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Figure 1.1 Standard version photographs showing the eyes in nine positions of gaze.

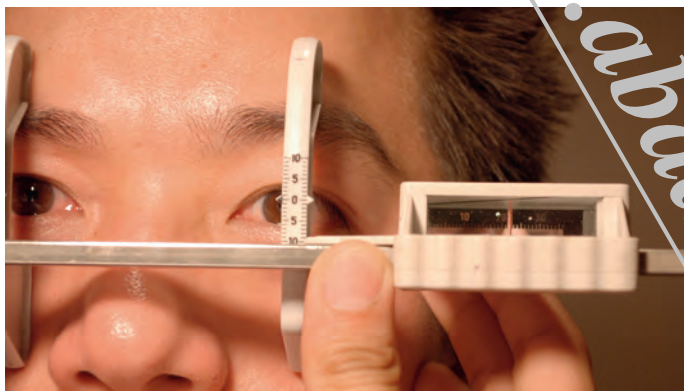


Figure 1.2 Globe position as measured using a Naugle exophthalmometer.

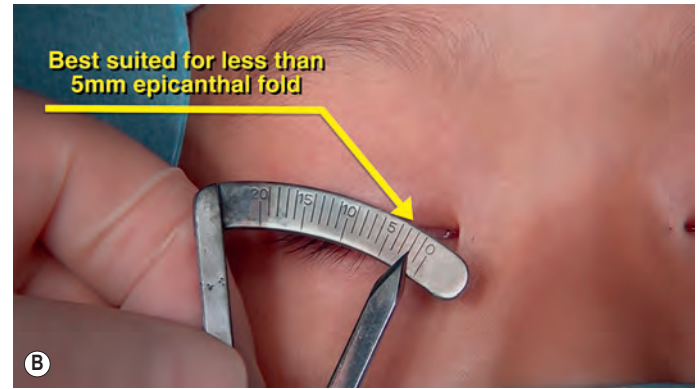
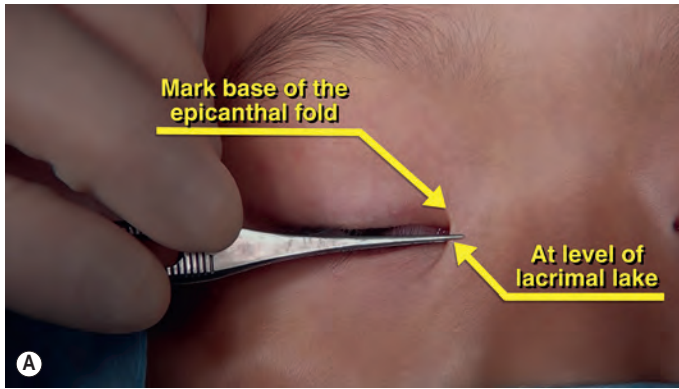


Figure 1.3 Worm's eye view in a patient with thyroid-related orbitopathy.

Figure 1.4 Worm's eye view of a patient gently closing her eyelids with lagophthalmos on the right side.

