
Techniques in Cosmetic Surgery

Brow Suspension, a Minimally Invasive Technique in Facial Rejuvenation

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People tend to prefer noninvasive or minimally invasive methods of facial rejuvenation, especially when it involves their face, which is the hallmark of a person's identity and impossible to hide. It is widely known that brow ptosis gives the face a "tired look" and also accentuates deformities of the upper eyelid. Most people who are interested in facial rejuvenation may not accept even a minor surgery, such as an endoscopic surgery. The senior author has developed a minimally invasive method of suspending the brow at a higher position. In this technique, there is neither surgical dissection nor a surgical incision except for four stab incisions and suture insertion, which is why we refer to it as a nonsurgical brow suspension. It is done under local anesthesia, and the brows are fixed in the position that they assume when the patient is supine. In the past 6 years, we performed 387 brow suspensions on 324 female and 63 male patients. The youngest patient was 19 years old, and the oldest was 74 years old. A retrospective chart review was done. These 387 cases were reviewed by comparison of preoperative and postoperative photographs. This approach was not only used for patients who were not interested in surgical rejuvenation but was also combined with lipofilling, laser resurfacing, and/or upper blepharoplasty. This technique is useful for correcting postsurgical brow asymmetry. We present this technique as an adjunct to the established techniques of facial rejuvenation. Despite the high patient acceptance and technical ease, it is not a replacement for the established techniques of facial rejuvenation. (*Plast. Reconstr. Surg.* 109: 2521, 2002.)

Human life expectancy and the quality of life have been increasing; as a result, people are becoming more conscious of their health and their looks. In the past two decades, there has been an exponential increase in the number of people who are interested in facial rejuvenation. How does this increase reflect on the practice of plastic surgery? According to the statistics announced by the American Society

of Plastic Surgeons, there was an increase of more than 25 percent in the number of lipoplasties and breast augmentations from 1998 to 1999, whereas the number of facelifts increased by only 3 percent. According to the statistics announced by the American Society for Aesthetic Plastic Surgery, there was a 115 percent increase in the number of lipoplasties and breast augmentations from 1997 to 2001, whereas the number of facelifts increased by only 18 percent, and the number of Botox injections increased by 2356 percent. Total sales in the U.S. skin care market were \$3.5 billion in 1999¹ and sales of antiaging cosmetics reached more than \$3 billion in 2000²; that is a fivefold increase from 1995. Furthermore, Botox injections, collagen injections, chemical peels, microdermabrasion, and sclerotherapy accounted for nearly 64 percent of the 8.5 million cosmetic procedures performed in 2001.³ Furthermore, facial treatments with laser resurfacing, dermabrasion, and chemical peels accounted for nearly 20 percent of the 2.7 million cosmetic procedures performed in 1998.⁴

People tend to prefer noninvasive or minimally invasive methods of facial rejuvenation, especially when it involves their face, which is the hallmark of a person's identity and impossible to hide. It is widely known that brow ptosis gives the face a "tired look" and also accentuates deformities of the upper eyelid. Most people who are interested in facial rejuvenation may not accept even a minor surgery, such as an endoscopic surgery. The senior author has developed a minimally invasive method of sus-

pending the brow at a higher position.⁵⁻¹¹ In this technique, there is neither surgical dissection nor a surgical cut except for four stab incisions and suture insertion, which is why we refer to it as a nonsurgical brow suspension.

PATIENTS AND METHODS

In the past 6 years, we performed 387 brow suspensions on 324 female patients and 63 male patients. The youngest patient was 19 years old, and the oldest was 74 years old. Fifteen percent of the patients had brow suspension alone, and the rest of the patients had multiple procedures at the same time (Fig. 1).

Methods

A retrospective chart review was conducted. The 387 cases that we performed in the past 6 years were reviewed by comparison of preoperative and postoperative photographs.

Operative Technique

The patient is marked in a supine position (Fig. 2). The points for the stab incisions are marked: two directly above the brow and two at the temporal hairline (Fig. 3, above, left). This area is infiltrated with lidocaine with epinephrine. The stab incisions are performed by using a #11 blade (Fig. 3, above, left).

