

# Bipolar Coagulation-Assisted Orbital (BICO) Septoblepharoplasty

## *A Retrospective Analysis of a New Fat-Saving Upper-Eyelid Blepharoplasty Technique*

Berend van der Lei, MD, PhD,\*<sup>‡</sup> Irene S. Krabbe Timmerman, MD,\* Michel Cromheecke, MD, PhD,\* and Stefan O. P. Hofer, MD, PhD<sup>†</sup>

**Background:** Upper eyelid blepharoplasty generally is performed as a combination of excess skin reduction and fat resection. Fat resection can in the long term result in a hollow orbit. Therefore, treatment of the lax orbital septum, in combination with skin reduction, seems a more preferable approach than fat resection.

The authors describe a technique of upper-eyelid blepharoplasty: a combination of excess skin reduction and shortening of the stretched lax orbital septum by means of bipolar coagulation. This procedure is called *bipolar coagulation-assisted orbital septoblepharoplasty*, ie, BICO septoblepharoplasty. The aim of this retrospective study is to report on our initial experience with this technique.

**Methods:** We retrospectively analyzed 296 patients in whom an upper-eyelid blepharoplasty was performed during the past 4 years using the BICO septoblepharoplasty technique: first, excess skin is removed, then a small rim of orbicularis muscle is excised to expose the bulging orbital septum, and finally, before closure of the wound, bipolar coagulation of the exposed orbital septum is performed. This results in shrinkage of the septum and thus in repositioning of the pseudoherniated fat pads.

**Results:** At discharge from follow-up, which varied from 9 weeks (72% of the patients) up till 2 years after surgery (28% of the patients), in all patients ultimately a satisfactory result was achieved and ultimately all were satisfied or very satisfied with the result of the procedure. There were only 3 patients with minor complications: 1 patient with a slightly retracting scar, which resolved spontaneously, and 2 patients with slight asymmetry requiring additional skin resection.

**Conclusions:** BICO septoblepharoplasty of the upper eyelid seems to be an effective way to treat blepharochalasia of the upper eyelid; the

bipolar coagulation of the orbital septum will lead to shrinkage of the septum, thereby repositioning the prolapsing medial and central fat pads. Secondary fibrosis will reinforce the orbital septum postoperatively.

**Key Words:** blepharoplasty, fat-saving, upper eyelid, new technique, bipolar coagulation

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Upper-eyelid blepharoplasty is one of the most frequently performed plastic surgical procedures for functional and esthetic purposes. In general, basic upper-eyelid blepharoplasty is performed as a combination of excess skin reduction and fat resection. There is increasing evidence, however, that fat should not routinely be removed in a blepharoplasty procedure, because in time, periorbital and intraorbital fat atrophy will occur. This causes signs of aging, such as hollowing of the eyes, and gives an increasingly tired look. Treatment of the lax orbital septum, which causes bulging of fat in the upper eyelid, seems a more logical approach than fat resection.

Several authors have described their experience with orbital fat-saving blepharoplasty procedures, especially of the lower lid.<sup>1–4</sup> Having experience with some of these fat-saving techniques for lower-eyelid blepharoplasty, in 2002, the senior author (B.v.d.L.) started to use a new fat-saving technique of upper-eyelid blepharoplasty: a combination of excess skin reduction and shorting of the stretched lax orbital septum by means of bipolar coagulation. This procedure is called *bipolar coagulation-assisted orbital (BICO) septoblepharoplasty*, ie, BICO septoblepharoplasty. This BICO septoblepharoplasty has been performed in a consecutive series of 296 patients over the past 4 years and is currently still the method of choice for upper-eyelid blepharoplasty. The anatomic basis, the (simplicity of the) technique, and our initial results as evaluated retrospectively from the patient charts and the pre- and post operative photographs are presented.

### Anatomic Consideration

Fat protects the globe within the bony cone of the orbit. This fat is held in place anteriorly by the orbital septum and the orbicularis muscle, both in the upper, as well as the lower,

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From the \*Department of Plastic, Reconstructive, Aesthetic and Hand Surgery, Medical Centre of Leeuwarden, and Private Clinic Heerenveen, The Netherlands; the †Department of Plastic and Reconstructive Surgery, Erasmus Medical Center, Rotterdam, The Netherlands; and the ‡University Medical Centre of Groningen, The Netherlands.