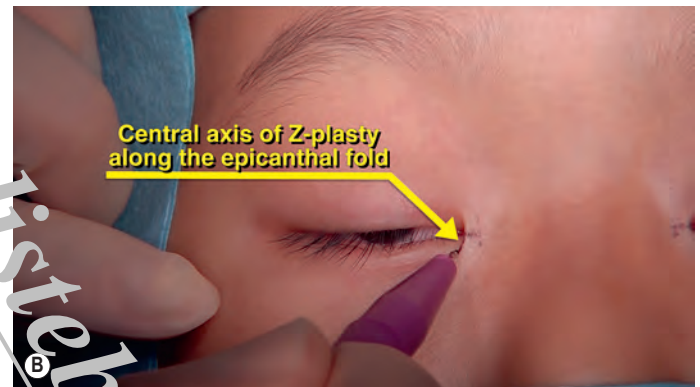


SURGICAL TECHNIQUE



Figures 7.1A and 7.1B Marking the base of the epicanthal fold

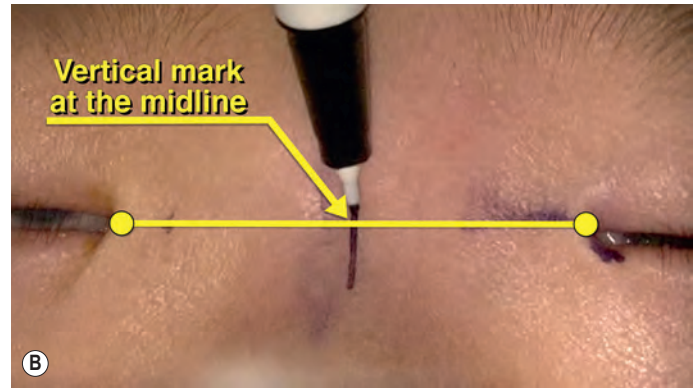
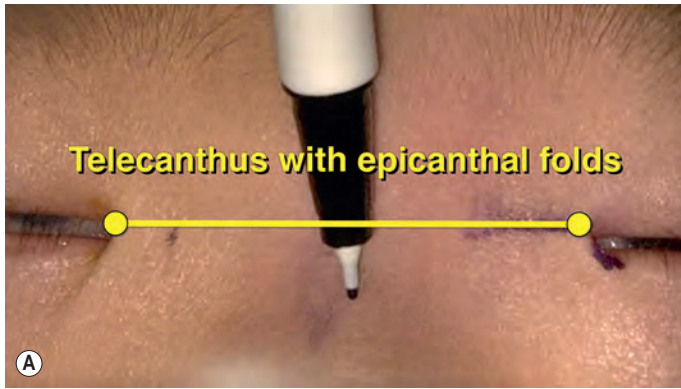
All markings are performed prior to infiltration of local anesthesia. If the skin is oily, an alcohol prep should be used to clean the skin surface. A topical anesthetic such as proparacaine can be given prior to cleansing of the skin surface and marking to reduce discomfort. Toothless forceps are used to first mark the base of the epicanthal fold to be addressed at the level of the lacrimal lake (Figure 7.1A). This is compared to the fellow eyelid and measured. In general the root Z-epicanthoplasty is ideally suited for reduction of less than a 5 mm epicanthal fold (Figure 7.1B).



