Alopecia Prevention in Rhytidoplasty

One potential complication of rhytidoplasty is alopecia of the temporoparietal scars of the scalp. The authors propose a protocol for scalp closure as a complement to the use of a beveled incision in the direction of the hair follicles. (Aesthetic Surg J 2004;24: 379-383)

Alopecia resulting from rhytidoplasty is a frequent cause of dissatisfaction for the patient and frustration for the surgeon. Various methods designed to produce satisfactory results have been recommended, including the use of a zigzag incision, modification of the coronal incision, suturing of the galea, and suturing on the epidermal surface. These methods minimize and partially camouflage scars but do not prevent alopecia.

Material and Methods

We conducted a prospective study of 21 patients who underwent either primary or secondary rhytidectomy or supraauricular traction between January and May 2000 at the Clinica Morillas in Lima, Peru. The group comprised 20 women and 1 man ranging in age from 15 to 55 years. Fifteen patients underwent rhytidoplasty without a coronal incision, 1 underwent rhytidoplasty with a coronal incision, 4 underwent supraauricular traction, and one was treated for burn sequelae.

Surgery was usually performed with the use of general anesthesia, as well as infiltration with 2% lidocaine with epinephrine (1:200,000). A beveled incision was made with a no. 10 knife at an approximate angle of 30 degrees, in the direction of the hair follicles of the temporal region (Figure 1). The galea was closed with 3-0 absorbable suture (Figure 2). A second layer was closed with the use of a 5-0 nylon simple running suture punctuated with reinforcing knots every 3 or 4 cm. This technique leaves the follicle root intact (Figure 3), except for the initial 4-cm incision from the upper insertion of the auricular pavilion (ear), where we made a direct closure with the use of 4-0 nylon fiber and separate sutures (Figures 4 and 5). The sutures were partially removed on the fifth and eighth days after surgery and completely removed 12 days after surgery. Follow-up was carried out between 2 weeks and 6 months after surgery.

Results

The outcome was considered satisfactory if surgery resulted in a scar shorter than 1 mm and hair growth without alopecia, unsatisfactory if surgery resulted in a scar longer than 1 mm and alopecia in the cicatrical area. Excellent aesthetic results were observed in all 21 patients, with an almost imperceptible scar, no hair loss on the temporal region, and no other complications during postoperative follow-up (Figure 6). No patient reported a feeling of tightness in the temporal area, where the traditional suture was placed. Patients were able to wash their hair quite soon after surgery (before 5 days had elapsed). In our first 2 patients, alopecia developed in a very narrow area (~4 cm) at the upper insertion of the auricular pavilion, where we performed direct closure using separate sutures of 4-0 nylon. We believe alopecia developed because the galea is very thin in this area, making identification of the appropriate plane difficult.

We also achieved a satisfactory result in the patient with burn sequelae and alopecic areas. In this case, the rotation of the flap not only covered such areas but also followed the hair-growth pattern and lent a natural aspect to the final result. This patient experienced no tightness in the area adjacent to the suture.

Discussion

The scalp comprises the skin, subcutaneous cellular tissue, aponeurotic muscle plane (commonly called the galea), areolar tissue (subgaleal fascia), and pericranium (Figure 7). The skin and the galea are closely connected
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by various fibrous septa, similar to the palms and soles, so that when the galea moves, the skin and the fat also move. The galea is a dense, bright lamina of fibrous tissue. Its composition in the temporal region is different from that of the other scalp regions, comprising skin, subcutaneous cellular tissue, temporoparietal fascia, areolar tissue (subgaleal fascia), temporal muscle, fascia, and periosteum. The temporoparietal fascia, or temporal and superficial fascia of the temporal region, is the lateral narrow extension of the galea, and it is less tight and more mobile than the galea of the vertex. The hair-follicle axis is usually vertical to the skin surface at the vertex and inclined in the temporal and occipital regions.

The most important complications of scalp incisions are

Figure 1. The incision should be made without damage to the hair follicle.

Figure 2. The galea suture ensures tight closure of the injury borders.

Figure 3. The follicle root should be left intact between the galea suture and the skin.
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Figure 4. Aponeurotic galea suture.

Figure 5. Completed suture.

Figure 6. Postoperative views of a 57-year old woman (A) 8 days, (B) 12 days, (C) 18 days, and (D) 21 days after rhytidoplasty without coronal incision.
hypertrophic scarring and alopecia, caused by tight sutures that damage the hair follicle and by the type of incision. Some authors suggest that the use of monopolar cautery is also a cause of alopecia, whereas an excessively tight flap and its closure in a single plane are the causes of the hypertrophic scar. We suggest that these complications are more frequent and notorious in the temporal region than in the vertex because the incision can more easily damage the hair follicles, given their inclined growth axis in the temporal region, and because the galea does not adhere strongly to the periosteum in this region.\(^3\)

Various techniques have been recommended to avoid excessive tightness and the consequent complications, including tissue expansion; suture of the flap, periosteum, and galea; and anchorage of the galea to the pericranial flap,\(^3,5\) complemented with a beveled incision in the direction of hair-follicle growth.\(^2\) However, Burm and Oh reported that the cicatricial line in these patients was widened 2 months after surgery.\(^5\)

The aforementioned techniques will not avoid excessive tightness and alopecia because the galea is located above the temporal muscle and does not adhere to the periosteum. Our proposal is to suture the galea as a means of relieving tension on the superficial layers to prevent alopecia. According to other authors,\(^3\) this technique does not relieve scalp tension sufficiently to prevent these complications. This conclusion is contrary to the results obtained in our study.

We do not use double sutures to loosen the galea, as Inaba did,\(^3\) nor do we use loosening incisions 2.5 cm to the flap margin. We believe that if the proper incision and scalp detachment are performed, it is not necessary to carry out other procedures. It should also be noted that Inaba reported the treatment of Asian patients, whose scalps tend to be tighter and thicker than those of the patients in our study.

Another interesting aspect of the technique is the type of sutures used. We used absorbable material to suture the galea and nonabsorbable material to suture the scalp. However, Ramirez\(^4\) and, later, Inaba\(^3\) reported that the use of nonabsorbable material to suture the galea is beneficial with respect to scar consolidation and prevention of dehiscence. Both investigators have stated that the absorbable suture cannot provide sufficient force for a sufficient period because of its early reabsorption. The nonabsorbable suture (nylon) is not palpable and does not cause a foreign-body reaction because the knots are located under the galea and the scalp skin. These interesting results could serve as the subject of discussion in future research.

References


Bibliography

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