis suspension described in this surgical technique elevates the lower eyelid to a natural and anatomically appropriate position. The resuspension of the ptotic orbicularis muscle also reinforces the underlying attenuated orbital septum, which was kept intact by addressing orbital fat prolapse via a transconjunctival approach.

The mini-lift technique helps the facial plastic surgeon to avoid the complications of the traditional transcutaneous approach and helps shorten the recovery time with minimal oedema and chemosis. Lower-lid malposition following blepharoplasty has led plastic surgeons to improve techniques into less-invasive and versatile approaches[20-22].

> "Lower-lid malposition following blepharoplasty has led plastic surgeons to improve techniques into less-invasive and versatile approaches."

Conclusions

Blepharoplasty remains one of the most gratifying surgeries in facial plastic surgery, but there is no tolerance for error and complications. Good patient selection, a thorough evaluation of the deformity, the choice of the proper minimally-invasive technique, and a precise and accurate execution of the surgical procedure are key to obtaining optimal results. The mini-lift lower-eyelid blepharoplasty gives very good results, is a simple and efficient technique, and is easy to execute by skilled surgeons, but also by those with less experience.

▶ ***Declaration of interest*** *Dr Bouzouaya has no direct financial or any other interest in the products mentioned in the article, nor is he a paid consultant for any of the companies mentioned*

▶ ***Figure images 1*** *© Primal Pictures, www.primalpictures.com;* ***2-7*** *© Dr Bouzouaya*

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