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49.1 Background

49.1.1 Forehead and Eyebrow: Forefront and Main Line of Facial Aesthetics

The orbits and structures surrounding them play a significant role in facial aesthetic and hold a significant role in communicating facial expressions and emotions [1]. A standard description of ideal aesthetic proportions is desired for surgical planning, evaluation of aesthetic outcomes, and avoiding aesthetic complications [2].

Facial aesthetics have been evaluated and analyzed since the Renaissance times by many artists and scientists such as da Vinci, Elsholts and Bergmuller [3].

The importance of the eyebrow shape and position has likewise been studied over centuries with an ongoing debate on defining the aesthetic ideal. It is further subject to the influence of age, sex, race, culture, and current trends [4]. Brow shape trends have varied in different cultures, from darkened, arched, and elongated brows in ancient Egypt, to elongated unibrows in ancient Persia, Roman, and Greek, or even more recently iconic unibrows of Frida Kahlo to various shapes of separate brow trends over the last few decades.

The eyebrow position trends have evolved from high eyebrows positioned above the orbital rim and small eyebrows with a middle-positioned arch to the more recent trend of laterally peaked eyebrows over the lateral limbus with the medial fall over the medial canthus described by Westmore in 1974 [5]. Further discussions among plastic surgeons recommended that the brow arch should be more lateral than what Westmore suggested and be positioned between lateral canthus and lateral limbus with 93% to 98% of the brow arch

in a horizontal plane [2]. Gunter suggested that ideal eyebrow should be defined in relation to other periorbital features and described the ideal eyebrow as a component of an “attractive eye” rather than a single aesthetic unit [6].

In general, eyebrows are classified into three major types:

Arched with the maximum height in the middle of the brow that was more popular in 1930s until 1970s [7, 8].

Low: same eyebrow shape as high with the lateral peak but only with an overall downward shift that has been exhibited by models of beauty magazines.

High: high positioned with the peak at the lateral third of the brow that has been reported to be currently the most attractive trend of eyebrow shape [2, 7].

With the advent of social media the speed in which those trends change has exponentially accelerated and scientific exploration of the ideal has been replaced by the number of “likes.”

The eyebrow is a particularly interesting aspect of facial aesthetics because of the ability to nonsurgically alter its shape through threading and plucking. However, there are factors beyond the control of an individual’s ability to cosmetically alter the shape. Forehead and brow position are related and change in frontalis activation, which alters the brow shape and position. Prolonged activation of the upper third facial muscles can result in transverse forehead wrinkling from (frontalis muscle), glabellar wrinkling (corrugator, procerous, and orbicularis), and brow ptosis (corrugator and orbicularis) and eventually lead to eyebrow-forehead complex deformities [9].

Major forces involved in brow ptosis are the resting tone of frontalis muscle (responsible for suspending brows medial to the temporal fusion lines); hyperactivity of corrugators along with orbicularis oculi muscle that facilitates descent of the brow and counteracts with frontalis muscle effect; and the last force is gravity which has the most constant effect on all facial soft tissue mass and pulls the eyebrows down. Knowledge of these forces is helpful in correction planning and re-shaping the eyebrow into a more desired shape [9, 10].

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49.1.2 Facial Rejuvenation, Where Forehead and Eyebrow Stand on the Upper Third

As human life span has increased over time and with development of new surgical and noninvasive techniques with better outcomes, the demand for rejuvenating surgeries has been growing [11]. The complex interplay of facial subunits makes this particularly challenging when compared to other aesthetic procedures that stand more in isolation. A combination of progressive changes to the skin, soft tissue, and bone are the main factors associated with facial aging [12–14]. These include bony atrophy and remodeling, volume loss, fat prolapse and atrophy, skin laxity, and thinning and drooping of tissue [14].

Forehead and brow lift are among the popular surgical procedures used for facial rejuvenation and are also commonly offered to trans feminine patients as part of facial feminization surgeries [15]. Particular to this population is the need for osseous alterations to achieve the desired brow elevation and shape. Another emerging trend is the lowering of the hairline for both cis-gender and trans-feminine patients.

Multiple surgical and nonsurgical interventions have been invented and used over time for forehead and brow lift. Given the complexity of forehead-brow relationship, understanding of surgical anatomy is necessary to properly plan the surgical and nonsurgical intervention for each individual patient.

