

# Duckless Lips: How to Rejuvenate the Older Lip Naturally and Appropriately

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When injecting the lips, practitioners can make a variety of mistakes that leave patients looking like ducks, fish, or other weird creatures. Understanding the structure of the lips and perioral region as well as the resultant effects of the aging process is key, but maintaining the natural proportions of the face ultimately is most important. The practitioner's main priority should be to achieve a look that is appropriate for the patient's age, and he/she should be willing to adjust the injection technique according to the patient's needs. This article describes techniques for lip rejuvenation that will provide a natural duckless look, with a particular emphasis on treatment of the aging lips.

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When injecting the lips, there are a variety of mistakes practitioners can make that are not entirely their fault. We live in a society where patients now feel they know what they want well before they see a physician for diagnosis and management. A willful patient may present to a less willful or inexperienced practitioner wanting to look like a divined image of a friend or favorite celebrity, even if that person is younger than the patient and even if the age, shape, and dynamics of the lips are entirely different. The practitioner also may impose an aesthetic that does not suit the patient's face because that is the practitioner's aesthetic or how he/she has been taught to inject the lips. It is important that practitioners do not become the patient's technical paintbrush and are able to fully and

adequately assess the patient, the perioral area, and the lips to ensure that satisfaction reigns supreme.

Some common errors that tend to make patients look like ducks include the following: (1) treating the vermilion only (ie, the red part of the lips), particularly in older patients; (2) placing too much product in the center of the lips; (3) failing to achieve balance by overinjecting the upper versus the lower lip, or vice versa; (4) placing product throughout the lips without paying attention to defining features, creating shapeless or "sausage" lips; (5) injecting too much filler in general; and (6) not retaining balance with the surrounding structures in the perioral area or the face in general. All of these errors look worse and more discordant in aging lips, but they can be fixed by better understanding.

## A'S OF LIP REJUVENATION Aesthetics

Beauty drives all reconstructive and aesthetic thought in treatment. Attaining or approaching beauty gives us something to aim for and is our source of natural balance—a gestalt—that is achieved when the proportions of the face and lips are correct.

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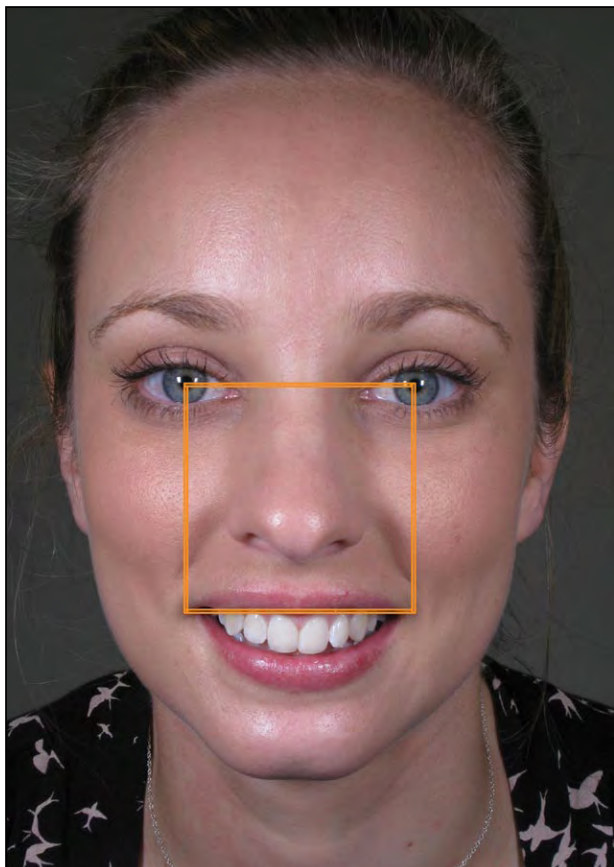
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There are a variety of lip shapes that reflect different ethnicities and genders, and a specific look of the lips may be considered fashionable in a certain era.<sup>1,2</sup> Regardless of these caveats, however, the basic aesthetics of the lips are fairly set in stone.

Facial proportions are important in our appreciation of beauty.<sup>3</sup> Symmetry of the upper lip is extremely important, and it is never acceptable for the lip to look different on one side versus the other.

