Subcutaneous forehead lift: A technical alternative for upper facial rejuvenation

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MH Wojtanowski. The subcutaneous forehead lift: A technical alternative for upper facial rejuvenation. Can J Plast Surg 1993;1(3):116-122. The subcutaneous forehead lift, using either the anterior or modified anterior approach, is reviewed. The advantages of this technique far outweigh the disadvantages. In selected cases, the subcutaneous approach should be considered as an alternative approach to brow ptosis in patients with a significant history of medical alopecia, those with thin, brittle hair, extensive forehead rhytides, brow asymmetry, and those with a long forehead and a high anterior hairline. Incorporation of this technique into the surgical armamentarium will allow for a more individualized approach to periorbital rejuvenation. Although the subgaleal coronal approach is acceptable in the majority of patients, there are limitations in selected patients.

Key Words: Subcutaneous forehead lift, Upper facial rejuvenation

Redrapage sous-cutané au niveau du front : technique alternative de rajeunissement du haut du visage

RÉSUMÉ : Le redrapage sous-cutané au niveau du front à l’aide des approches antérieure ou antérieure modifiée est passé en revue. Les avantages de cette technique en surpasse largement les inconvénients. Dans certains cas choisis, l’approche sous-cutanée doit être envisagée comme solution de rechange pour la ptose du sourcil chez des patients qui présentent des antécédents avérés d’alopecie médicale, chez ceux qui ont une pilosité fragile, une rhytidoïse au niveau du front, une asymétrie des sourcils et chez ceux qui ont un front long et dont la naissance de la chevelure est haute. L’ajout de cette intervention à l’arsenal des techniques chirurgicales permettra une approche plus individualisée pour le rajeunissement péri-orbitaire. Bien que l’approche coronale subgaleale soit acceptable chez la majorité des patients, elle présente des limites chez certains.

Although the majority of patients are candidates for the standard, post-hairline, subgaleal bicoronal forehead lift, selected patients require technical alternatives, the most useful of which is the anterior, or modified anterior, subcutaneous forehead lift.

In those patients with marked brow ptosis, extensive forehead rhytides, significant brow asymmetry, or a high forehead and high anterior hairline, the anterior subcutaneous forehead lift achieves optimal results.

The advantages and disadvantages of this technique are reviewed in detail, including technical nuances which will aid in achieving consistent aesthetic results.

A review of over 60 patients who have undergone this procedure since 1988 reveals minimal complications, including three patients with temporary alopecia and one with a superficial epithelial blistering, secondary to smoking. This is a safe, efficacious and effective aesthetic procedure which should be included in the armamentarium of aesthetic plastic surgeons.

The last decade has seen a significant increase in the type and amount of facial aesthetic surgery, with a focus at meetings and in the literature on the cheeks, neck and eyelids. Only in the recent past has the focus expanded to include aesthetic surgery of the forehead. Periorbital rejuvenation, including modification of the forehead-brow complex, has further enhanced aesthetic surgery results (1-7).

In order to achieve periorbital rejuvenation through forehead surgery, the surgeon must have a thorough understanding of periorbital aesthetics and knowledge of the various techniques of forehead lifting. These various techniques should all be mastered in order to maximize the surgeon’s versatility.

The majority of cases can be handled with the commonly used bicoronal subgaleal approach. In selected cases, however, the anterior or modified anterior subcutaneous approach should be considered. The anterior approach is a totally pre-hairline approach, including the temple and sideburn, while the modified anterior approach allows the temporal portion of the incision to be placed behind the hairline.

This technique has been minimized in the plastic surgical literature (8-11). Only one textbook reference, published in 1973 by Rees (12) considers that the technique “carries a significantly high incidence of complications”, but fails to delineate these complications. This increased complication...
rate has not been substantiated by either the literature or my personal experience.

More recently, several literary discussions have reviewed variations of the subcutaneous forehead lift and have repeatedly demonstrated the efficacy and safety of this technique (8-11,13). The acceptability of the anterior hairline scar is reviewed by Guyuron (8,9) and Connell (1,14). Negative reports about this technique have mostly been anecdotal (4).

**INDICATIONS**

The indications for the anterior or modified anterior subcutaneous forehead lift include: marked ptosis of the forehead skin, glabellar region and brows; extensive forehead wrinkling, including prominent transverse creases (8) and glabellar furrows (8); thin hair or a history of medical alopecia (10); and marked brow asymmetry (15).

The primary indication for this technique, however, is the
presence of a long forehead with a high frontal hairline. McKinney and co-authors recommended this approach in cases where a brow-to-hairline distance is greater than 5 cm when measured from the mid-pupillary brow to the anterior hairline (Figure 1) (16).

This approach can also be considered in patients who have had previous post-hairline subgaleal forehead lifts and have recurrent ptosis. The anterior approach would maintain a blood supply to the previously operated areas, while allowing for correction of recurrent ptosis and avoiding further posterior displacement of the anterior hairline.

One might also extend consideration of this technique to the ever increasing numbers of younger patients requiring a forehead lift. This group of patients will more than likely request repeat forehead surgery as the aging process continues, and the anterior approach will permit the secondary procedure without progressive lengthening of the forehead (10).

**TECHNIQUE**

The procedure is performed either separately or in conjunction with other facial aesthetic procedures. The order of procedures is somewhat controversial, but the author prefers to complete the forehead lift before marking and performing the upper lid blepharoplasty, to maximize aesthetic improvement and minimize the risk of upper lid incompetence.

