Purpose: To describe the use of hyaluronic acid gel for upper eyelid filling, contouring, and rejuvenation.

Methods: In this consecutive, retrospective, interventional case series, a standard series of surgical procedures and preparations for preoperative placement of filler were administered at the superior orbital rim. Outcome measures included classification of upper eyelid volume deficiency as I) medial A-shaped hollow, II) generalized hollow, III) postblepharoplasty volume loss, and IV) upper eyelid hooding with subbrow volume deflation; volume of filler used; masked, independent assessment of pretreatment and post-treatment photographs; patient satisfaction; and complications.

Results: Twenty-seven patients were included with a mean follow-up of 13 months. More than 85% were white women with a mean age of 51 years (range, 24–65 years). Five patients were classified as type I, 8 as type II, 11 as type III, and 3 as type IV. The mean volume of filler used was 0.4 ml/eyelid (range, 0.1–1 ml). Photographic assessment showed improved static upper eyelid contour in 23 patients (85%), little change in 3 patients (11%), and deterioration in 1 patient (4%). Twenty-six patients (96%) were satisfied with the treatment, although 5 (19%) requested additional filler and 1 patient underwent dissolution within 3 months. Two of the 3 type IV patients still required blepharoplasty/ptosis surgery. All patients developed mild bruising and swelling but no discoloration or lumpiness.

Conclusions: Hyaluronic acid filler is an effective means of rejuvenating the upper eyelid and is particularly successful in patients with medial/generalized upper eyelid hollowing, or significant postblepharoplasty upper eyelid show. A blepharoplasty/brow lift/ptosis procedure is still frequently required for hooing due to subbrow deflation (type IV).

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Injection Technique. The patient’s upper eyelid skin was numbed with ice and wiped with an alcohol swab. With the patient supine and the eyes in downgaze, a needle puncture was created close to the junction of the lateral wall and roof. The needle tip was advanced in the suborbicularis plane until it reached the inferior border of the superior orbital rim and 0.1 ml hyaluronic acid gel was injected preperiosteally. The needle was withdrawn, and the raised bleb was molded over the anterior aspect of the orbital rim in a medial direction to achieve a smooth contour. The patient was asked to look straight ahead and the upper eyelid contour inspected. This process was repeated 2 or 3 more times, using a serial puncture technique, with each injection progressively more medial. The supraorbital notch was avoided to minimize trauma to the supraorbital neurovascular complex. After the injections, the patient was asked to raise the eyebrows, and the filler was molded onto the anterior surface of the orbital rim. With the brows relaxed, the upper eyelid contour was reassessed to evaluate any residual lumpiness or irregularity. Injection end points included symmetrical fullness of the preseptal skinfold and softening of any hollows.

Patients were advised to avoid exercise and alcohol for 24 hours and direct pressure on the upper eyelid region area for 72 hours. Regular ice packs and analgesia were recommended. No routine postoperative visit was scheduled, but all patients underwent a telephone review the following day. Prompt follow-up was arranged if concerns were apparent.

Data Collection and Outcome Measures. The type of upper eyelid volume deficiency was classified in one of the following 4 groups: I) medial A-shaped hollow (often misinterpreted as lateral brow ptosis); II) generalized hollow; III) postblepharoplasty generalized volume loss with no skin excess; and IV) upper eyelid hooding with subbrow deflation. Detailed examples of all of these types of upper eyelid volume loss are shown in Figure 1. All patients had pretreatment and posttreatment clinical photographs on file, taken with standard positioning and lighting at each visit. The appearance of the upper eyelid/brow complex on these photographs was reviewed independently by a clinician who was masked to the treatment used and to the patient satisfaction score. If more than one treatment was given within the first 3 months, the final photograph was used as the posttreatment comparison. The appearance of the upper eyelid/brow complex posttreatment was graded on a subjective scale of −1 (worse), 0 (no change), and 1 (improved). Patient satisfaction with the procedure was based on patient feedback from the final consultation.

RESULTS

In total, 27 patients received upper eyelid hyaluronic acid gel, with a mean follow-up of 13 months. Of these, 24 were women and 3 (85%) were white. Their mean age was 51 years (range, 24–65 years). One patient had Parry-Romberg syndrome, but in the others, the etiology was age-related or postblepharoplasty. In all cases, this was the patient’s first treatment with upper eyelid/brow filler. Five patients were classified as type I (medial A-shaped hollow), 8 as type II (generalized hollow), 11 as type III (postblepharoplasty generalized volume loss with no skin excess), and 3 as type IV (upper eyelid hooding with subbrow deflation).

