The lateral open forehead lift technique uses 2 scalp incisions to elevate and suspend the lateral eyebrows, and 2 upper blepharoplasty incisions to access the muscles that produce glabellar frown lines and depress the medial eyebrows. Advantages of this technique are that side effects associated with the coronal incision, such as hair loss and overelevation of the medial eyebrow, are avoided. (Aesthetic Surg J 2005;25:169-174.)

For the past 10 years, I have exclusively used the lateral open forehead lift, or limited incision foreheadplasty. I adopted this technique because I was uncomfortable with the side effects of the coronal incision forehead lift. The long scar in the coronal lift was frequently associated with hair loss from the tension of scalp suture closure, and too many patients complained of chronic scalp dysesthesia. Overelevation of the medial eyebrows was another problem with the coronal lift, which I eventually managed to avoid when I stopped excising scalp from the central half of the forehead flap. I found that limiting scalp excision to the lateral ends of the coronal incision line provided good lateral eyebrow elevation in almost all patients. The medial half of the eyebrows rarely needed elevation and, when it did, only slight elevation was necessary.

These experiences led me to the “limited incision foreheadplasty,” which uses a 4.5-cm segment of each lateral end of the coronal scalp incision to raise the forehead flap and securely suspend the lateral eyebrows. The upper blepharoplasty incisions are used to resect the medial eyebrow depressor muscles that antagonize the medial eyebrow elevation effect of the medial frontalis muscle. Resection of these muscles provides modest physiologic medial eyebrow elevation from unopposed medial frontalis muscle tone. The upper blepharoplasty incision approach provides better exposure for treating the corrugator and other muscles (that act on glabellar skin) than the exposure I had obtained using the coronal incision.

I have used this limited incision technique when performing forehead lift in patients of varying ages and with different degrees of facial aging. Figures 1 through 3 illustrate the effectiveness of the technique used in patients ranging from 37 to 77 years of age. Contrary to some algorithms, this procedure is not reserved for the younger patient or the older patient with only early signs of aging. The aesthetic results of this foreheadplasty technique equal the results I obtained using the standard coronal incision approach, but the technique does not have the undesirable side effects of the coronal incision.

**Technique**

Figure 4 illustrates the use of the temporal scalp incision to elevate the forehead and temporal soft tissues. Complete subperiosteal soft tissue release from bone is essential.

Over the temporal fossa, dissection between superficial and deep temporal fascia can proceed quickly until the orbicularis temporal ligament is reached. This transverse ligament is the line of fusion between the superficial and deep temporal fascial planes. It is an important anatomic landmark because only 2 to 4 mm inferior, within the superficial temporal fascia plane, run the most superior rami of the temporal branch of the facial nerve. The superficial and deep fascial planes must be separated across this ligament using a headlight and blunt dissection, with scissors pressed firmly upon the deep temporal fascial plane. This technique leaves the temporal branch rami safely within overlying superficial temporal fascia. After the soft tissue release is complete, cephalad advancement and suture fixation of the superficial temporal fascia lining the forehead flap to the deep temporal fascia will provide stable suspension for the lateral eyebrow.
Figure 5 illustrates the use of each upper blepharoplasty incision for resection of the transverse head of the corrugator supercili muscle and ablation of the medial eyebrow depressor muscles. The corrugator supercilii muscle pulls the medial eyebrow medially to produce vertical glabellar frown line(s), and the medial eyebrow depressor muscles antagonize the action of the medial frontalis muscle to elevate the medial head of the eyebrow. Three of these medial eyebrow depressor muscles, the depressor supercilii, the oblique head of the corrugator supercilii, and the medial head of the orbicularis oculi muscles are excised. The fourth medial eyebrow depressor muscle, the procerus, can be adequately controlled by simple transverse transection (Figure 6).

Technical Points
During my 10-year experience with this limited incision approach,1,2 I have developed the following guidelines to achieve a consistently good cosmetic result:

- Allow the medial end of the 4.5-cm temporal scalp incision to extend no more than 5 mm medial to the palpable superior temporal fusion line of the skull (lateral edge of stripped area in Figure 4). Observing this limit will avoid transection of the deep division of the supraorbital nerve, which runs within the galea between 5 and 15 mm medial to the superior temporal fusion line at the level of the scalp incision.
- Confirm complete soft tissue release over the entire frontal bone, especially above the superior orbital

Figure 1. A, C, Preoperative resting and frowning views of a 37-year-old woman. B, D, Postoperative views 1 year after undergoing limited incision foreheadplasty combined with blepharoplasty.
rim, by palpating the supraorbital rims with a finger through the temporal scalp incisions. Free any remaining periosteal or galeal attachments to bone while protecting the deep division of the supraorbital nerve at its bony exit point from frontal bone. This exit point can be anywhere within the 1.5-cm–wide area immediately above the superior orbital rim.

- Usually, the dissection plane between superficial and deep temporal fascia that passes through the orbicularis temporal ligament will extend to the level of the zygomatic arch (Figure 4). This dissection will expose the sentinel vein, which should be preserved, if possible, because a transected sentinel vein can result in the development of visible, dilated subcutaneous temporal area veins. If the sentinel vein is inadvertently transected, do not try to cauterize the bleeding vessel near the superficial temporal fascia plane. This will avoid injury to the rami of the temporal branch of the facial nerve that run within the superficial temporal fascia. Temporarily packing off the area will generally control any bleeding. A small suction drain tube placed under the forehead flap just lateral to the lateral orbital rim for 24 hours postoperative will minimize swelling and bruising.

