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RESEARCH ARTICLE

Surgical Decision-Making and Technique for Direct Brow Lifting

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ABSTRACT

Objective: To discuss indications for direct brow lifting, patient selection, aesthetic considerations, and the risks of surgery in the context of the author's preferred technique.

Design: Review of literature and description of surgical decision-making and technique.

Conclusions: Direct brow lifting is effective and in some instances is the preferred aesthetic procedure for brow lifting. With a careful, honest discussion about risks, benefits, and alternatives to direct brow lifting, patients generally have excellent surgical and aesthetic outcomes.

Surgical decision-making and technique for direct brow lifting.

Direct brow lifting is the most powerful technique for lifting the brow and has the greatest degree of control over brow contour of any commonly performed brow procedure. The procedure has been performed for at least one hundred years¹ and modern advances in the surgical technique for this procedure are subtle. Direct brow lifting can be useful in improving vision due to brow ptosis or dermatochalasis, in lieu of, or complementary to, upper blepharoplasty.

In certain instances, direct brow lifting is also the preferred cosmetic procedure for elevating the brow. The decision to perform direct brow lifting for cosmetic indications is often clinical, but it is often a pragmatic decision based on the reduced level of invasiveness of the procedure and reduced cost relative to other forms of brow lifting. In either case, a careful discussion of risk and postoperative expectations is critical.

Patient selection for direct brow lifting

With proper patient selection, the direct brow procedure has very high patient satisfaction. Not surprisingly, the direct brow lift is effective, having the greatest degree of lift per millimeter of

tissue excised while affording excellent brow contour control.² There are many scenarios in which the advantages of the procedure significantly outweigh the potential for unsightly scarring. Nevertheless, a discussion with patients about direct brow lifting invariably starts with a description of incisional scarring, potential need for scar camouflage, and potential need for scar revision.

Beyond financial and clinical indications, there are several indications for direct brow lifting that make it the best *aesthetic* procedure for certain patients. Men with thick brow cilia are ideal patients for this procedure, due to the effective camouflage of the scarring directly above the brow (Figure 1). Patients with deep forehead rhytids just above the brow also do well with the incisional scar, whether the scar is placed directly in the supraciliary line or whether it is vertically displaced somewhat to take advantage of preexisting wrinkle lines (Figure 2). Women with sharply demarcated brow tattooing are excellent candidates for direct brow lifting. The incision along the superior border of the tattoo heals in an essentially invisible manner, and the presence of the tattoo makes the postoperative healing of the incision very tolerable (Figure 3).