49.2 Surgical Anatomy

The eyebrow consists of a gliding superficial muscle plane covered with hair follicles with limited growth and regeneration potential that extend between the glabella medially and the temporal region laterally [14, 16]. Forehead and brow muscles are divided into three groups of superficial (frontalis, orbicularis oculi, and procerus), intermediate (depressor supercilii), and deep (corrugator) (Fig. 49.1) [17].

49.2.1 Frontalis Muscle

Frontalis muscle is the anterior belly of the occipitofrontalis muscle, the main muscle structure of the eyebrow, originates at the bifurcation of galea where it splits into deep and superficial layers and inserts into the brow where it interdigitates with corrugator and orbicularis oculi muscle [16]. Blood supply to frontalis comes from supratrochlear and supraorbital arteries, branches of ophthalmic artery [18]. Although frontalis muscle attachments to the thin skin of upper eyelid are loose, it is firmly attached to the thick forehead skin over the eyebrow area.

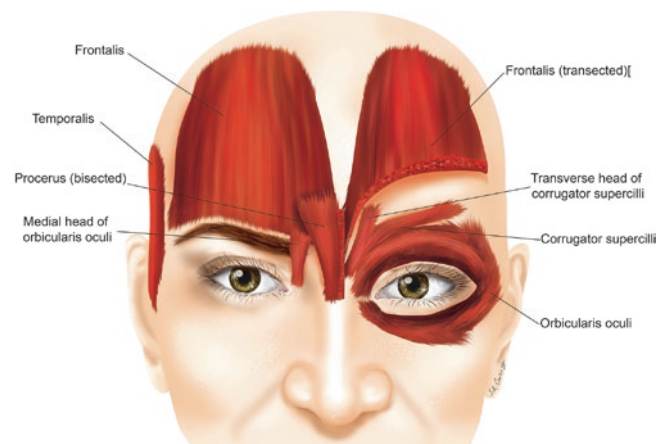


Fig. 49.1 Anatomy of major forehead muscles

49.2.2 Orbicularis Oculi

Orbicularis oculi is a sphincter muscle located in close proximity to the fine dermis of the eyelids. While its main function is to voluntarily close the upper and lower eyelids and involuntarily control blink, it interlinks with the forehead and brow muscles [19]. The three components of orbicularis oculi are pretarsal, preseptal, and the orbital orbicularis oculi that all originate from medial canthal tendon. The orbital orbicularis is one of the main depressors of the brow and as such influences the brow position [18].

49.2.3 Procerus

The procerus muscle is a pyramidal-shaped muscle that works as a part of glabella complex that depresses the medial end of the eyebrow. It originates from the fascia of the upper nasal area adjacent to nasal bone junction and superolateral nasal cartilage. It runs superiorly, merges into frontalis muscle fibers, and eventually inserts into the skin between eyebrows [20].

49.2.4 Depressor Supercilii

The depressor supercilii is a fan-shaped muscle that inferiorly displaces the medial part of the eyebrow. It arises 2–5 mm inferior to the frontomaxillary suture line of the maxillary bone, and inserts in the dermis approximately 15 mm superior to the medial canthal tendon under [17].

49.2.5 Corrugator Supercilii

The corrugator muscle is a paired muscle at the medial end of the eyebrows. It elevates the medial portion of the eyebrow

while depresses the lateral end of the brow. This muscle consists of a transverse head (originates from the superiomedial border of the orbital rim and attaches to the dermis of the mid portion of the brow, orbicularis oculi, and frontalis muscles) and an oblique head (inserts into medial brow and runs parallel to the depressor supercillii). The insertion point of the lateral end of the muscle may vary and could extend into the lateral third of the eyebrow [21].

49.2.6 Clinical Pearl

“This anatomical relationship is important to know to better understand the dynamic relation between forehead lift and brow lift and also their impact on upper eyelid position after these surgeries.”

“Orbital orbicularis function as a major depressor of the eyebrow makes it an important target for non-surgical brow lift using toxin injections”.

“Eyebrow hair is different from scalp’s and has limited regrowth and regeneration potential after injury”.

“Female eyebrow is usually located more superiorly with a greater arch while male type eyebrow is more flat and positioned lower on the superior orbital rim”.

“Main contraindication to brow and forehead lift procedure is lagophthalmos; all patients should be asked about dry eye symptoms and relative physical exam should be done [22]”.

“Brow lift should always precede upper blepharoplasty in patients who require both surgeries to avoid overcorrection of the upper eyelid ptosis resulting in lagophthalmos and its complications”.