The aesthetics of the perioral region are important but should be kept in balance with the rest of the face considering that the mouth, even when smiling, receives less than 10% of visual attention.<sup>4</sup> Beautiful lips certainly are ideal. It can be beneficial to improve or enhance attractive facial features, but they must be kept within proportion to the rest of the face. In general, the distance between the oral commissures should be equal to the interpupillary distance, and a perfect square should be formed when the ends of these lines are joined (Figure 1).<sup>5</sup> A line through the oral commissures should transect the lower third of the upper lip in the midline.



**Figure 1.** The distance between the oral commissures should be equal to the interpupillary distance, forming a perfect square when the ends of the lines are joined.

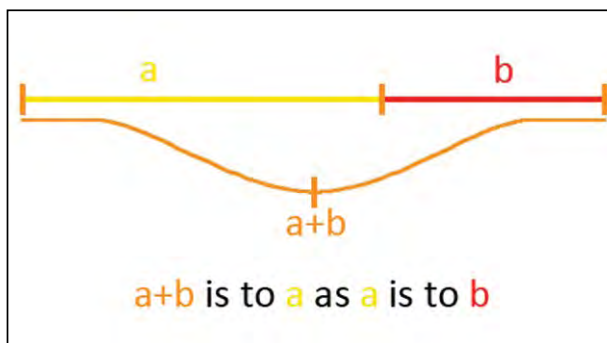
The well-known golden ratio, or divine proportion (phi), is relevant to the perioral area (Figure 2).<sup>5</sup> Vertical vermilion show in white women is in the phi proportion of 1 for the upper lip and 1.618 for the lower lip. Black and East Asian women may have dimensions approaching 1 to 1. The distance between the 2 philtral columns compared to the distance from 1 philtral column to the ipsilateral commissure on the respective side of the face also is a ratio of 1 to 1.618 on both sides. The shape of the Cupid's bow should be distinct with full philtral columns and a philtrum that is 10- to 11-mm wide. The philtral columns are angled 10° to 20° inward toward the columella.<sup>5</sup>

There are other mathematical aspects that dictate the appearance of beauty in the perioral region. Gingival show on repose should be 1 to 2 mm and the ideal width of beautiful lips should be 57 to 62 mm.<sup>6</sup> On lateral view, the upper lip should project 1 to 2 mm forward from the lower lip and the upper lip should fall 4 mm posterior to the nasomental line while the lower lip should fall 2 mm posterior to the nasomental line (Figure 3). Not obeying proportions of the lips and face can confuse onlookers and make the patient look silly in the eyes of anyone judging their facial appearance.

Symmetry has been suggested to be important in our appreciation of beauty and mate selection,<sup>7</sup> but not everyone believes that symmetry is important. For some, too much symmetry can look boring and unemotional.<sup>8</sup> When it comes to the lips, however, remember the aphorism that both sides of the face can look like sisters but the lips must look like twins.<sup>5</sup>

### Assessment

The static aspects of the lips and perioral area should be assessed, including the support structures at the corners of the mouth, the depressions that occur above the lateral upper lip, the definition of the vermilion



**Figure 2.** A diagram of the golden ratio. The ratio of line ab to segment a is 1.618 to 1. The ratio of segment a to segment b is 1.618 to 1 or 1 to 0.618.



**Figure 3.** Lateral view of the perioral region showing the upper lip projecting 2 mm forward from the lower lip, the upper lip positioned 2 mm posterior to the nasomental line, and the lower lip positioned 4 mm posterior to the nasomental line.

border, the philtral columns and Cupid's bow, the lateral projection of the upper lip, and the red vermilion rising up to a peak at each tip of the arch of the upper lip (the Glogau-Klein point).<sup>9</sup> On lateral view, there also are several lines that may be used to estimate lip alignment. The Burstone, Steiner, and Ricketts lines indicate the ideal relationship between the nose, upper and lower lips, and chin. The Steiner line is particularly useful and should touch the upper lip, lower lip, chin projection, and base of the columella.

Various grading scales have been introduced in recent years to evaluate the perioral region and the lips.<sup>10-14</sup> Part of the assessment of the lips and perioral area may involve the utilization of these scales to educate patients and determine achievable results in aging patients.