Figure 1a & 1b

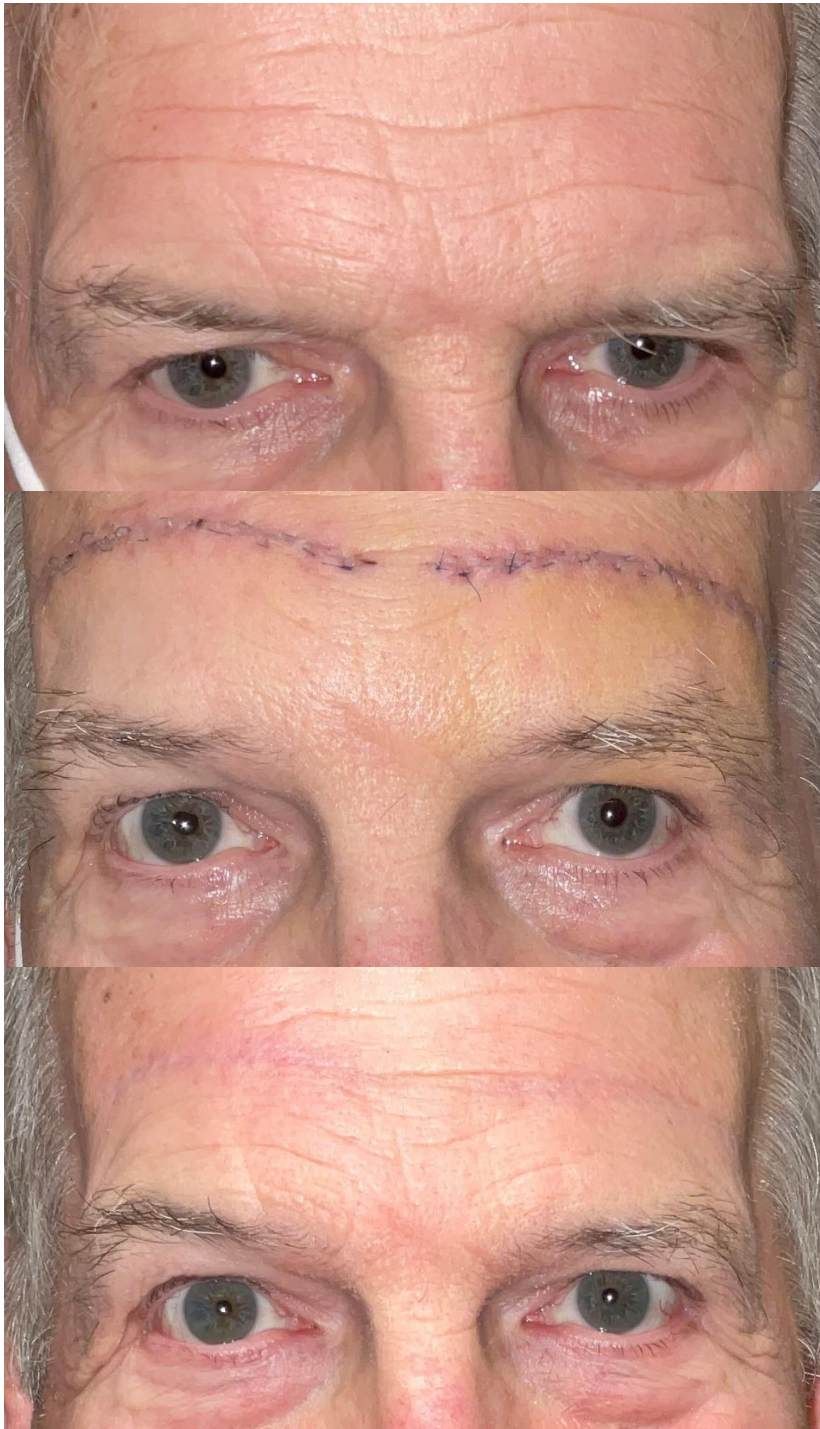


Figure 2a, 2b, 2c



Figure 3a, 3b, 3c

Patients with focal brow contour abnormalities are best treated with direct brow lifting, as this is the technique with the best control over brow contour. This includes patients who manifest only temporal brow droop (Figure 4). The thin skin of the temporal brow generally heals in a much more predictable manner than the thicker, more sebaceous skin of the medial brow and

glabellar region, and direct temporal lifting can be offered to a wider range of patients without being overly fearful about scar appearance. Finally, direct brow lifting should be strongly considered for those with high hairlines or domed foreheads, as the risk of unsightly hairline recession from endoscopic brow lifting may be significant.



Figure 4a, 4b

Other patients that are ideal for direct brow lifting are those with a history of failed endoscopic brow lifting, those with significant facial trauma with forehead scarring or plating, and those with paralysis of the facial nerve.

Further, from a pragmatic standpoint, direct brow lifting can be performed in the office and requires no special equipment beyond standard surgical setup. This limits the duration and intensity of the procedure, as well as the cost of the procedure. Additionally, for this procedure, the cost may be completely or partially offset by insurance coverage.

Risks of direct brow lifting

The most significant risk of direct brow lifting is an objectionable scar, and it is critical that this be discussed in detail with patients prior to undertaking this procedure. A meaningful clinical discussion includes numerous clinical photos of surgical incisions and their healing. It is also helpful to draw the resultant incisional scar on the patient with a makeup pencil and to photograph that for record-keeping purposes. Patients should be counseled that incisions in the thick, sebaceous skin of the medial brow can take many months to heal. Occasionally these incisions take more than 6 months to reach their endpoint.

Other risks include forehead hypoesthesia due to disruption of the supraorbital bundle and weakness of brow elevation due to disruption of the

temporal branch of the facial nerve. The supraorbital nerve generally gives rise to a superficial medial branch which pierces the frontalis muscle at several positions between brow and mid-forehead.³ However, the dissection plane for the medial and central aspects of the direct brow lift need not be deeper than the deep dermis, which is safely superficial to the supraorbital bundle.

The temporal branch of the facial nerve is located in the vicinity of the lateral orbital rim, crossing over the anterior branch of the superficial temporal artery at a position about 2cm from the lateral orbital rim.⁴ However, the temporal branch lies deep to the temporoparietal fascia, while the dissection plane adopted temporally for direct brow lift is barely sub-dermal.

As with any brow lift procedure, the brows can settle postoperatively. Direct brow lifting is no different; revision is always a possibility.