49.3 Nonsurgical and Surgical Techniques

Forehead and brow lift were first described by Erich Lexer in 1910 using a coronal approach. Since then, surgical and nonsurgical methods have evolved allowing for an individualized approach based on exam, patient expectation, and surgeon’s comfort and preference [18].

49.4 Forehead and Brow Lift

49.4.1 Nonsurgical Brow Lift

49.4.1.1 Neurotoxins

The use of neurotoxins to counteract rhytids and alter the position and shape of the brow has become the most common cosmetic procedure in the United States [23].

This was first hypothesized after observing patients with the “surprised face” as a side effect of overtreatment of gla-

bellar frown lines. In 1998, Frankel et al. used neurotoxins for medial brow lift [24]. Then, in 1999, Ahn et al. suggested that paralysis of primary depressors of the lateral brow or the orbital segment of orbicularis oculi using neurotoxins would result in unopposed activity of the frontalis muscle and eventually lead to temporal eyebrow elevation [25]. They injected 7–10 units of botulinum toxin A into the superolateral portion of orbicularis oculi muscle that resulted in significant elevation of the eyebrow (average of 1 and 4.8 mm elevation in mid-pupillary and lateral canthus respectively) [26].

Outcomes of neurotoxin injection for brow lift are age-dependent with younger patients achieving more brow elevation than older patients, presumably related to decreased frontalis muscle tone with aging [27].

Patients should be informed that although this is a noninvasive method, it has limitations and complications. Limitations include unpredictable amount of elevation and temporary nature of this treatment and therefore need for repeated treatments. Complications include inadvertent paralysis of adjacent muscles resulting in diplopia (lateral rectus involvement) and upper lid ptosis (levator palpebrae superioris involvement). These complications are rare and could be avoided by injecting about 2 cm outside the orbital rim (Fig. 49.2). The more common complication is bruising that can be minimized by stretching the skin while injecting and adequate light to avoid small visible vessels [26].

Neurotoxins are also a suitable adjunct to a surgical brow lift. Paralyzed brow depressor muscles are thought to help maintain the elevation during the healing phase [25].

49.4.1.2 Calcium Hydroxylapatite

Calcium hydroxyapatite (CaHA) is a long-lasting, biodegradable, and biostimulatory filler that has been increasingly used for different aesthetic purposes such as volumizing, contouring, and lifting procedures including brow lift [28].

Although non-diluted CaHA has been used for this method of noninvasive brow lift, the standard dilution of CaHA is the preferred concentration (0.3 mL 1% lidocaine

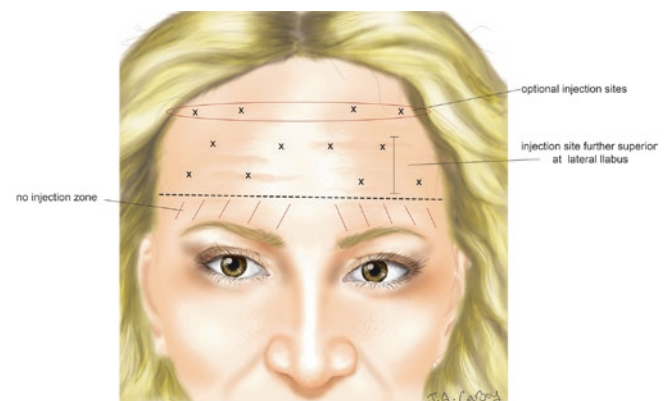


Fig. 49.2 Safe zones of neurotoxin injection for forehead and brow lift

with 1:200,000 epinephrine per 1.5 mL syringe of CaHA [28]. CaHA injection for brow lift is usually performed through injections lateral to the brow tail (subcutaneous) and supraorbital rim (subperiosteal). To avoid accidental intravascular injections, blunt tip cannulas are preferred over needles whenever possible [29, 30].

First, the cannula is inserted lateral to the brow tail, advanced subcutaneously just underneath the brow hairline and as it is slowly being retracted, multiple linear threads of filler are injected into the subcutaneous plane (a total of 0.05–0.1 mL). Then, the cannula is redirected toward the supraorbital rim into the subperiosteal plane just lateral to the supraorbital neurovascular bundle and small threads of filler are injected while retracting (total of 0.1–0.2 mL). Both injections are performed through a single entry injection site (Fig. 49.3) [28].