Adequate assessment of the lips involves educating the patient about the perioral region and explaining that the lips and the perioral region change over time. For instance, what looks natural in a 20-year-old patient does not necessarily look natural in a 60-year-old patient, and vice versa. One approach I have used involved the development of a set of scales describing the lower face and perioral region, namely the nasolabial folds, upper lip atrophy, lip volume, upper lip wrinkles (both at rest and on contraction), marionette lines and prejowl sulcus, and the jawline (Figure 4).<sup>14,15</sup> In the HOYS (home of younger skin) program, patients used these scales to engage in self-assessment to determine a skin age for this entire region; patients were asked to repeat the analysis at a later date to compare changes in estimated skin age. Patients

selected the sample image that most closely resembled their appearance before treatment. Software then was able to determine the estimated skin age for that region. After undergoing treatment, patients repeated the assessment, again choosing the image that looked most like them, and received a new skin age. This process allowed patients to view their improvement in their self-assessed skin age (Figure 5).<sup>14,15</sup>

Another important element of perioral assessment is the smile. There are a number of different types of smiles, including the Mona Lisa, canine, full denture, and gummy smiles, each with characteristics that apply to certain proportions of the population. No smile should be regarded as the gold standard, the one to aim for, but dynamism needs to be taken into account when assessing a patient.

This dynamism or perioral motion also needs to be assessed, including movement induced by the depressor muscles (depressor anguli oris and depressor labii inferioris), which induce the mouth frown, as well as the mentalis muscle, which is responsible for the appearance of a popply chin.