Reprints: Berend van der Lei, MD, PhD, Department of Plastic, Reconstructive, Aesthetic and Hand Surgery, Medical Centre of Leeuwarden, Henri Dunantweg 2, Leeuwarden, Friesland 8934 AD, The Netherlands. E-mail: heslei@planet.nl.

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eyelid. In the upper eyelid, weakening of the orbital septum will lead to prolapse of the intraorbital fat, giving the upper eyelid a too full and heavy appearance.<sup>5,6</sup> Our purpose was to create a simple technique that can be used in upper-eyelid blepharoplasty to reinforce the orbital septum, thereby preserving the fat and keeping a more youthful appearance of the eye, ie, adequate fullness of the upper eyelid. Bipolar coagulation will give shrinkage of the orbital septum, which results in the immediate desired disappearance of bulging of fat; the diathermal injury will also lead to fibrosis and thereby thickening and tightening of the orbital septum.

### PATIENTS AND METHODS

#### Patients

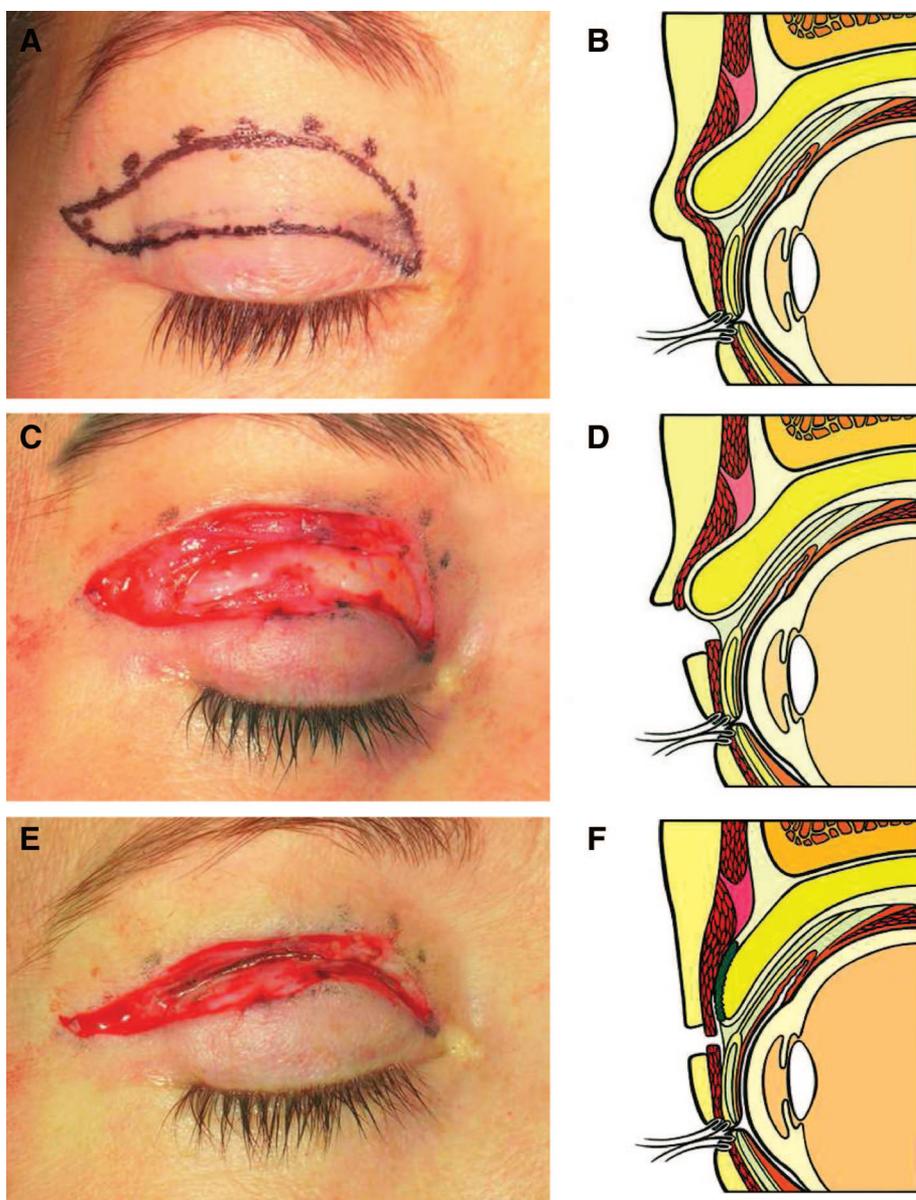
A total of 296 patients underwent bilateral upper-eyelid BICO septoblepharoplasty over a 4-year period between 2002

and 2006 and were retrospectively analyzed using their medical charts, including pre- and postoperative photographs. The group consisted of 248 women (mean age, 53.7 + 10.1 years; median, 53.5 years) and 48 men (56 + 11.0 years; median, 55 years).