Edema and pain are the most common adverse events of this method; however, more serious, but rare, complications including tissue necrosis or blindness due to intravascular injection, late onset inflammatory reaction, or CaHA nodules can also occur. As mentioned, using cannula is helpful to lower the risk of entering blood vessels. If cannula is inserted

into an area with dense tissue, the risk of entering a blood vessel is higher. Knowledge of anatomy, low-pressure injection, delicate handling of the cannula, and small volume injection (less than 0.025 mL with each retrograde thread) are essential to minimize this risk. In addition, temporary block of the supratrochlear artery while injecting into that area could reduce the risk of embolization and blindness. This could be done using the nondominant thumb while injecting into that area [28, 31–33].

The key to avoid CaHA nodules is smooth retraction of the cannula while injecting. It is important to know that currently, there is no reversing agent available for CaHA. In case of an unsatisfactory injection, overcorrection or nodule, one can massage the area to redistribute the filler or inject saline or sterile water into the area [33]. A combination of dexamethasone, triamcinolone, and 5-fluorouracil is also reported to be effective in the management of CaHA nodules [34].

49.4.2 Surgical Brow Lift

Multiple surgical methods have been introduced for brow lift with the endoscopic and open being the two broader categories. A plethora of open brow lifts have been described in the literature. The coronal approach for forehead and brow lift was first described by Gonzalez-Ulloa in 1962 [35]. This method requires a long incision across the whole temporoparietal scalp resulting in a long scar. Two commonly used variations of this incision are the coronal incision and the pretrichial hairline incision. The standard coronal incision includes a curvilinear deviation and is placed 7–9 cm posterior to the anterior hairline. Given the extent of surgery and scar size, this method is less commonly used for an isolated brow lift when less invasive methods are feasible. However, in patients requiring a coronal approach for other indications (such as forehead contouring and sinus set back in facial feminization), brow lift could still be performed through a coronal incision [15]. Other approaches include temporal brow lift, direct brow lift, and endoscopic brow lift are more commonly done and will be discussed in more detail.

Each method has its own advantages and disadvantages; however, surgeon's personal experience and skills play a significant role in choosing one method over the others.

49.4.2.1 Direct Brow Lift

Direct brow lift is usually recommended for patients with thick brows, bald patients or those with high hairlines (≥ 10 cm), patients with asymmetric brows or those who need a global eyebrow shaping [36]. The method is more often used for male patients. In the absence of preexisting



Fig. 49.3 Single entry injection of fillers for forehead and brow lift through the lateral brow tail injection entry

deep rhytids, the scar from this is more visible than other methods. If patients have thick brows, it can be hidden close to the superior border of the eyebrow and also in bald patients or those with receded frontal hairline; other methods would result in more visible scars than direct brow lift.

Direct brow lift consisted of two curved transverse incisions above the brow and the eyebrow will lie over a transverse line between the two incisions (not at the level of the upper incision) (Fig. 49.4) [37].

It is important to avoid damage to the brow hair follicles by holding the scalpel parallel to the hair shaft axis. Incision depth should not be beyond the subcutaneous fat to avoid damage to nerve endings [38]. Direct brow lift is frequently performed in conjunction with upper blepharoplasty.

49.4.2.2 Temporal Forehead/Brow Lift by Galeapexy

This method was first described by Fogli for rejuvenation of patients with signs of temporal aging that are hard to be addressed by a full face lift, including lowering of tail of the brow, crow's feet, and malar area wrinkling [39]. Brow tail is 1/4 to 1/3 of the total brow length and is not created by the frontalis muscle. Instead, it is more influenced by brow depressor muscles. Therefore, lifting of the frontalis muscle would not effectively address lateral brow ptosis; instead, a temporal lift would more appropriately address that issue. Temporoparietal fascia lift is the key for this procedure. Anatomically, it is the lateral extension of galea lateral to the temporal crest (Fig. 49.5).