Surgical planning

Brow contour is the single most important surgical consideration when planning direct brow lifting. Brow contour conveys the emotional state in our facial expressions. Brow height is the second most important consideration. The appropriate level of aggressiveness is also important, to avoid limiting eyelid closure in the multi-operated patient who may have a shortage of eyelid skin. Finally, construction of the incisional scar is the final consideration.

Planning the incision

Many unfavorable outcomes from direct brow lifting occur because the surgeon does not achieve the desired brow shape. This is likely due to desire of the operating surgeon to construct the least conspicuous incision possible. However, the even most favorable incision cannot possibly overcome the aesthetic failure of an improper brow shape. Brow shape is the single most important consideration.

Most, but not all, individuals undergoing direct brow lift need elevation of the medial brow. The most common conceptual error in direct brow lifting is to limit the aggressiveness of the lift over the medial brow. An incision that is constructed to taper to a point above the medial aspect of the brow will, by definition, *undertreat* the lift of this segment of the brow. A procedure that undertreats

a ptotic medial brow will result in a brow shape that is odd, or perhaps sinister, as it angles downward unnaturally toward the glabella. To reiterate: a flat brow treated with a medially tapered incision will turn into a sinister brow.

The most effective way to lift the medial brow, without extending the incision into the glabella, is to include a medial M-plasty in the surgical plan. The M-plasty greatly increases the lift over the medial brow. It does come at the expense of the small additional limb of the incision, when closed, and the risk of a pin-cushioning type defect medially (Figure 5). The M-plasty can also be employed to transform a sinister brow configuration into a more neutral configuration (Figure 6). This same M-plasty can be utilized at the lateral aspect of the brow lift as well, to limit the lateral extent of the incision.