#### Operative Technique

##### Skin Marking

The design of the incision lines is marked with a waterproof pencil (Fig. 1A). The crease demarcation is usually slightly beneath or at the upper eyelid crease at about 7 to 9 mm above the upper lid margin centrally. Medially, it starts at the level of the lacrimal punctum. Laterally, the extension depends on the presence of lateral hooding. The upper incision line is planned by projecting the hooding skin over the demarcated crease, with the patient in a supine position to avoid overresection. Skin resection should be conservative. The pinch technique



**FIGURE 1.** A–F, Schematic drawing of the BICO septoblepharoplasty technique. A, Preoperative marking of the lines of incision. B, Schematic drawing depicting the preoperative situation with bulging of the subseptal orbital fat. C, Intraoperative situation after skin excision and removal of a small rim of preseptal orbicularis muscle: note the bulging/pseudoherniation of the subseptal fat compartments. D, Schematic drawing depicting the intraoperative situation after skin excision and removal of a small rim of preseptal orbicularis muscle. E, Intraoperative situation after bipolar coagulation of the orbital septum; note the disappearance of the bulging subseptal fat and that the gap in the orbicularis muscle almost has closed. F, Schematic drawing depicting the intraoperative situation after bipolar coagulation of the orbital septum.

is finally applied; this test should not evert the lash margin. The planning is in such a way that the ultimate scar is just in the upper eyelid crease and extends laterally into the line of the crow's-feet (Fig. 1A, B).

### Anesthesia

The operation is usually performed under local anesthesia. Disinfection is performed with aquas chlorhexidine (0.5%; Frisian Hospital Pharmacy, Leeuwarden, The Netherlands). Next, infiltration of the skin is performed with lidocaine 2% with 1:100,000 epinephrine (Astra Zeneca B.V., Zoetermeer, The Netherlands).

### Skin Incision and Septal Approach

After incision of the skin with a blade, the skin and subcutaneous layer are removed with scissors. Next, a very small rim of preseptal orbicularis muscle is removed, after which the orbital septum is exposed (Fig. 1C, D). Especially at the medial side, the orbital septum has to be exposed by spreading with scissors: the central subseptal fat compartment is mostly without scissor dissection clearly visible as it tends to bulge. Meticulous hemostasis is then performed using bipolar coagulation.

### Orbital Septum Correction

Bipolar coagulation of the overlying clearly exposed septum is performed, resulting in shrinkage and disappearance of the bulging subseptal fat compartments (Fig. 1E, F). This form of "hernia repair" of the orbital septum is then tested by gentle pressure on the globe. Thereafter, if necessary, ancillary procedures, such as suturing of the subcutaneous brow tissue to the arcus marginalis in case of slight brow ptosis or other cosmetic procedures, can be performed.

In case of ptosis palpebrae, first the orbital septum is opened to expose the levator complex; after levator suspension, the orbital septum is "repaired" by gripping both ends of the opened septum between the bipolar pincet and then "welding" both edges of the opened septum by bipolar coagulation. Also in this case, repair is checked by gentle pressure on the globe.

### Wound Closure

The gap in the orbicularis muscle closes automatically after bipolar coagulation of the orbital septum (Fig. 1E). Finally, the wound is closed centrally with a running intracutaneous pullout suture and laterally with single tied sutures,

both Ethilon 6-0 (Ethicon, Sint Stevens-Woluwe, Belgium), after which cooling packs are applied. After 5 to 7 days, all sutures are removed.