Fig. 49.4 Direct brow lift and upper blepharoplasty in a patient with bilateral ptotic upper eyelid and eyebrows (preop, intraop-markings, and postop, respectively)

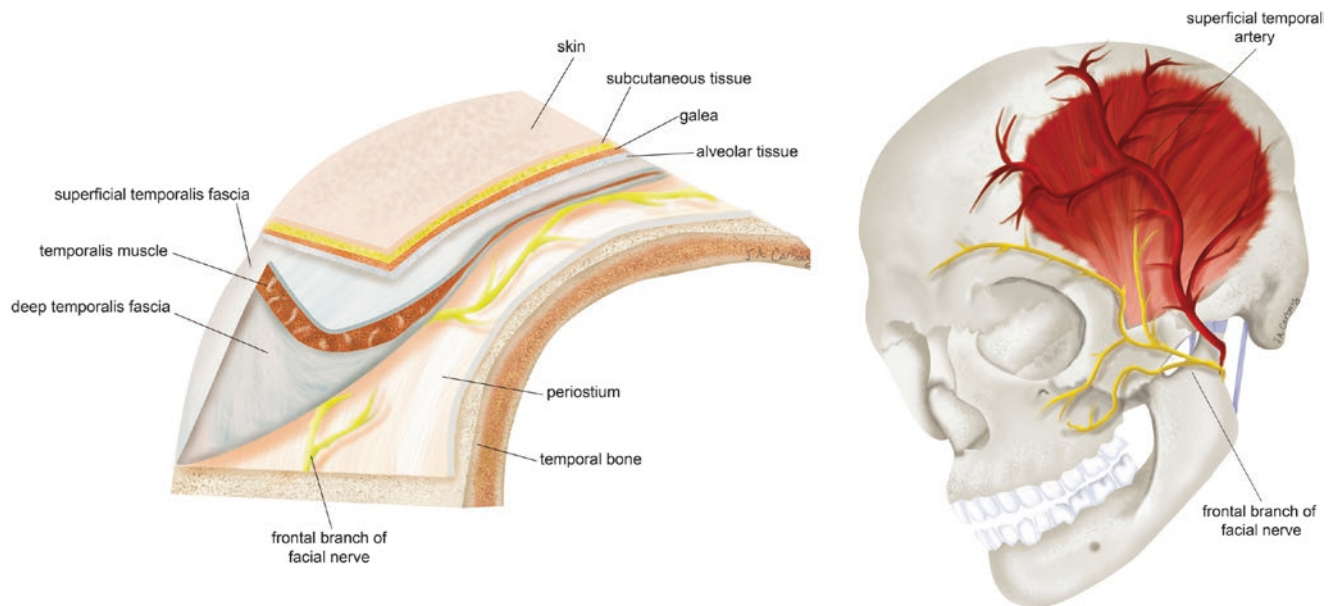


Fig. 49.5 Left: layers of scalp and their relationship with soft tissue layers in the temporal area; temporoparietal fascia is the extension of galea lateral to the temporal crest. Right: critical anatomic structures of

the temporal area: frontal branch of the facial nerve and superficial temporal artery

An important structure that is at potential risk of injury during this procedure is the temporal branch of the facial nerve which is located between deep layer of temporoparietal fascia and the periosteum, 1–1.5 cm below the horizontal projection of the brow.

The main landmark for this method is the temporal crest. A 3–4 cm straight line perpendicular to the temporal crest is drawn 3–4 cm posterior to the hairline. Then, a second line is drawn 1 cm anterior to the hairline parallel to the first line (Fig. 49.6).

This procedure includes three surgical dissection planes: the subperiosteal (minimal risk of nerve damage), subgaleal (minimal risk of damage to hair follicles), or subcutaneous. The classic Fogli starts with a subperiosteal dissection, transitions into the subgaleal down to the second line, and then transitions into subcutaneous plane just below the level of lateral canthus [39]. The modified Fogli described by Verpaele et al. only starts with subgaleal and then transitions into the subcutaneous plane without getting into the subperiosteal plane [40].

In classic Fogli, incision is made using a knife, dissection is carried out through the subperiosteal plane and then into subgaleal plane down to the second line and finally into the

subcutaneous plane down to the lateral orbital rim underneath the brow.

As a result, temporoparietal fascia (galea) is divided at the level of the second line and from there, tissue is undermined caudally down to the lateral brow. Therefore, any pulling force on the proximal edge of the divided galea will slide the eyebrow up, leading to a lateral brow lift. Once the temporoparietal fascia is in the desired position, two or three U-stiches are used to pull the cranial edge of the transected temporoparietal fascia cephalad and fix it to the temporoparietal fascia on the other side of the skin incision. The direction of transverse part of the U-stiches should be parallel to the scalp incision to prevent tearing. The galea is basically only used as the vehicle for repositioning of the brow tail that is attached to the skin flap. These would result in a skin fold that would determine how much excess skin needs to be resected.