Figures 7.2A–D Marking of root Z-epicanthoplasty

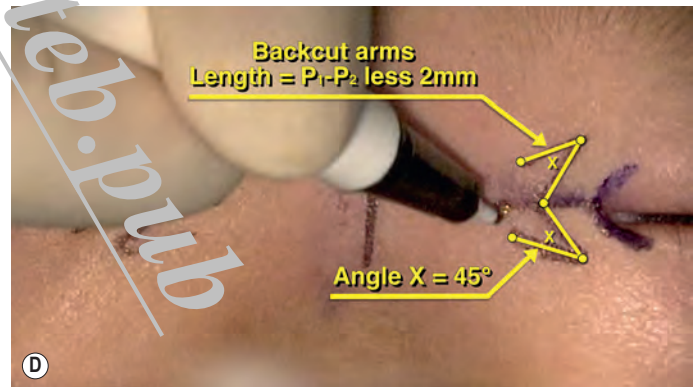
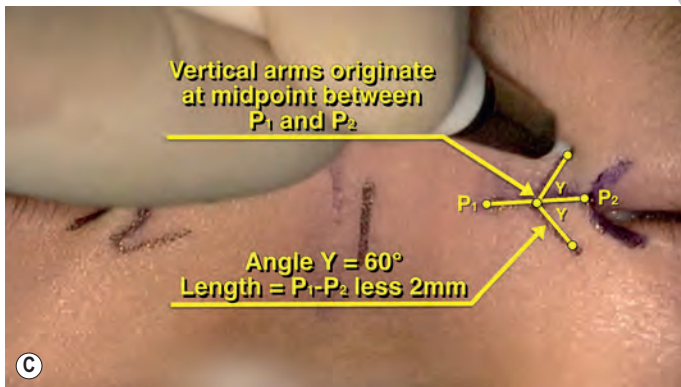
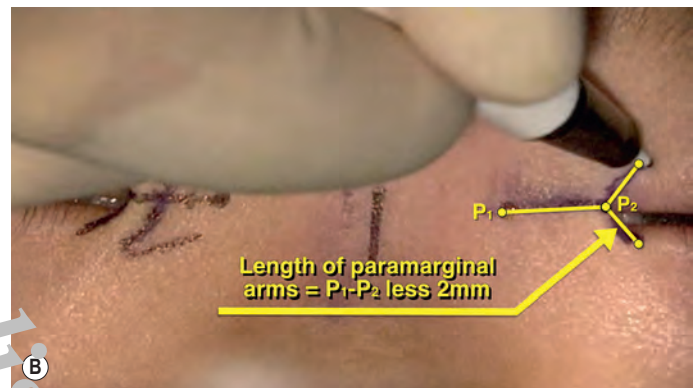
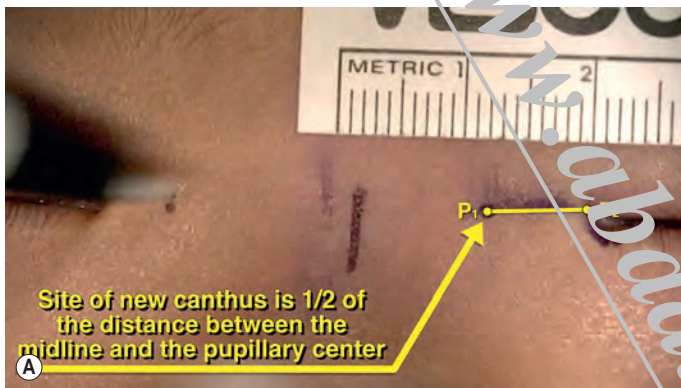
A horizontal mark is first made towards the lacrimal lake from the base of the epicanthal fold and terminating at the lateral extent of the epicanthal fold (Figure 7.2A). Next, the central axis of the Z-plasty is marked inferiorly along the epicanthal fold (Figure 7.2B). With the epicanthal fold distracted medially, the central axis can be seen (Figure 7.2C) and then the final marking is made superiorly towards the lacrimal lake (Figure 7.2D). Excessive ink from the pen should be blotted with a gauze pad to minimize diffusion of the marking. Note that the superior extent of the mark towards the lacrimal lake is in line with the horizontal marking and that the length of each limb of the Z-plasty is the same.