The mean volume of hyaluronic acid gel injected per eye was 0.4 ml (range, 0.1–1 ml). All patients developed some bruising and swelling within 24 hours of administration of the filler, which persisted for no more than 5 days and was readily managed with the use of concealer or sunglasses. No patients developed blue discoloration or irregular lumpiness at the site of injection of the filler, unlike in similar series documenting tear-trough contouring. However, the filler was visible in 2 patients on marked brow elevation.

Five patients (19%) requested additional treatment with hyaluronic acid gel to the upper eyelid, and one patient underwent dissolution of the gel with hyaluronidase within the first 3 months of treatment. The latter was because of concerns that her appearance had altered too much, despite having an objectively satisfactory result on...
clinical and masked photographic assessment. However, she remained satisfied with the overall procedure.

Two of the 3 type IV patients had minimal change and went on to have ptosis/blepharoplasty surgery. Both eventually had a good outcome although one required a revision blepharoplasty procedure and developed marked, acute bilateral upper eyelid swelling 1 month postoperatively that was centered around the area treated with hyaluronic acid filler 6 months earlier. Both upper eyelids were injected with hyaluronidase, after which the swelling rapidly settled. No additional risk factors were identified that could have contributed to this complication except for the patient’s regular use of swimming goggles over the treated area.

Independent, masked assessment of photographs revealed that 23 patients (85%) had improvement, 3 (11%) had little change, and 1 (4%) had deterioration in static upper eyelid fold contour. Overall, 26 of 27 patients (96%) were satisfied with the treatment. The only patient to express dissatisfaction with the upper eyelid nonanimal, stabilized, hyaluronic acid contouring was the other type IV patient who required a ptosis/blepharoplasty procedure. She did not request hyaluronidase and was satisfied with her surgical treatment.

DISCUSSION

The oculofacial literature has shown recent concerns about the traditional excisional or “lifting” approach to periocular rejuvenation. Although such surgery in the upper eyelid area certainly improves the brow ptosis and dermatochalasis that develops with aging, it does not address the fundamental loss of soft-tissue volume that contributes to these aging changes. Consequently, such techniques often change a patient’s appearance and can paradoxically serve to age a patient further. For example, brow lifts can result in inappropriate elevation of the brow, which lengthens the orbital distance (the distance from the brow to the nasojugal fold) and emphasizes the superior orbital rim. This contrasts with the youthful eye, which actually has a relatively short orbital distance with low brows and a full supraorbital rim. A similar effect is seen in traditional excisional upper eyelid blepharoplasty where the orbit is often skeletonized. Such effects age the eye by making it appear smaller, with the focus falling on the superior eyelid sulcus. However, the simultaneous lack of hoolding or dermatochalasis following surgery produces a conflicting picture and can yield an unnatural appearance.

Hyaluronic acid gel fillers offer a versatile and safe method of replacing soft tissue lost from the upper eyelid/brow complex. Unlike autologous fat transfers they have no associated donor site morbidity, no risk of graft hypertrophy, the ability to be performed in the office, the ability to be molded, the potential for complete reversibility, and minimal risk of lumpsiness, bruising, or infection. Hyaluronic acid gels have already been used successfully in both facial and lower eyelid rejuvenation and have proved popular with patients because of these properties, all of which have been manifested in our case series. If anything, the results we obtained with upper eyelid contouring actually exceeded those documented for the tear trough region, in terms of objective photographic improvement scores (85%), patient satisfaction scores (96%), and by the lack of any reported lumpiness or blue discoloration. These results suggest that the greatest challenge in upper eyelid volume loss is to be helpful in identifying patients that were best suited to hyaluronic acid gel contouring and for planning their treatment. The first 3 categories involve situations of upper eyelid hollowing where there is a reasonable brow position and minimal dermatochalasis. This can be due to age-related or pathologic factors (types I and II) or following blepharoplasty surgery (type III). Such patients represented most of those treated in our series (89%), and all were satisfied with their treatment outcomes. In particular, type II patients (generalized upper eyelid hollowing and type III patients (subbrow ptosis without skin excess) did very well, with objective photographic improvement in all cases. Although all of the type I patients in our series were satisfied with the treatment, 2 (40%) had no objective improvement on photographic assessment, highlighting the increased technical difficulty of medial filling and molding due to the presence of the supraorbital neurovascular bundle in that area. In addition, one type I patient did not like the alteration in her upper eyelid contour despite objectively successful treatment. This latter case emphasizes the need for careful evaluation of old photographs, particularly in patients who have not had previous surgery, so as to ascertain their original degree of youthful upper eyelid fullness. Care must be taken not to deviate from the patient’s natural youthful contour unless it is specifically requested.