This second line defines the extent of the subgaleal dissection; however, the subcutaneous dissection could be carried down to the orbital rim or the zygomatic arch. It is possible to transition from subgaleal plane into subcutaneous plane if surgeon needs to carry out dissection beyond the anterior border of the subgaleal plane.



Fig. 49.6 Upper: left: horizontal line inferior and parallel to the hairline is the scalp incision, the line perpendicular to the scalp incision demarcates the temporal crest; center and right: after undermining of

different planes connecting the scalp incision to the upper brow incision. Lower: pre- and postop photos of temporal forehead and brow lift

This method could be performed as an isolated procedure for lateral brow lift or as an adjunct to facelift.

Hematoma, alopecia, damage to the temporal branch of the facial nerve, and atrophic scar from superficial suture placement are the main complications reported with this technique [39, 40].

49.4.2.3 Pretrichial/Trichophytic Brow Lift

Pretrichial brow lift is another commonly used method for brow elevation as well as forehead rejuvenation (Fig. 49.7). While not requiring any special equipment (endoscopic tools

or anchoring devices), this method can provide other advantages such as shortening the forehead in patients with a long forehead, as well as advancement of the anterior hairline more anteriorly in patients with receding hairlines [41]. Pretrichial brow lift is then more appropriate for patients with normal or elongated forehead. Skin quality evaluation is important as patients with thick and heavy skins (such as those with rosacea or sebaceous skin) have higher tendency for relapse.

Depending on patient and surgeon's preference, this operation could be performed either under sedation or general



Fig. 49.7 Pretrichial forehead and brow lift in a male to female gender affirming facial surgery. Upper and lower rows: preop and postop photos; middle row: bicoronal approach was chosen to provide enough exposure for forehead lift, brow lift as well as to frontal sinus (to perform a concomitant frontal sinus set back as a part of facial feminization surgery). Left: scalp and forehead fully elevated down to the

glabella; middle: frontal sinus anterior table plated after frontal bossing has been addressed; right: excess skin of the forehead marked to be resected and be advanced to provide more feminine appearance in this patient. It is important to note that these procedures in transgender patients are therapeutic and not cosmetic but the same technique could be used for cosmetic surgery as indicated



Fig. 49.7 (continued)

anesthesia. Position is supine with some degrees of reverse Trendelenburg. After standard prepping, hair is combed posteriorly; elastic rubber bands could be used as needed. Water-based sterile gel or Bacitracin ointment could also be used to keep hair out of the surgical field. Once the hairline is revealed, temporal fusion lines are marked as the lateral ends of the incision and then an irregular incision line is marked a few millimeters inside the hairline. Irregularity of the incision helps to camouflage the scar. Local anesthetic with epinephrine is used to decrease bleeding. Then, an anteriorly beveled incision is made to minimize damage to hair follicles. Flap elevation could be done in either subcutaneous [42, 43] or subgaleal planes [41]. The subgaleal has been advocated as an easier plane for dissection with augmented vascularity to the flap that also protects frontal branches of the facial nerve [44]. In cases of severe lateral brow ptosis, surgeon may need to release the temporal fusion line. By the end of the dissection, significant overlap between forehead flap and hair bearing skin is required and if it has not achieved, the hair-bearing scalp could also be undermined in the same plane and advanced anteriorly. A midline cut (with a roughly similar length of the excess skin) divides the flap into left and right flaps to facilitate inset. Temporary inset is performed by stapling and then excess forehead skin is excised and layered closure is performed using long-lasting resorbable sutures. Fibrin sealants prior to the closure could be used as an extra support for stability of the lift. A pressure dressing is recommended for the first 24 hours postoperatively to minimize risk of fluid collection.

49.4.2.4 Endoscopic Brow Lift

Endoscopic brow lift has been used to surgically correct brow height and shape and asymmetry. It is used in patients with ptotic brow secondary to aging, trauma or congenital deformities as well as in patients with pseudo-blepharoptosis or restricted visual field secondary to brow ptosis.

The ideal patients for endoscopic brow lift are those with brow ptosis with redundant forehead and temporal skin and a normal to short hairline (less than 6 cm brow to hairline distance). Besides general contraindications to surgical brow lift (lagophthalmos, dry eye, or history of upper blepharoplasty), the endoscopic brow lift-specific contraindications include excessive hairline recession, that may be exaggerated postoperatively, and excessive frontal bossing or curve that may prevent passage of endoscopic tools.