SURGICAL TECHNIQUE



Figures 8.1A and 8.1B Marking of the midline

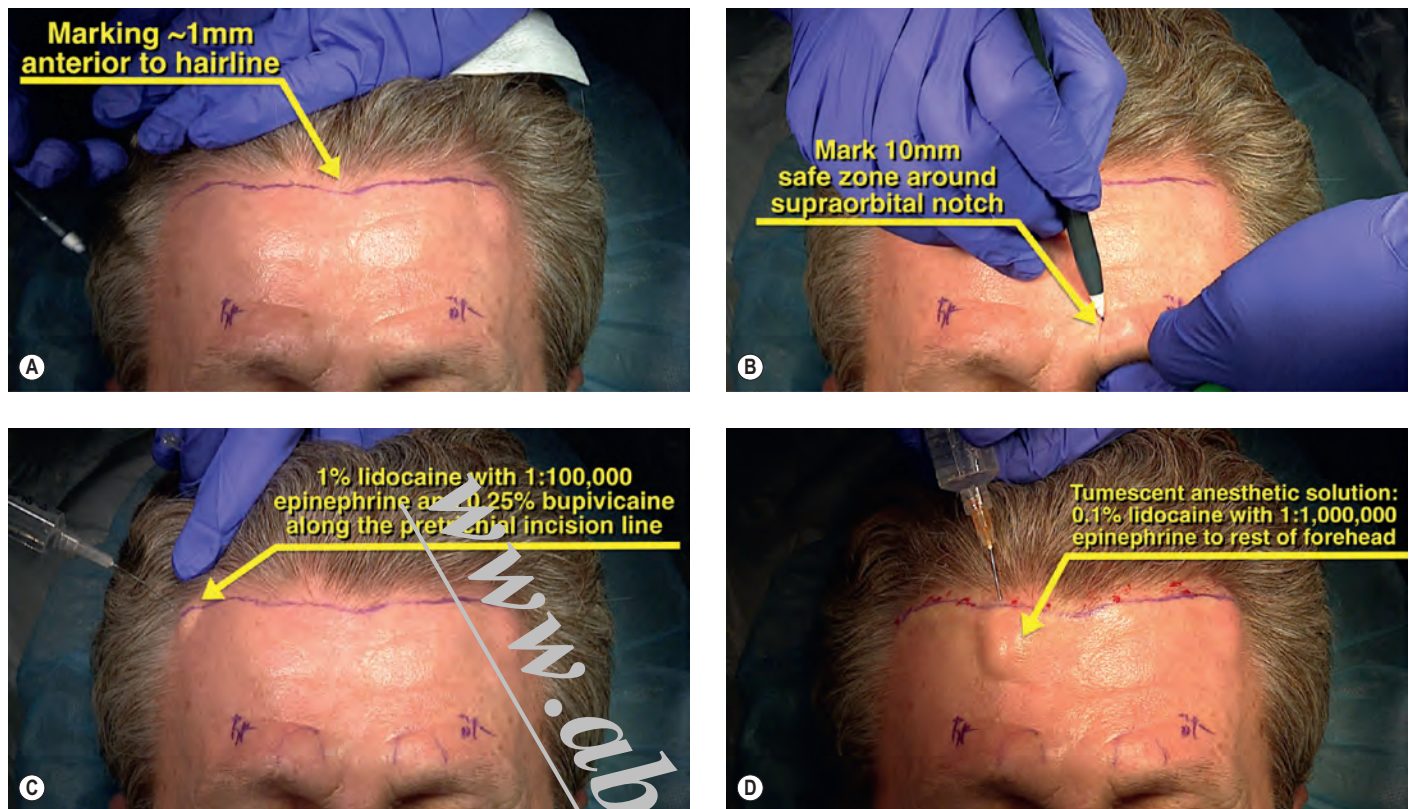
This is a patient with blepharophimosis syndrome with congenital epicanthal inversus associated with moderate telecanthus (Figure 8.1A). A vertical mark is made at the patient's midline (Figure 8.1B).



Figures 8.2A–E Marking of flap

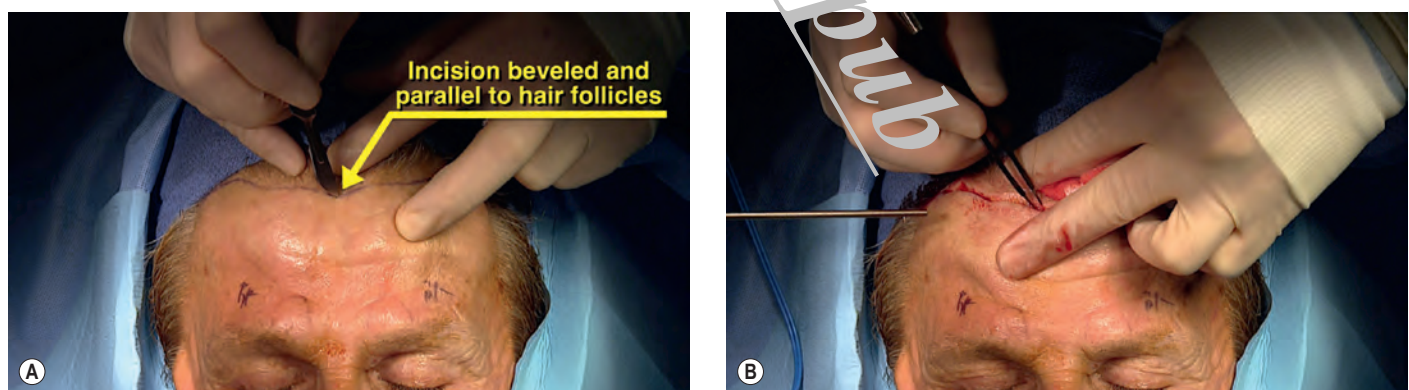
The desired site (P₁) of the new medial canthus is marked at one-half the distance between the midline and the pupillary center (Figure 8.2A). This distance is best measured with the patient looking in the distance without convergence. The mark is made in line with both pupils. A horizontal line is then drawn from P₁ to the original canthus P₂. The paramarginal eyelid arms are then marked for a distance of 2 mm less than the length of (P₁ - P₂) (Figure 8.2B). Next, the vertical arms are marked, starting at the midpoint between (P₁ - P₂), and this subtends a 60° angle with the P₂ arm (Figure 8.2C). The length of these vertical arms is also (P₁ - P₂) - 2 mm. Finally, the backcut arms are marked with the same arm length as the others but the angle subtended is 45° (Figure 8.2D).