## RESULTS

### Intraoperative Findings

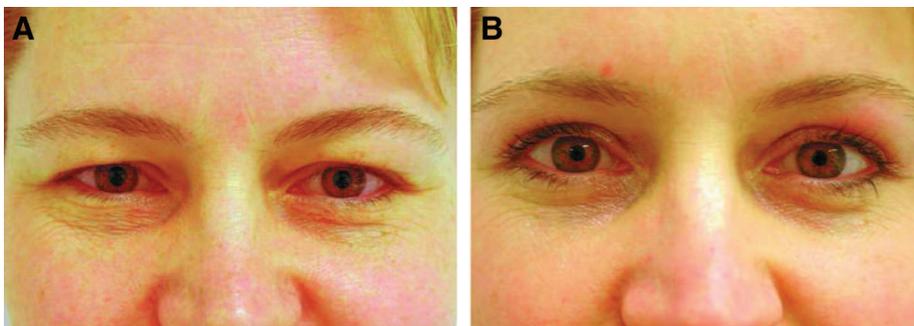
In all cases the orbital septum was approached without any problems. The orbicularis muscle was easily separated from the orbital septum. There was no herniation of fat pads through the orbital septum or orbicularis muscle in any patient, but in most instances there was a certain amount of septal laxity, which allowed for fat bulging. The magnitude of fat-pad bulging was different and inconsistent in both compartments.

### Surgical Outcome

Bipolar coagulation of the orbital septum without removal of fat from the medial and central subseptal fat compartments has been performed in 296 subsequent patients. These patients have been followed for different time intervals, varying from 9 weeks up till 2 years. Typically, patients returned at days 5 to 7 postsurgery for suture removal and 8 weeks later for evaluation of the end result, after which follow-up was stopped (in 212 of the 296 patients, ie, 72%). For patients that had an additional esthetic procedure (eg, a short-scar facelift, neck lift, lower-eyelid blepharoplasty [n = 80]) or that had complications (n = 3), follow-up appointments were up till 24 months postsurgery (83 of the 296 patients, ie, 28%). There were no major complications in this series. Minor complications consisted of 1 patient with a slightly retracting scar, which resolved spontaneously, and 2 patients with slight asymmetry requiring additional skin resection after 6 months. Ultimately, at discharge from follow-up, all patients were satisfied or very satisfied with the result of the procedure. Analyzing the pre- and postoperative photographs in all cases at the end of follow-up showed a clearly visible improvement of the upper-eyelid contour (see Figs. 2–4: examples of patients 6 till 12 months after BICO septoblepharoplasty).

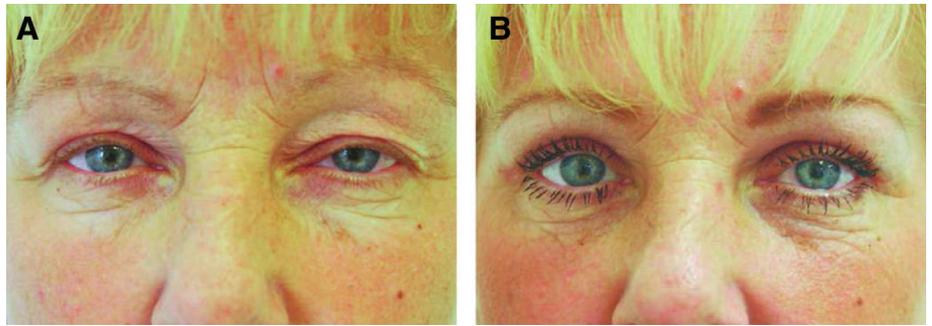
## DISCUSSION

The aim of this study was to describe our initial experience with the BICO septoblepharoplasty technique for upper eyelids. This technique has been used by the senior author since November 2002 after having noticed discussion

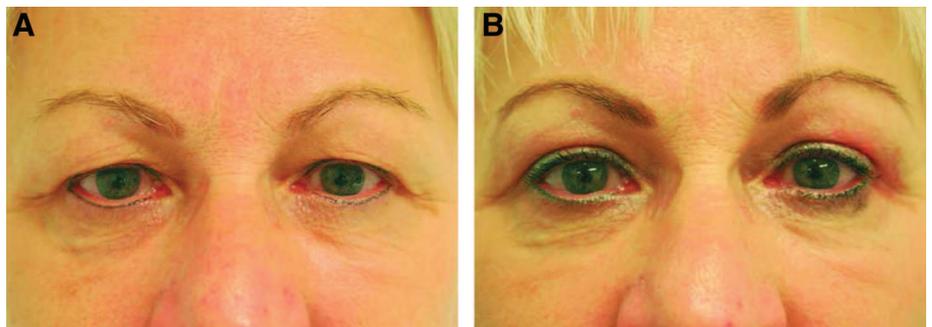


**FIGURE 2.** A, B, A 37-year-old woman before (A) and 6 months after (B) BICO septoblepharoplasty of the upper eyelids. In this patient, minor brow ptosis on the right site was corrected by internal fixation of the orbicularis muscle to the superior orbital rim.