There are multiple suspension methods that are available including suture fixation (to screws, plates, and bone tunnels) or absorbable fixation devices that engage both preosteum and bone.

In addition to regular surgical instruments, this procedure requires a 5-mm 30° rigid endoscope with retractor/cowling and a variety of curved endoscopic dissectors and elevators [45].

Endoscopic brow lift could be performed under local anesthesia and tumescent injection only; however, most cases are done under general anesthesia or sedation for patient comfort. Supratrochlear and supraorbital blocks can help with postoperative pain control.

Landmarks for surgical planning are supraorbital notch, proposed brow peak, course of the frontal branch of the facial nerve, and sentinel vein. Standard precautions for eye protection are required.

With patient in supine position, surgeon stands at the head of the bed facing monitors at the feet. Bed rotated 90° and placed in 5–10° reverse Trendelenburg. Five 1-cm incisions are marked using the following landmarks:

1. Midline coronal incision 1.5 cm posterior to the hairline.
2. Lateral incisions in a sagittal plane, one on each side just medial to the temporal line along the maximal brow elevation.
3. Temporal incisions 1 cm posterior to the hairline in the coronal plane.

Median and paramedian incisions are carried down to the bone using a 15 blade. Then, the frontal flap is blindly elevated at the subperiosteal plane. This dissection starts using a No. 9 and then, when approaching the curved area of the forehead, is carried down to the supraorbital rim using a curved endoscopic periosteal elevator. Both medial and lateral dissections are continued using median and paramedian incisions. At this point, a 30° endoscope is inserted through the median port for further dissection down to the supraorbital rim under direct visualization to preserve supraorbital nerve.

Then, temporal incisions are made and carried down to the temporoparietal fascia. Superficial temporal vessels could be ligated if encountered. Then, the incision is bluntly extended to the deep temporal fascia. The temporal fascia is bluntly opened from 1 cm above the zygomatic arch to the superior temporal line and dissection is continued anteriorly to the lateral orbital rim. In order to protect the frontal branch of the facial nerve, inferior elevation should be stopped once the confluence of the deep and superficial temporal fascia is encountered. To provide enough laxity for redraping of the temporal skin while preserving the hairbearing scalp, the superficial temporal space should be further elevated posteriorly to open the entire space posterior to the temporal incision.

Now, endoscope is inserted through the temporal incision to visualize the zygomaticotemporal bundle. If further mobility of the temporal skin is desired, this bundle could be ligated.

Further dissection is performed bluntly through the temporal incision to connect the temporal flap with the forehead flap that was previously elevated through median and paramedian incisions.

In patients with muscle hyperactivity, myotomies (NOT myomectomies) could be performed at this step. Depending on which muscle is hyperactive, myotomies of corrugator, procerus, lateral orbicularis oculi, or frontalis could be performed using electrocautery. Myomectomies are discouraged due to high risk of contour deformity and muscle dysfunction [46, 47].

Now, both forehead and temporal skin are evaluated for passive mobility to reach to the desired location. Further release is performed if any resistance is detected.

Temporal flap is secured in the posterior-superior direction using 0 PDS suture. Then, with the help of an assistant, the temporoparietal fascia is pushed toward the desired direction and secured to the deep temporal fascia. The forceful push helps to achieve the maximum tightening of the lift. A second suture from inferiomedial of the temporoparietal to the superolateral of the deep temporal fascia reinforces the tightness.

Then, frontal flap is secured over the paramedian incisions. Multiple fixation techniques have been described for endoscopic brow lift including the use of fibrin glue, screws, external bolsters, mini plates, absorbable suture anchored to a bone bridge, Endotine® MicroAire or Charlottesville VA system [48]. External bolster and screw have higher risks of alopecia associated with pull to the skin and chance of protrusion, respectively. Endotine system has better long-term outcome but associated with higher cost. Absorbable suture anchor to the bone bridge using 2–0 Vicryl or 2–0 Maxon has been described to be both reliable and cost-effective.

After fixation, results are checked and symmetry is evaluated. When desired outcome is confirmed, incisions are closed using a stapler.

There is still controversy regarding the degree of brow lift. Although some surgeons overcorrect the brow, it has been avoided by many others because it may result in over-feminized appearance (with lateral brow over elevation) and/or disappointed expression (with medial brow over elevation) [48].

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