SURGICAL TECHNIQUE



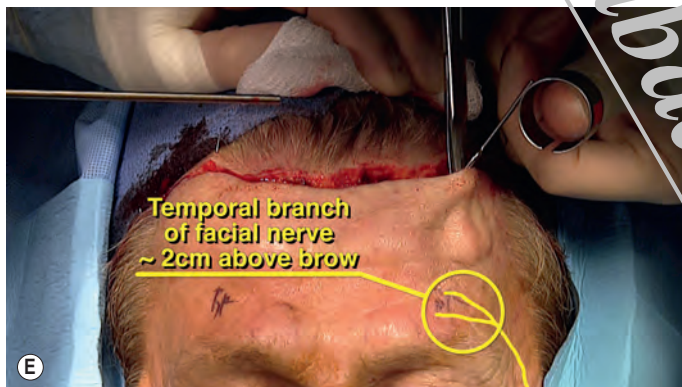
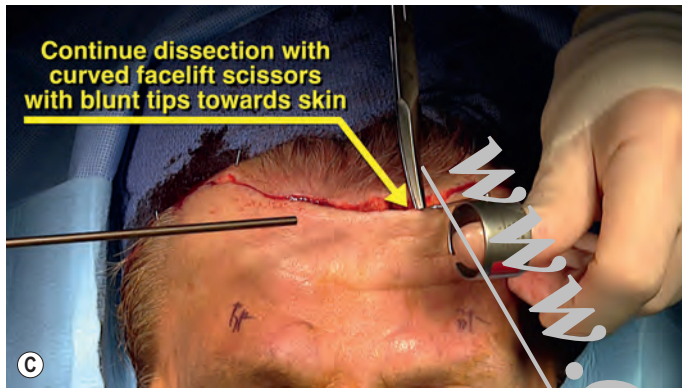
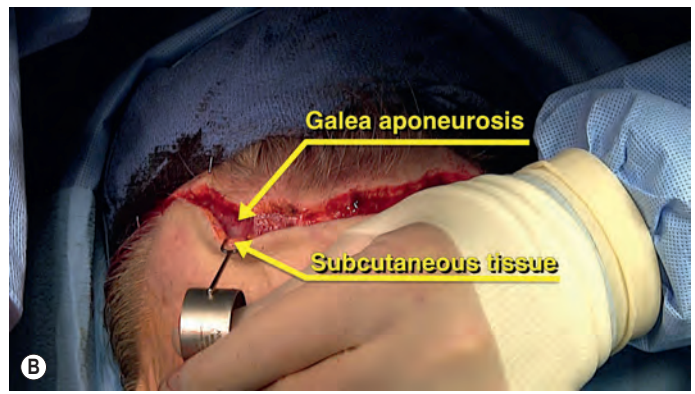
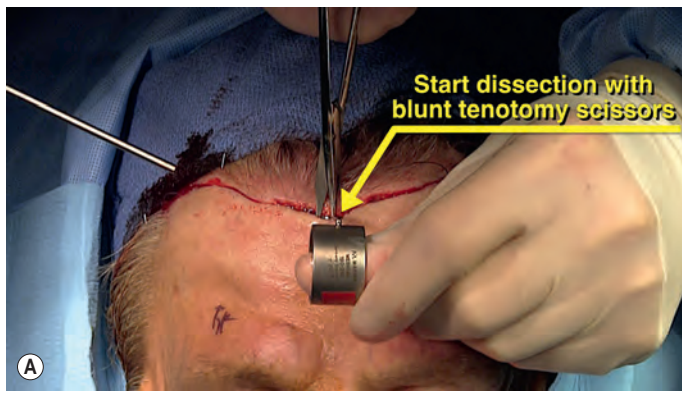
Figures 23.1A–D Skin marking

