

**Brow Lifting: Operative Techniques using Transblepharoplasty
Approach with Internal Fixation Device**

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Introduction:

Brow elevation through a blepharoplasty incision can be accomplished by internal fixation with the Endotine TransBleph™ (Coapt Systems, Inc) device. The surgical method and modifications developed over the authors' first 100 consecutive patients are presented.

Incision Placement: Standard Upper Eyelid Blepharoplasty

1. Place inferior limb of incision in lid crease
2. Manually elevate brow when planning upper limb of incision to accommodate the effect that the new brow position will have on the lids, thereby avoiding lagophthalmos -OR-
3. Postpone placement of upper limb of incision until after the brow has been positioned
4. Carry incision past lateral orbit to facilitate dissection of periosteum over lateral orbital rim. The brow will thus be more free for elevation



Anesthesia:

1. Inject with or without monitored sedation
2. Infiltrate lid with local of choice (e.g. 2-3 ml of 2% lidocaine with 1:100,000 epi mixed 50:50 with bupivacaine 0.75%; hyaluronidase may be added)
3. Block supraorbital and supra-orbital nerves transcutaneously with 2-3 ml of same local on each side
4. Add more anesthesia during procedure as necessary



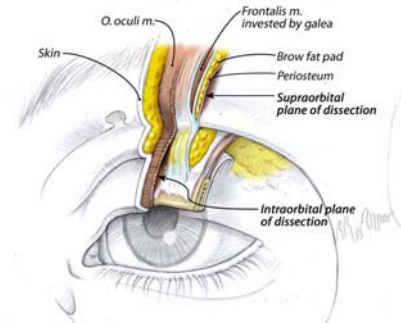
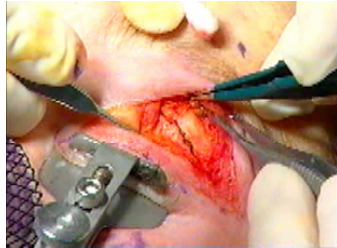
Blepharoplasty Dissection:

1. Perform blepharoplasty of choice
2. Dissect in preseptal-suborbicularis plane superiorly to orbital rim and about 1/2 cm beyond
3. Avoid division of septum to prevent creation of septal flap that might become imbricated in brow dissection
4. If preaponeurotic fat removal is considered desirable, do so through small button-hole septal incisions
5. Maintain optimal hemostasis through preferred technique



Periosteum Division:

1. Mark supraorbital notch and begin incision in periosteum lateral to notch. Incision can be made with a sharp elevator, blade or laser
2. Continue incision across the orbital rim within a centimeter above arcus marginalis. Extend it laterally past frontozygomatic suture to lateral canthus
3. Watch for unexpected emissary or perforating vessels which might bleed when dividing periosteum. Bone wax may be needed



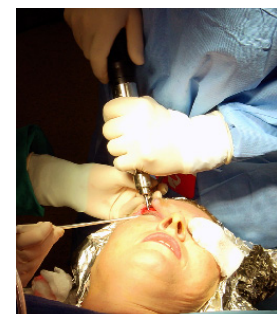
Periosteum Elevation:

1. Stay lateral to supraorbital notch to avoid those structures
2. Use periosteal elevator of choice (e.g. freer)
3. Carry central subperiosteal dissection as far superiorly as desired to take advantage of potential lift provided by frontal-occipital elevators
4. Divide conjoint fascia under direct observation for 1.5 cm above orbital rim
5. Hug bone with elevator to avoid frontal branch of facial nerve when doing this
6. Carry dissection temporally and stay on deep temporal-parietal fascia to avoid frontal nerve



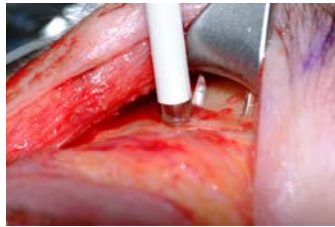
Prepare Osteotomy:

1. Mark desired osteotomy site at 12-15 mm superior to orbital rim in a vertical line from lateral limbus with eye at distance fixation
2. Retract and protect brow flap with Desmarres or Senn retractor
3. Keep drill bit perpendicular to plane of frontal bone to facilitate snug fit of fixation device
4. Use manual or low speed drill to avoid drill bit chatter which can inadvertently enlarge osteotomy
5. Clean osteotomy of bone fragments which might prevent seating of device flush with frontal bone



Device Placement:

1. Place device with firm pressure into osteotomy. Should be a tight fit
2. Elevate brow flap to desired level with marked superior traction (over-corrections have NOT been a problem)
3. Drive flap with vigorous external pressure onto device to impale both the periosteum and galea -OR-
4. Alternatively, the periosteum and galea can be suspended above the prongs or sutured to it



Closure and Postoperative Care:

1. Close bleph incision with preferred technique
2. If patient has hyperactive brow, botulinum toxin may be injected pre-op or intra-op to relax brow and thereby potentiate fixation
3. Oral antibiotics as preferred, perhaps indicated if perforation of frontal sinus occurs



Results:

This technique produced satisfactory results in all patients. No intraoperative complications occurred. Hemostasis should be controlled as per usual. Avoidance of the frontal branch of the facial nerve is important as with any brow lift. Avoidance of the supraorbital and supratrochlear neurovascular complex is also prudent. Postoperatively, one patient had persistent vague, forehead pain but good elevation of brows. After 8 weeks, the Endotines were removed and the pain resolved.

Advantages:

Minimal learning curve
Short operation time
Familiar approach and anatomy
No Endoscopy required

Disadvantages

Cost of device
Cost of instrumentation
Difficult to address glabellar depressor muscles with ablation or myotomy if desired

Conclusions:

Transblepharoplasty brow elevation can be safely, effectively, and reproducibly performed with the Endotine device.

Author Discloser:

Dr. Baker is on the medical advisory board for Coapt Systems, Inc. He has received consulting fees, travel assistance, and stock options. Dr. Holck and Dr. Holloman have no financial interest.