A 4-0 nylon suture is placed from the medial to the lateral brow incision, and the needle of the suture is cut (Fig. 3, above, center). An angiocatheter is tunneled in an immediate subdermal plane from the lateral hairline incision to the lateral brow incision, and the lateral end of the suture is introduced through the tip of the catheter. The catheter is pulled out, leaving the suture in place (Fig. 3, above, right). The



FIG. 2. The contrast of the brow position is illustrated when comparing a patient who is standing and in a supine position. When supine, the pull of gravity is eliminated and the patient has a fresher look.

same move is repeated through the medial stab incisions so that both of the suture ends are transferred to the hairline incisions. Last, the lateral end of the suture is transferred to the medial hairline incision by using the angiocatheter (Fig. 3, below, left). The knot is placed and tightened just enough to keep the brows at the position that they take while the patient is supine (Fig. 3, below, center). The brow suspension can be repeated through the whole length of the brow if needed (Fig. 3, below, right).

Brow suspension can be done at the same time with an upper lid blepharoplasty. In this case, there is no need to make the stab incisions above the brow; the blepharoplasty incision can be used instead (Fig. 4).

RESULTS

All patients benefited from this approach, and they were very satisfied—especially after seeing before and after photographs. With this

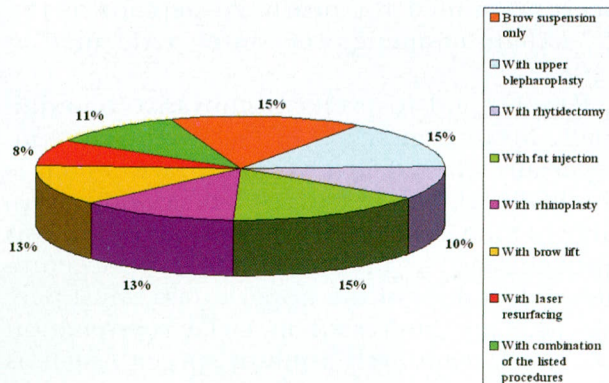


FIG. 1. Distribution of procedures performed with brow suspension. Fifteen percent of the patients had brow suspension alone, and the rest of the patients had multiple procedures at the same time.