- If the forehead flap resists transposition after the soft tissue releases are performed (as indicated in Figure 4), additional cephalad movement of the flap can be obtained with a supraperiosteal release of superficial

Figure 2. A, C, Preoperative resting and frowning views of a 56-year-old woman. B, D, Postoperative views 1 year after undergoing limited incision foreheadplasty with blepharoplasty and facialplasty.
temporal fascia (continuous with the plane of the septum orbitale within the orbit) along the anterior surface of the lateral orbital rim. Dissection in this area often produces temporal chemosis, but this can be controlled by postoperative placement of a temporary lateral tarsorrhaphy suture for 5 days. A laterally placed tarsorrhaphy allows vision through the medial eyelid opening.

- Place a 2.0 reabsorbable (polyglycolic acid) mattress suspension suture between the superficial temporal fascia lining the forehead flap and the superficial temporal fascia under the posterior scalp incision edge very near the medial end of the scalp incision to provide an essentially vertical suspension vector for elevation and optimal support of the lateral eyebrow. Then anchor both of these superficial temporal fascia surfaces to the stable deep temporal fascia plane with a second adjacent suture. Permanent sutures are not needed.

- It is unnecessary to resect any redundant scalp edge generated by forehead flap advancement. Simple suture approximation of the edges of the scalp incision will leave a ridge of scalp. However, this ridge is not visible through groomed hair, and it flattens within 6 to 8 weeks. This step will ensure a minimal risk of alopecia and provide the finest scalp scar.

Figure. 3. A, C, Preoperative resting and frowning views of a 77-year-old woman. B, D, Postoperative views 1 year after undergoing limited incision foreheadplasty combined with blepharoplasty.
After the anterior surface of the superior orbital rim is exposed by dissecting between the septum orbitale and the orbicularis oculi muscle from the upper blepharoplasty incision, the corrugator supercilii muscle may appear to be absent. In this event, the muscle will be found adherent to the undersurface of the orbicularis oculi muscle. Blunt dissection will free it.

The corrugator supercilii muscles will be exposed from origin to insertion with dissection anterior to the supraorbital rims through the upper blepharoplasty incisions. When transecting the lateral end of each corrugator supercilii muscle, take care not to resect any of the adjacent orbicularis oculi muscle because resection of any orbicularis oculi muscle in this area may produce an overlying skin surface depression.

**Figure 4.** Through temporal incisions, forehead soft tissues are elevated at the subperiosteal level over the entire frontal bone with complete release of the bony attachments along the supraorbital rim. Subperiosteal dissection spares the deep division of the supraorbital nerve (SON-D) that runs superficial to periosteum to provide frontoparietal scalp sensation. Through the same scalp incisions a dissection plane is created over each temporal fossa area between superficial and deep temporal fascia. The soft tissue attachments to bone, just medial to the superior temporal fusion line (STL) of the skull (stripped area), and along the lateral orbital rim, are released. The dissection plane between superficial temporal fascia and deep temporal fascia passes through the orbicularis temporal ligament (OTL) and can extend down to the level of the zygomatic arch, as needed for soft tissue release.

**Figure 5.** The muscles that act on glabellar skin are treated through the usual upper blepharoplasty incisions. The scissors transect the lateral end of the transverse head of the corrugator supercilii muscle (CSM-T). Three medial eyebrow depressor muscles are labeled: (1) oblique head of the corrugator muscle (CSM-O); (2) medial head of the orbicularis oculi muscle (MOOM); and (3) depressor supercilii muscle (DSM).

**Figure 6.** Transection of the procerus muscle (P) through the upper blepharoplasty incision.
• Cauterize the supraorbital and supratrochlear veins with a fine forceps, as they are exposed, to avoid troublesome bleeding that obscures visualization of the operative field. Take care to avoid the branches of the supratrochlear nerve that pass through the corrugator supercilii muscle near its origin from the superior-medial orbital rim.

• Complete resection of the entire corrugator supercilii muscle, including the oblique head, will ensure that the depressor supercilii muscle also will be resected because the depressor supercilii muscle directly overlies the corrugator supercilii muscle’s origin (Figure 5). Remove all muscle fibers in this area until the bony superior-medial orbital rim is seen.

• Always excise a 1 × 1-cm area of the orbicularis oculi muscle immediately under the medial end of each eyebrow because these medial fibers of the orbital portion of the orbicularis oculi muscle also contribute to medial eyebrow depression by antagonizing the action of the medial frontalis muscle. A weakened medial head of the orbicularis oculi muscle allows the unopposed medial frontalis muscle to elevate the medial eyebrow.

• The procerus muscle may be the most powerful medial eyebrow depressor muscle because its action most strongly antagonizes the action of the medial frontalis muscle to raise the eyebrow. Therefore, maximal medial eyebrow elevation can be obtained by weakening the action of the procerus muscle in addition to weakening the other 3 medial eyebrow depressor muscles. Procerus is a subcutaneous muscle, and its transection could produce an overlying skin depression. This can be prevented by placing a fascial graft (deep temporal fascia is a good source) over the cut procerus muscle.

• Transient partial temporal nerve palsy may occur in 5% to 7% of patients, but the blunt dissection always used in this technique in the vicinity of the rami of the temporal branch of the facial nerve protects the nerve from permanent harm, and the postoperative patient can be assured that function will return.

This limited incision approach to foreheadplasty can be accomplished without endoscopy and provides stable results comparable with the results of the coronal incision approach. ■

References

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