The procedure is routinely performed on an outpatient basis under local anesthesia with intravenous sedation. One
percent xylocaine with adrenaline (1:100,000) anesthetizes the incision, while 0.5% xylocaine with adrenaline (1:200,000) is used in a direct and field-block manner. The adrenaline aids in precise hemostasis which is required to prevent hematoma and minimize visible ecchymoses, which can be prolonged in this thin forehead flap.

The incisions are marked with gentian violet approximately 2 to 3 mm posterior to the most anterior hairline, with just a few millimetres of hair shaving required (Figure 2). In the temple, where the hairline projects forward, the incision either follows the hairline anteriorly (Figure 3), or a modified approach can be employed in which the incision is placed posterior to the hairline in this area (Figure 4). The incision is made carefully, and changes direction throughout its course, paralleling all the hair follicles in an effort to achieve maximal hair growth in the peri-incisional area, and possibly even achieve hair growth through the incision by bevelling it.

The dissection begins with a scalpel and sharp scissors to transect the strong, fibrous septa of the frontalis muscle to the inner dermal surface. The bevelling of the incision, especially along the anterior hairline margin, is essential in achieving a smooth incision without evidence of contour irregularities. Flap elevation requires careful, even dissection to maintain a flap of appropriate thickness, approximately 3 to 5 mm (Figure 5). Any variation in flap thickness may result in a noticeable, uneven and corrugated appearance of the healed...
forehead flap. If a modified approach is taken, a deeper subcutaneous dissection below the hair follicles must be performed in the temple, otherwise spot alopecia could result. The amount of subcutaneous tissue varies with the individual. The supraorbital neurovascular structures are deep at the level of the supraorbital rim and lie on the surface of the frontalis muscle further superiorly, so one must be careful when beginning the dissection not to injure these. The flap should be elevated to the glabellar region centrally and to the supraorbital rims laterally to mobilize the brow adequately. The frontalis muscle and supraorbital neurovascular pedicles remain on the skull surface below which the frontal branch of the seventh nerve is protected from damage. Centrally, the corrugator and procerus muscles, which insert on the inner dermal surface, can be modified and/or resected by precise dissection through the medial portion of the obicularis occupi and the inferior medial portion of the frontalis muscle, which overlie the origins of these muscles. Because of the thinness of this anteriorly based flap, a visible depression may be noted after central muscle resection. If a concomitant blepharoplasty is performed, a fat graft from the lower lid can be contoured and placed in the muscle void to minimize the contour irregularity. Otherwise, a small piece of temporalis fascia will suffice. Simple detachment of the frontalis muscle from the fibrous attachments to the inner dermal surface of the flap improve the horizontal rhytides.

The inferior extent of the dissection should release the brow off the supraorbital rims. Once the flap has been ade-
quately mobilized and hemostasis complete, the flap is then draped posteriorly and appropriate redundant skin is resected. Figure 6 demonstrates that an anterior approach, in which there is a decided mechanical advantage, requires less tissue resection than a post-hairline subgaleal coronal approach, in which there is less of a mechanical advantage for the concomitant amount of brow ptosis. For every 1 cm of brow ptosis, a 1:1 resection is required anteriorly, whereas a 2:1 resection is required posteriorly to achieve the same amount of brow elevation.

Particular attention must be paid to the resection and closure. A layered, tension-free closure with meticulous tissue handling are essential for a satisfactory scar appearance. Subcutaneous closure is achieved with a 6-0 vicryl interrupted suture technique, while the anterior incision is carefully closed with a running 6-0 nylon interrupted suture, which is removed within 48 to 72 h postoperatively. A light, noncompressing sterile dressing is applied for approximately 24 h, and no drain is required.

RESULTS

The anterior or modified anterior subcutaneous forehead lift has been used in over 60 patients since 1988, when the author began to incorporate this technique. Fifty-four of these were performed with other facial aesthetic procedures, and six as an isolated procedure.

Potential complications such as hematoma, infection, flap necrosis and permanent alopecia did not occur in this series.
There were three cases of temporary alopecia and one case of a superficial epithelial blistering in a smoker, all four of which resolved spontaneously. Figure 7 demonstrates temporary total alopecia which resolved within three months with conservative therapy. Figure 8 shows a patient with an area of superficial epithelial blistering which healed spontaneously with a slight permanent discoloration of the skin.

The results have been otherwise satisfactory, with minimal morbidity and satisfactory aesthetic results as evidenced by consistent periorbital rejuvenation and improvement of facial rhytids (Figures 9, 10, 11).

DISCUSSION

The anterior, or modified anterior, subcutaneous forehead lift is an ideal technique in selected cases.

The advantages of this approach are numerous. With a subcutaneous plane of dissection, the supratrochlear and supraorbital neurovascular structures are not transected as in a subgaleal approach, minimizing sensory sequelae such as bothersome pruritis and prolonged or permanent numbness (17).

Rapid return of sensation is expected. The subcutaneous dissection also eliminates possible damage to the frontal branch of the facial nerve. The anteriorly placed incision prevents abnormal hairline elevation and lowers the anterior hairline, and is repeatable without hairline compromise. Because of the direct release of the brows, asymmetry is more readily corrected and transverse rhytides are markedly improved simply by detaching the fibrous septi from the frontalis muscle. Direct access to the corrugator and procerus muscles can be achieved centrally.

REFERENCES