Pretrichial browplasty is routinely performed under local anesthesia with intravenous sedation. The incision is marked 1 mm anterior to the first row of cilia at the hairline (Figure 23.1A). To address lateral brow ptosis, the marking is extended laterally and may be extended into the hairline to preserve the temporal hair tuft. The supraorbital notch is palpated and marked vertically. A 10-mm radius is marked around the notch as a safe zone for dissection to avoid the supraorbital nerve (Figure 23.1B). Horizontal forehead rhytids can also be marked. At the pretrichial incision line, a mixture of 1% lidocaine with 1:100,000 epinephrine and 0.25% bupivacaine is infiltrated to achieve maximal hemostasis (Figure 23.1C). Dilute anesthetic solution consisting of 0.1% lidocaine and 1:1,000,000 epinephrine is injected subcutaneously throughout the forehead for tumescence to aid dissection and to provide a vascular tourniquet (Figure 23.1D). A sterile preparation of the face and the hair is performed prior to draping. If upper blepharoplasty is also planned, this is marked and injected after completion of the pretrichial browplasty to avoid development of lagophthalmos.



Figures 23.2A and 23.2B Pretrichial incision

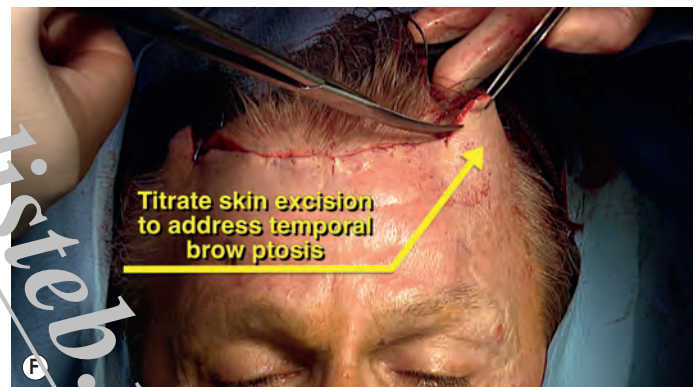
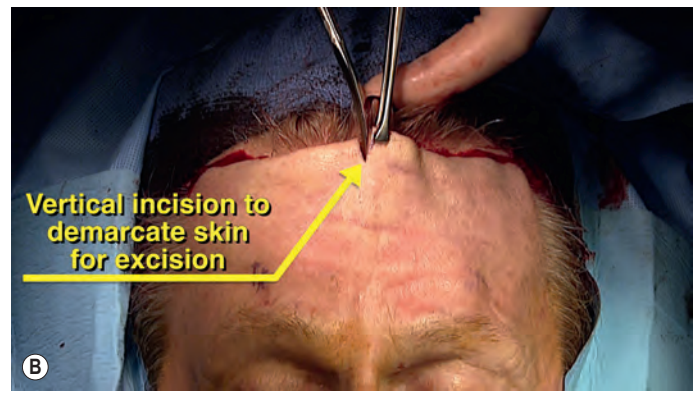
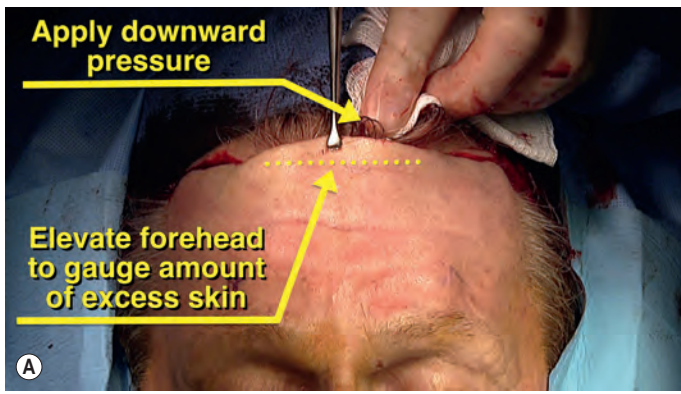
The pretrichial incision is made with a #10 or #15 blade. The incision is beveled to avoid follicular transection and to allow the retained follicles the ability to grow through the beveled flap (Figure 23.2A). At least 10 minutes should elapse after anesthetic infiltration before skin incision to allow for adequate hemostasis. Any residual bleeders can be conservatively coagulated with bipolar cautery (Figure 23.2B). Exuberant cauterization should be avoided as this may lead to alopecia.