**FIGURE 3.** A, B, A 50-year-old woman before (A) and 12 months after (B) BICO septoblepharoplasty of the upper eyelids. In this patient, ptosis palpebrae of her left eye was corrected in the same procedure.



**FIGURE 4.** A, B, A 62-year-old woman before (A) and 6 months after (B) BICO septoblepharoplasty of the upper eyelids. Note the natural appearance.



in literature and during scientific meetings concerning the ongoing trend to remove less fat from the eyelids. At the same time, he observed in some earlier cases that coagulation of the orbital septum resulted in equally good results than after removal of orbital fat.

With aging, there are 2 problems that cause the typical stigmatizing sign of aging: first, herniation of the fat pads in the medial and central compartments due to, eg, weakening of the orbital septum, atrophy of the orbicularis muscle, and slackness of the skin. Also hereditary and constitutional factors, as well as systemic causes such as, eg, kidney disease or diabetes, may play a role. Second, with aging fat tends to atrophy, thereby resulting in the skeletonization of the face, which reflects aging.

Many plastic surgeons still remove fat from the medial and central compartment when performing an upper-eyelid blepharoplasty. Fortunately, there is a clear trend to remove less fat, since aggressive fat removal may lead to hollowing of the upper eyelid. Good results of the concept of a fat-saving septoplasty procedure in upper-lid blepharoplasties have been highlighted by nondiathermal techniques before.<sup>7,8</sup>

Cook et al<sup>9</sup> described already in 1984 in the ophthalmologic literature the approach of light electrocautery to the orbital septum of the lower eyelids, causing thus shrinkage and tightening of the orbital septum. They reported for a series of 364 cases of lower eyelids that the desired improvement was achieved with no complications. Bissacia et al<sup>10</sup> reported in the dermatologic literature in 1990 a similar technique in the treatment of lower-eyelid fat pads in a series of 30 consecutive patients with good results. Choo and Rathbun<sup>11</sup> reported in 2003 in a large series of both upper- and lower-blepharoplasty patients (almost 1500) the application of a grid of electrocautery to the orbital septum to treat

the pseudoherniation of the orbital septum with success; none of their patients, with a follow-up of at least 3 months and a follow-up ranging from 3 months to 20 years, had postoperative eyelid retraction. Very recently, Prado et al<sup>12</sup> demonstrated in a prospective comparative study the efficiency of a grid spray of electrocautery as compared with CO<sub>2</sub> laser as a treatment modality of the lax septum orbitale in both upper- and lower-eyelid blepharoplasty.

The disadvantage of all these types of monopolar electrocautery of the orbital septum can be a certain amount of thermal effect which extends deep down in the fat pads and which may thereby may compromise lid fat volume. Monopolar electrocautery may cause pain behind the eye during electrocautery, as we have experienced in the past when we removed fat with monopolar cautery. In our opinion, bipolar electrocautery will deliver its energy and heat to the septum orbitale more precisely and can be used to “weld” the edges of an opened orbital septum in case of levator suspension.

Fagien<sup>13</sup> reported on advanced rejuvenative upper blepharoplasty in his landmark paper in 2002. He pointed out that we should actually treat and see the upper periorbita and not just remove fat but rejuvenate the upper eyelid by repositioning herniated or descended fat. He treated bulging of the orbital septum with the overlying orbicularis oculi muscle (which he does not remove) by applying cautery to the lower wound edge of the upper-eyelid incision to enhance the transorbicular scar. This should promote a lower-positioned upper-eyelid crease and smoother pretarsal soft-tissue draping. We think that just removing a very small rim of orbicularis muscle with more direct bipolar electrocautery to the lax orbital septum may give a better shrinkage and durable effect on the pseudoherniated fat pads. Moreover, this does

not harm the orbicularis muscle; the small gap automatically closes after the bipolar coagulation of the orbital septum.

This retrospective study indicates that the BICO septoblepharoplasty technique for upper eyelids seems to be an effective way to treat blepharochalasia of the upper eyelid: instead of fat removal, as with the classic blepharoplasty technique, the bipolar coagulation of the orbital septum will lead to shrinkage of the orbital septum, thereby repositioning the prolapsing medial and central fat pads and/or consolidating the orbital septum by secondary fibrosis. Long-term and prospective studies are warranted to elucidate the longevity of the BICO septoblepharoplasty technique for upper eyelids.

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