In contrast to the first 3 groups, type IV patients exhibited significant subbrow deflation with brow ptosis, dermatochalasis, and even blepharoptosis. These were the least common type of patients to be treated (11% of the total) but proved to be the most difficult. Although subbrow deflation is theoretically amenable to volume augmentation, we found that little change was noted in the upper eyelid/brow complex unless the brow displacement and dermatochalasis was mild. Consequently, 2 of the 3 patients (67%) in this group with more advanced subbrow deflation and hooading showed no objective photographic change with hyaluronic acid gel contouring and went on to have a blepharoplasty/ptosis procedure. Levator advancement can help to improve the upper eyelid hollowing in these cases by enhancing the anterior orbital volume and camouflaging the medial fat pad. One of these patients was the only patient to describe dissatisfaction with the upper eyelid filler treatment itself (4% of the total number of patients treated).

When treating patients who have one of the first 3 types of upper eyelid hollowing, the concept of “balanced upper
eyelid proportions” can be very helpful. This is formalized by the upper eyelid ratio, which compares the visible distance, in the primary position, between the eyelid margin and the upper eyelid skinfold (termed “pretarsal show”), with that between the skinfold and relaxed brow (termed “preseptal show”). The ratio is best used only for patients with reasonable brow position and eyelid height (i.e., hollowing types I to III) because significant brow displacement or blepharoptosis can confuse the measurements. In general, the upper eyelid ratio increases from medial to lateral within the upper eyelid (i.e., approaches 1:0). It also increases with age, due to a rising skinfold caused by volume loss in the eyelid and subbrow region. Furthermore, this increase may occur asymmetrically, as in type I medial hollowing. Balanced proportions between both medial and lateral ratios, and values in keeping with the patient’s youthful appearance should be considered the goal of any filler treatment. This is best obtained by careful comparison between the patient’s upper eyelid ratios determined from old photographs and their current measurements recorded in the office. The concept of the upper eyelid ratio and its alteration with age and hyaluronic acid filler treatment is illustrated in Figure 2.

In conclusion, current surgical approaches to upper eyelid and brow rejuvenation do not address the soft-tissue volume loss caused by aging and as such can lead to unnatural results. Such deflation can be effectively corrected with hyaluronic acid gel injections, particularly in patients with stable brows and without excessive dermatochalasis. However, care should be taken in patients with marked subbrow deflation or hooding where blepharoplasty/ptosis repair is frequently required. This can still be complemented with upper eyelid filling to create a more natural look by camouflaging the superior orbital rim, filling the superior sulcus, and reducing the upper eyelid ratio. The treatment is safe, well tolerated, titratable, reversible, and has a high patient satisfaction.

FIG. 2. Photographs illustrating the concept of the upper eyelid ratio and its alteration with age and hyaluronic acid filler treatment. A, A youthful upper eyelid (25 years) showing measurement of the upper eyelid ratio where (i) = pretarsal show and (ii) = preseptal show. B, The same eyelid showing a lateral ratio of 1:3 and a medial ratio of 1:1.5. C, An aged upper eyelid (45 years) with a lateral ratio of 1:2 and a medial ratio of 1:1. D, The same upper eyelid immediately posttreatment showing a lateral ratio of 1:3 and a medial ratio of 1:1.5. E, Another aged upper eyelid (38 years) with an overall upper eyelid ratio of 1:0.7. F, The same eyelid 4 months posttreatment showing an overall ratio of 1:1.5. G, A postblepharoplasty upper eyelid with a lateral ratio of 1:1 and a medial ratio of 1:0.5. H, The same eyelid 4 months posttreatment showing a lateral ratio of 1:1.5 and a medial ratio of 1:2.

REFERENCES

AUTHOR QUERIES

A—Please provide the academic degree for Raman Malhotra.
B—Please check whether the edited sentence “Data were collected on patient…” is OK.
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