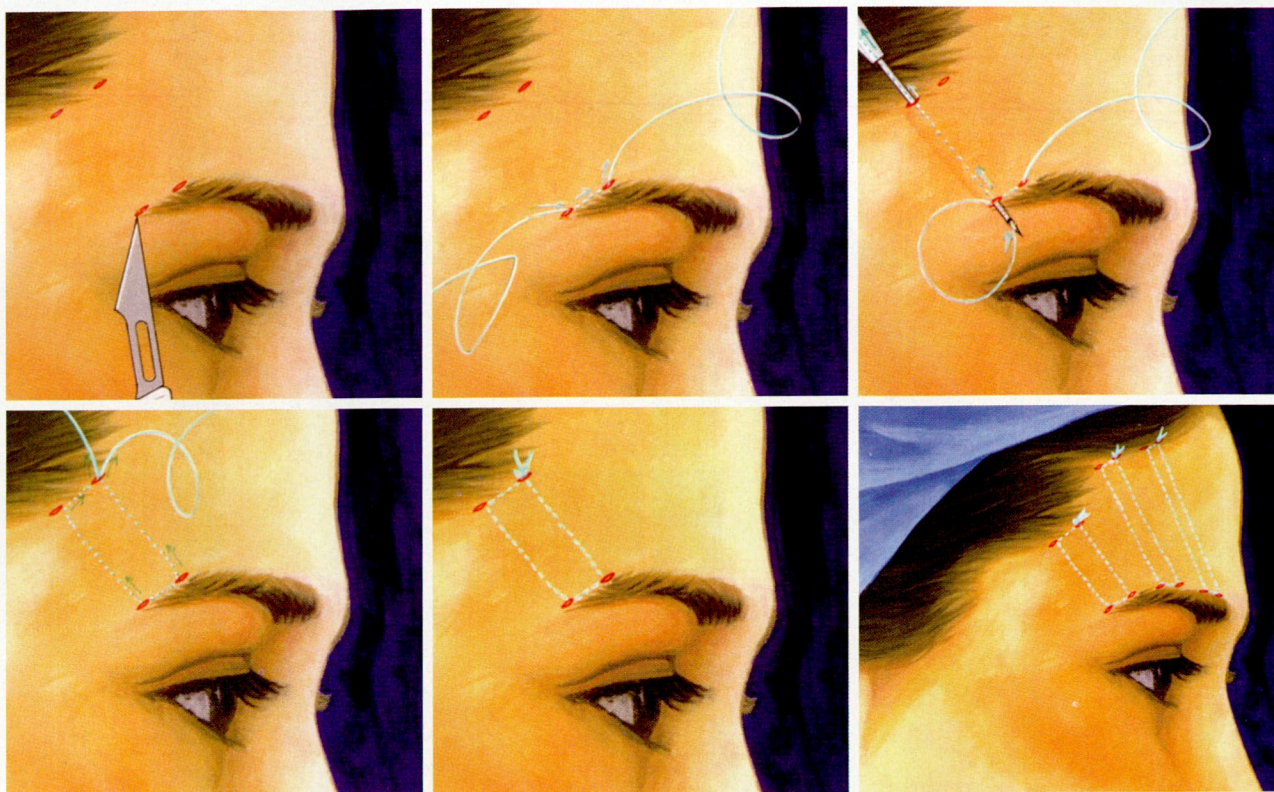


FIG. 3. (Above, left) The points for the stab incisions—two directly above the brow and two at the temporal hairline—are made with a #11 blade after the area has been infiltrated with lidocaine with epinephrine. (Above, center) A 4-0 nylon suture is placed from the medial to the lateral brow incision, and the needle of the suture is cut. (Above, right) An angiocatheter is tunneled from the lateral hairline incision to the lateral brow incision, and the lateral end of the suture is introduced through the tip of the catheter. The catheter is pulled out, leaving the suture in place. (Below, left) The same move is repeated through the medial stab incisions so that both of the suture ends are transferred to the hairline incisions. Last, the lateral end of the suture is transferred to the medial hairline incision by using the angiocatheter. (Below, center) The knot is placed and tightened just enough to keep the brows at the position that they take when the patient is supine. (Below, right) The brow suspension can be repeated through the whole length in the lateral, central, and medial parts of the brow.

procedure, it is important to note that the patient should be clearly informed that this is not a lifting but a suspension procedure. This approach improved the periorbital rejuvenation alone or with simultaneous utilization with lipofilling, laser resurfacing, and/or upper blepharoplasty. There were no complications except for suture exposure in four patients and suture rupture in one patient, which was revised with 10 minutes of intervention. There have been no sensory changes on the forehead. Occasionally, the outline of sutures can be seen in the early postoperative period, but it resolves as the edema fades away.

DISCUSSION

People are still afraid of surgery, especially when it involves their face. They still tend to prefer noninvasive or minimally invasive methods of facial rejuvenation. Aesthetic surgery is a very competitive field, and this continues to

increase. The competition involves not only plastic surgeons but also many other specialists who have so-called aesthetic practices. In this difficult race, we have to increase the number and the quality of techniques that are available to attract patients whose expectations all vary.

We have excellent surgical techniques for forehead rejuvenation,¹²⁻³⁴ but the number of people on whom we operate is still limited. The most powerful refinement that we can make on these techniques is to make them less invasive. Techniques such as the limited incision foreheadplasty and the endoscopic forehead lift have increased the interest in forehead rejuvenation.^{12,35} Suture suspension technique has been widely used in plastic surgery. Suspension of the malar fat pad in midface rejuvenation, methods of canthopexy, and suspension of the midface to correct the deep nasolabial fold are frequently used examples of suture suspension.³⁶⁻⁴¹ This particular suspension technique,

