An Endoscopic Brow Lift That Does Not Raise the Hairline

“Surgical Strategies” focuses on refinements in aesthetic surgical techniques. Contributors are Aesthetic Society members or other recognized experts.

Endoscopic brow lifting has gained popularity among both surgeons and patients, mainly because of the small incisions used in these procedures. However, the effect on the position of the hairline has not been addressed. All of the endoscopic brow lifting techniques previously described slide the forehead and scalp posteriorly, which raises the hairline relative to fixed orbital landmarks.

Is raising the hairline an important issue? No men and very few women want a higher hairline. If given a choice, patients will almost always choose the endoscopic brow lifting method that does not raise their hairline. Hair stylists also prefer that their clients’ hairlines not be raised because they must style hair to compensate for higher hairlines.

**Surgical Strategy**

To avoid hairline elevation from an endoscopic brow lift, I devised the galea aponeurosis plication (GAP) technique. This subgaleal method involves no dissection posterior to the incisions, and only the forehead—not any scalp—is advanced. As a result, the hairline is not raised.

In all endoscopic brow lifts, permanent fixation is achieved by scarring under the entire broad surface of the repositioned forehead flap. Until that occurs, a variety of temporary fixation methods such as pins, screws, sutures, and dressings are used. In the GAP procedure, fixation of the brow elevation is accomplished by plicating the galea aponeurosis along the hairline with six sutures (Figure 1). Excess forehead skin is not resected but is freed from the surface of the galea so it can shrink or redistribute (Figure 2). This process takes 3 to 6 weeks; during this time the small roll of excess skin is hidden along the hairline.

**Operative Technique**

Since the first GAP brow lift was performed 3 years ago, the technique has been improved and refined. Lateral incisions have been deleted to avoid scars in the temporal scalp that show if the patient’s hair is thin or wet from swimming. Because scars on the top of the head are hard to see, the central transverse incision has been lengthened to 5.0 cm to improve exposure. This allows more flap elevation so the corrugator muscles still can be reached with Blakesley graspers when the forehead is convex. In addition, much of the initial dissection now can be done under direct vision with a lighted retractor. The deep branch of the supraorbital nerve (DSO) is raised with the forehead flap and can be visualized on the deep surface of the galea.

(Preoperative skin markings of the nerve’s course between 0.5 and 1.5 cm medial to the superior temporal line are helpful.) On each side of the DSO, 0.5 cm stab incisions are made for use as instrument ports. These stab incisions avoid the DSO to preserve scalp sensation and leave very inconspicuous scars regardless of the amount of hair present. The endoscope is needed only to completely release tissues along the orbital rims from lateral canthus to lateral canthus and to resect the corrugator muscles.

To prepare the galea for plication, it must be freed from the overlying skin along the hairline. This is done with tenotomy scissors in a 1.5 to 2 cm strip anterior to the scalp incisions. At the posterior aspect of each stab incision, a 3-0 Vicryl suture on an RB-1 taper point needle is passed through deep dermis and galea into the subgaleal space. This suture is retrieved through the central incision with a standard 15 cm needle holder. Next, the anterior site for the plication suture is determined by the amount of plication desired and the vertical vector of pull. A percutaneous needle acts as a “target” so the site can be visualized from the subgaleal space. Two or three deep bites of the galea and frontalis muscle are taken and the suture is passed back out through the stab incision. After the galea aponeurosis is plicated at the four stab inci-
Figure 1. A, Incisions are located to avoid the deep branch of the supraborbital nerve, which lies between the dotted lines, 5 and 15 mm medial to the superior temporal line. B, The six galea aponeurosis plication sutures pull against gravity with only vertical vectors. C, Plication sutures provide temporary fixation of the lifted brow until scar tissue provides permanent fixation over the entire area of flap elevation, as shown.

Figure 2. A, The galea aponeurosis is freed completely on the deep surface to mobilize the forehead and just along the hairline on the superficial surface to allow shortening by plication. B, This procedure raises the brow and leaves a roll of excess skin at the hairline to shrink or redistribute.

Subgaleal Versus Subperiosteal Dissection

The GAP endoscopic brow lift is performed entirely in the subgaleal plane. Whereas the recently described microscopic anatomy of the forehead is complex, the surgical anatomy of a subgaleal approach is simple and familiar to most surgeons experienced in open brow lifts. Because dissection is performed in only one plane, the subgaleal approach is easier than the subperiosteal approach, which requires changes to the subgaleal plane to expose the corrugator muscles and to continue the dissection lateral to each of the superior temporal lines. Interestingly, even though the lateral eyebrow has the most proxis, in a subperiosteal brow lift it actually is approached and corrected from the subgaleal plane. Why then use a subperiosteal approach for the rest of the eye-
sions, two more plication sutures are placed at the central incision.

The scalp is closed with staples, and a suction drain is left in place overnight. Dressings should not press on the skin roll. Patients are instructed not to stress the plication sutures by raising the eyebrows (frontalis) or squinting (orbicularis oculi) for 2 weeks.
brow? Furthermore, both the subgaleal and subperiosteal dissections extend through fibrous attachments along the orbital rims to end at the same place, the glide plane space below the brow (galeal) fat pad.

**Vertical Vectors of Pull**

The ratio of the amount of galeal plication to the desired amount of eyebrow lift is about 2:1 or 2.5:1 for the lateral eyebrow, 1.5:1 or 2:1 for the central eyebrow, and 1:1 or 1.5:1 for the medial eyebrow. The direction of pull for each plication suture is as vertical as possible to counteract the effects of gravity. Any lateral vector of pull on the eyebrows should be avoided because this does not counteract gravity and it tends to pull the eyebrows apart, widening the glabellar area. Thus it is recommended that there be no pull from an incision lateral to the temporal line, because this places a lateral vector of pull on the eyebrows. Resection of the corrugator muscles is not a cause of widening in the glabellar area (based on my experience with this as an isolated procedure or in combination with a vertically pulled brow lift).

**Results**

The GAP brow lift technique has been used in patients up to 65 years of age, with disappearance of the skin roll by 6 weeks. In all cases, the amount of eyebrow lift is measured from the lower edge of the eyebrow to the lash line with the eyes closed to inactivate the frontalis muscle. Most patients have between 4 and 6 mm of elevation (Figure 3).

**Summary**

Open brow lifts with long coronal or pre-hairline incisions are increasingly being replaced by endoscopic procedures. Unfortunately, hairline elevation has been a consequence of these new techniques. The GAP brow lift method features very inconspicuous incisions and vertical vectors of pull, and does not raise the hairline. This improves patient satisfaction with brow lifting.

**References**


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