Figures 23.3A–E Subcutaneous dissection

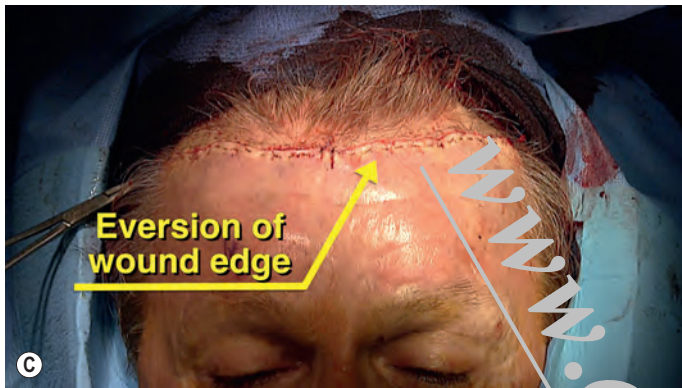
A Cottle thumb hook is used to retract the forehead while a blunt tip tenotomy scissor is used to begin the subcutaneous dissection for the first 10 mm inferior to the incision line (Figure 23.3A). The dissection is performed in the plane between the subcutaneous tissue and the galea aponeurosis (Figure 23.3B). The galea has a white sheen with fine fibers interspersed along its surface. Once this pregaleal dissection plane has been established, curved blunt tip facelift scissors can be used for more rapid dissection (Figure 23.3C). Both sharp and blunt dissection is used to extend the plane inferiorly. Care is taken to avoid buttonholing through the forehead skin during the dissection. The dissection continues towards the orbital rim until the supraorbital safe zone is reached (Figure 23.3D). By staying in the pregaleal plane, the major branches of the supraorbital nerve are avoided. While there may be temporary hypesthesia, sensation to the forehead and scalp should be preserved. Near the lateral brow, care should be taken near the course of the temporal branch of the facial nerve which runs approximately 2 cm above the brow (Figure 23.3E).





Figures 23.4A–F Pretrichial skin excision and subcutaneous closure

Once the forehead has been dissected, pretrichial skin excision is performed. Excision of the redundant pretrichial skin lowers the hairline while simultaneously raising the brows. An Allis clamp is used to elevate the forehead while applying downward pressure on the hair-bearing skin to identify the amount of skin to be removed (Figure 23.4A). Once the excess skin is determined, a vertical incision is made to the desired level (Figure 23.4B). A skin staple is placed to temporarily hold the central incision together (Figure 23.4C). At the temporal aspect of the incision, the excess forehead skin is identified, incised vertically, and secured with a skin staple. A strip of the forehead skin is then excised. In this case, a 15 mm strip of skin is removed (Figure 23.4D). Subcutaneous closure is performed with multiple interrupted circular 5-0 Monocryl sutures (Figure 23.4E). We prefer using Monocryl over Vicryl as this suture is less inflammatory and potentially minimizes hair loss. At the temporal ends of the incision, more skin may be removed to account for temporal brow ptosis (Figure 23.4F).



Figures 23.5A–C Skin closure

Skin closure is then performed with a 5-0 Prolene suture in a running horizontal mattress fashion (Figure 23.5A). Two separate running closures are performed for each half of the forehead (Figure 23.5B). Excellent wound eversion is critical to avoid a noticeable depressed incision postoperatively (Figure 23.5C). The Prolene sutures are removed 7 days after surgery.



PRETRICHIAL BROWPLASTY AND BILATERAL
UPPER BLEPHAROPLASTY



Preoperative



Postoperative



Preoperative



Postoperative

Figures 23.6A and 23.6B Before and after pretrichial browplasty

This 57-year-old female underwent pretrichial browplasty and upper blepharoplasty. She notes marked improvement in her superior visual field as well as aesthetic improvement in forehead rhytids (Figure 23.6A). Examination of the pretrichial incision line shows a well-healed incision as well as lowering of the hairline (Figure 23.6B).