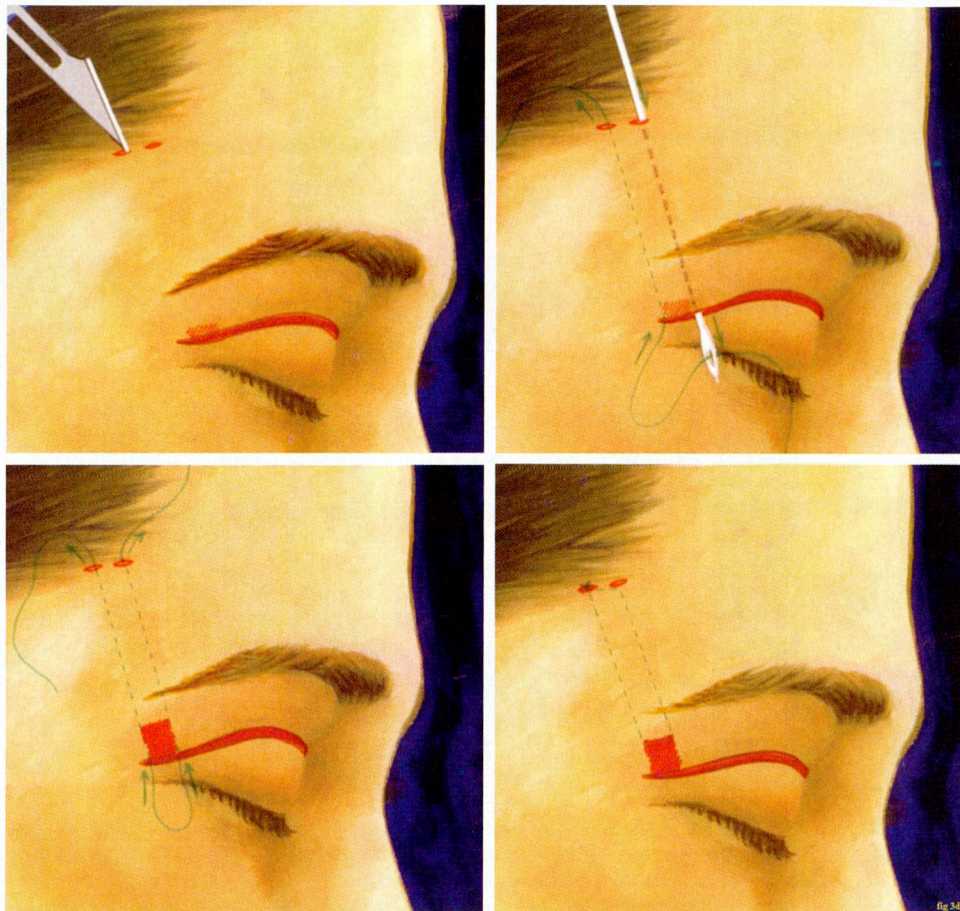


FIG. 4. Brow suspension can be done at the same time with an upper lid blepharoplasty. In this case, there is no need to make the stab incisions above the brow; the blepharoplasty incision can be used instead.

which was developed by the senior author to elevate the brow, has increased this interest among our patients significantly in the past 6 years.

The basis of this idea is the elimination of the pull of gravity. People have a “fresher” look when they are supine (Fig. 2), and this technique secures the brows at the position that they take when the patient is in a supine position. This procedure was initially used to complement forehead rejuvenation and to achieve a better lateral brow lift on patients with loose forehead skin.

This technique of brow suspension using only sutures has been a very useful method of elevating the brow when the patient is not interested in surgical brow lift (Fig. 5), but the technique is not limited to this group of patients. It can be combined with laser resurfacing and/or lipofilling and can also be done simultaneously with upper lid blepharoplasty to enhance the aesthetic result (Figs. 6 through 16).



FIG. 5. (Above) Preoperative frontal view. (Below) Postoperative view at 6 months. This patient had brow suspension only.

An important point to emphasize is that the anatomy of the lateral brow is different from that of the medial brow. This is nicely demon-



FIG. 6. (Above) Preoperative frontal view. (Below) Postoperative frontal view 1 month after brow suspension, upper blepharoplasty, and lipofilling.