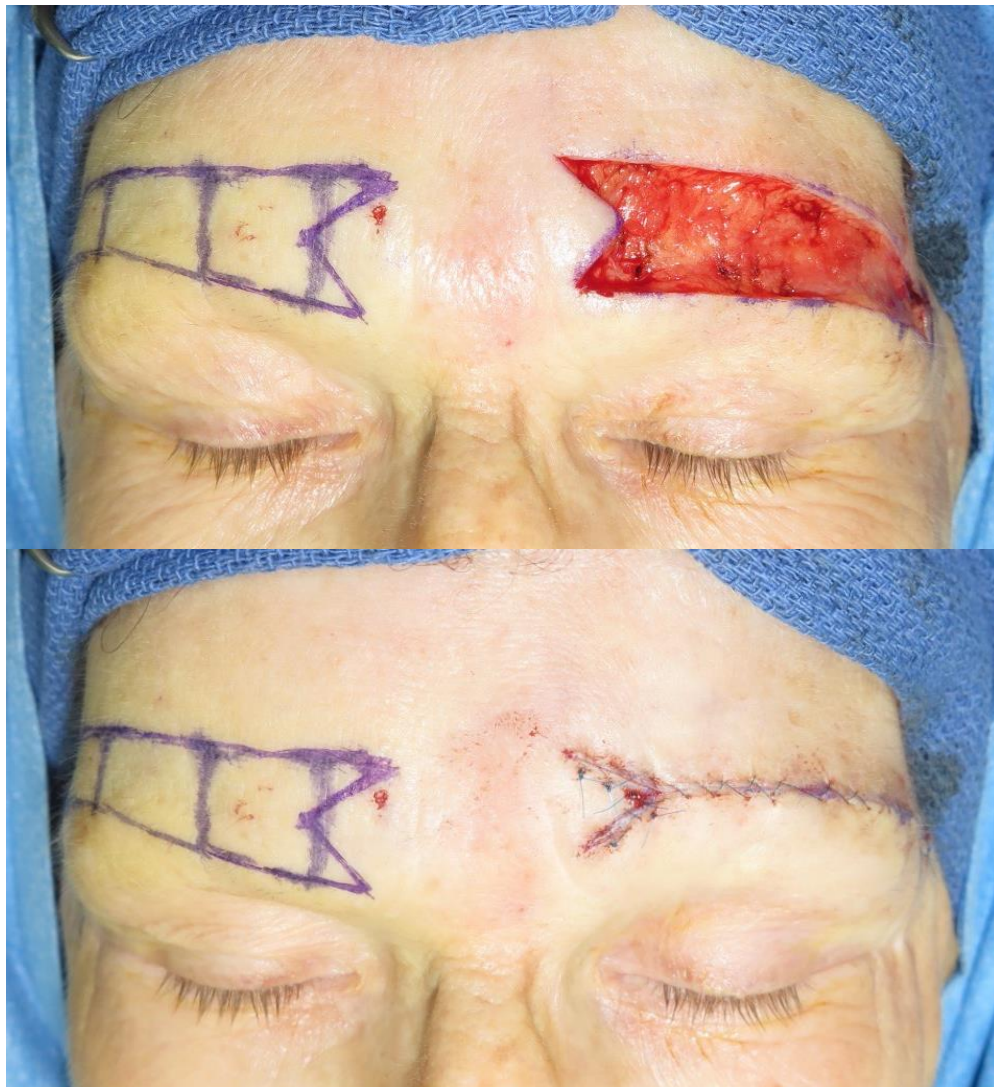


Figure 5a, 5b



Figure 6a, 6b

Marking the incision

The preoperative marking of reference points for the direct lift is performed with the patient in the upright seated position. The brow is manually elevated by the surgeon to the desired position, and a marking pen is placed at the top of the brow cilia at this maximal point of elevation. The brow is then depressed to its full extent manually while keeping the marker in contact with the skin – this traces the vertical extent of the excision required to achieve the desired elevation of the brow at that single position. This process, similar to that

described by Booth et al.², is then repeated at several positions along the horizontal extent of the brow, mapping the height of the excision and developing the desired brow contour (Figure 7). Certainly, there are many papers that describe the “ideal” brow shapes for patients^{5,6,7}, but in general a determination of the individual’s desired brow shape can be left to the patient. The surgical marking for direct brow can be easily reviewed and modified directly with the patient prior to the incision as part of the surgical decision-making process.



Figure 7a, 7b

It is likewise useful to mark the position of the scar directly above the brow cilia in the seated position as well. With intense surgical light in the supine position, the incision may accidentally be marked 1-2 mm higher than one would mark in the upright position with standard overhead lighting. The smooth contour and fine detail of the superior margin of the excision can be marked in the operating room in the supine position and simply amounts to "connecting the dots" from the prior reference lines. Finally, it is important to err slightly on the side of over-excision, as the brow will settle after surgery. In practice, this means planning to excise along the outer border of the superior brow marking.

Surgical technique

Local anesthetic injections tend to be more painful in the central and medial brow than those performed in the upper or lower eyelids. For this reason, it is helpful to either treat patients with prolonged topical anesthetic or intravenous sedation prior to injection.

The incision is performed with a 15 blade. Monopolar cautery is then used to help define the depth of the incision, effectively tracing the path of the 15 blade. Care is taken to bias the cautery pencil towards the segment of tissue that is being removed, so as not to thermally damage the tissue that will remain. Monopolar cautery does not extend deeper than the mid dermal plane, especially medially⁸.

There is some thought that beveling the incision in a manner parallel to hair follicles will create a hair-sparing incision, hence optimizing the appearance of the surgical scar. In practice, I find this to be cumbersome, exchanging this potential benefit for an irregular closure that is difficult to evert uniformly. For this reason, vertical incisions are preferred by the author. Given that the dissection plan adopted is intradermal for the medial two-thirds of the direct brow lift excision, it

is not meaningful to talk about beveling incisions to aid wound eversion, which some authors also feel strongly about.⁹ There is also some thought that performing a sawtooth patterned skin excision will break up the scar and make it less noticeable. This approach also creates difficulties in achieving a precise closure and is not the author's preferred method either.

The depth of tissue removal is important, and this author develops a deep dermal plane using monopolar cautery to maintain a uniform depth. Sensory abnormalities do not occur postoperatively when maintaining this dissection plane, unlike in other reported series.^{2,10}

Maintenance of an intradermal plane may reduce risk of a depressed surgical scar. The inferior and superior borders are then undermined for 2-3 millimeters. It is important to undermine the inferior border at a level just beneath the brow hair follicles (so as not to damage them), but not so deep as to encounter neurovascular structures (deep to the subcutaneous plane). The superior border is undermined at a similar depth. Deep closure is performed with buried 4-0 vicryl, and the skin is closed with interrupted and running horizontal mattress 6-0 prolene. These sutures can be removed on days 4-8.

Postoperative care

A silicone scar gel with SPF is recommended twice daily for several months after suture removal. Postoperative visits are typically at one week and two months and then as needed.

Conclusion

Direct brow lifting is a procedure with very high satisfaction. Patient selection is critical, as is a clear, frank preoperative discussion of incision placement and potential for unfavorable scarring. With proper patient selection and a careful, honest discussion, patients generally have excellent outcomes.

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