FIG. 7. (Above) Preoperative frontal view of the patient. (Below) Postoperative frontal view 1 year after surgery. This patient had brow suspension with upper blepharoplasty and laser surgery.

strated with the anatomic study conducted by Knize.³⁷ The lateral brow has less connection with the deep structures, and the skin is looser. For this reason, most forehead rejuvenation techniques cannot achieve an adequate lateral brow elevation in certain patients. This is the group of patients in whom there is excessive loose skin around the lateral brow and few connections with the deep structures are attenuated. A bite of suture passed through the fibroadipose tissue in this area helps the suspension of lateral portion of the brow during the endoscopic or nonendoscopic forehead lift procedure. In this case, the blepharoplasty incision can be used instead of the two lower stab incisions and the blepharoplasty



FIG. 8. (Above) Preoperative frontal view. (Below) Postoperative frontal view of the patient 1 month after brow suspension. This patient was not pleased with the left medial portion of her brow following an endoscopic brow lift, so the suspension technique was used to achieve symmetry.

results can be complemented with the slight elevation of the brows.

Brow suspension technique is also effective to correct some of the brow asymmetries secondary to surgical brow lift. Some patients have very loose forehead skin, and it is very difficult to achieve a nice lateral brow elevation regardless of what technique of foreheadplasty is used. In this situation, if foreheadplasty is combined with brow suspension, then good results can be achieved.

CONCLUSIONS

The senior author has used this technique for the past 6 years. Not only has it been a highly accepted procedure of brow elevation for the patients who are not interested in surgical rejuvenation, but it has also been a very useful method in enhancing the aesthetic results when combined with lipofilling and laser resurfacing and endoscopic brow lift or to correct postsurgical brow asymmetries.

Brow suspension is a simple, safe, minimally invasive, and effective method of brow elevation, which has been a useful technique in various indications. The operation takes approximately 15 minutes and can be done under straight local anesthesia in most office settings. The simplicity of the procedure makes the revisions and/or the repetition of the procedure very easy. Furthermore, patients who do not want an invasive surgical procedure more easily accept it. Despite its acceptance



FIG. 9. (*Left*) Preoperative right oblique view. (*Right*) Postoperative right oblique view at 1 month.



FIG. 10. (*Left*) Preoperative right lateral view. (*Right*) Postoperative right lateral view at 1 year.



FIG. 11. (Left) Preoperative frontal view. (Right) Postoperative frontal view at 2 years. This patient had one brow suspension 3 years ago, but she wanted a more dramatic look, another one was performed 2 years later during laser and lipofilling procedures.



FIG. 12. (Left) Preoperative left oblique view. (Right) Postoperative left oblique view at 2 years.



FIG. 13. (Above, left) Preoperative frontal view of the patient. (Above, right) Postoperative frontal view 1 year after having brow suspension along with upper blepharoplasty, lipofilling, and erbium laser. (Below, left) Preoperative left lateral view. (Below, right) Postoperative left lateral view.



FIG. 14. (Above, left) Preoperative frontal view. This patient had a face lift 6 years before having a brow lift. The brows were asymmetrical after her face lift; therefore, brow suspension was used to correct the brow on the right side. (Above, right) Postoperative frontal view 6 months after brow suspension. This brow lift was done with CO₂ and erbium laser procedures. (Below, left) Preoperative right lateral view of the patient. Again, this is 6 years after a face lift but 6 months after brow suspension. (Below, right) Postoperative right lateral view 6 months after brow lift and laser procedures.



FIG. 15. (Above, left) Preoperative frontal view. (Above, right) Postoperative frontal view after 1 year. (Below, left) Preoperative lateral view. (Below, right) Postoperative lateral view. This patient had lipofilling and brow suspension.



FIG. 16. (Above, left) Preoperative frontal view of Dr. Onur Erol, the senior author of the article, who developed this technique. (Above, center) Postoperative frontal view at 2.5 years. This brow suspension was done with a blepharoplasty. (Above, right) Postoperative frontal view at 3 years. (Below, right) Preoperative left lateral view. (Below, center) Postoperative left lateral view at 2.5 years. (Below, left) Postoperative left lateral view at 3 years.

and ease, it is not a replacement for the established techniques of forehead rejuvenation.

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