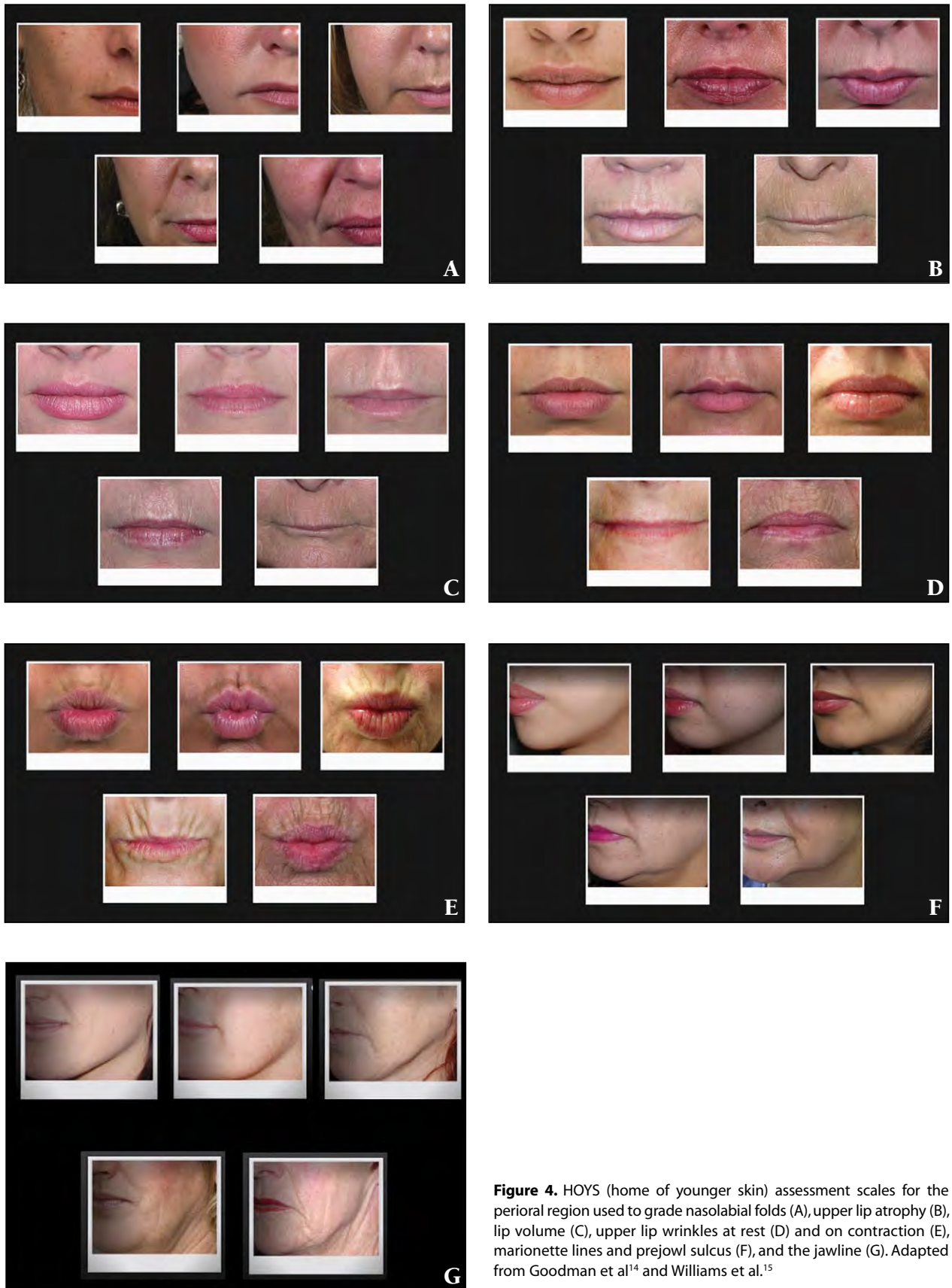
### Approach

Delineation of a successful treatment approach requires an understanding of aesthetics of the lip and accurate perioral assessment. Knowledge of the anatomy and aging process of the lower face also is important but is beyond the scope of this article.

The exact treatment approach will vary from patient to patient, as aging lips are not necessarily treated the same as youthful lips. It is important to note the results practitioners are aiming to achieve in older lips. We are not trying to create 25-year-old lips on a 55-year-old face, which would look inappropriate no matter how successful the procedure, as it is not consistent with the rest of the face. Therefore, it is more appropriate to aim for a decade of change in the lip, but the proportions of the rest of the face should be kept in mind (Figures 6 and 7).

When developing an approach for rejuvenating the lips, it is useful to consider movement, surface issues, and volume-directed treatments.

**Movement**—Movement should be assessed first, including movement related to the smile, the mouth frown, the chin puckering, and the kiss. Adjusting these actions with neurotoxins when needed is a good base to bring these aspects back into a neutral relaxed position. In other areas, it has been suggested that neurotoxins are synergistic with both resurfacing and volume treatments,<sup>16-18</sup> which probably is true for the perioral region. Comprehensive reviews of the use of neuromodulation and its combination with other agents in the lower face are available and should be studied.<sup>19,20</sup>



**Figure 4.** HOYS (home of younger skin) assessment scales for the perioral region used to grade nasolabial folds (A), upper lip atrophy (B), lip volume (C), upper lip wrinkles at rest (D) and on contraction (E), marionette lines and prejowl sulcus (F), and the jawline (G). Adapted from Goodman et al<sup>14</sup> and Williams et al.<sup>15</sup>



**Figure 5.** A female patient before (A) and after (B) botulinum toxin injections to the depressor anguli oris, mentalis, and orbicularis oris muscles, as well as hyaluronic acid filler injections in the nasolabial folds, lips (including lines and atrophy in the upper lip), marionette lines, and jawline. Patient self-assessment before and after treatment revealed a 15-year decrease in skin age of the lower face.



**Figure 6.** Age-appropriate improvement in the lips of a 25-year-old woman shown before (A) and after treatment (B).



**Figure 7.** Age-appropriate improvement in the lips of a 45-year-old woman shown before (A) and after treatment (B).

Employ a 3-step approach to movement in the perioral region. First, assess surrounding movement, particularly related to the depressor anguli oris, mentalis, and occasionally the depressor labii inferioris (if asymmetrical) muscles (Figure 8).

Second, assess the smile, including whether a gummy smile is present; whether the smile subtype is mainly lateral, central, or mixed; whether the smile is asymmetrical or if there is loss of lip show on smiling; or whether there is depression of the nose on smiling. A gummy smile may require injection of the levator labii superioris alaeque

nasi and orbicularis muscles if the smile subtype is central (Figure 9) or the zygomaticus muscles if the subtype is lateral, possibly more so the zygomaticus minor than major and the malaris muscle (a variable sheet of muscle that inserts into the orbicularis oris). A loss of lip show on smiling is well-treated with superficial injection of the orbicularis oris muscle, whereas a dipping nose on smiling requires injection of the depressor septi muscle at the base of the columella.

Third, assess active and passive rhytides. Rhytides that are present only when active (ie, kissing, pursing



**Figure 8.** A patient with scarring and line etching caused by constant muscular action of the lower face (A) showed improvement after treatment with botulinum toxin and hyaluronic acid (B).



**Figure 9.** A patient with a gummy smile who had intradermal filler injections to the orbicularis muscle and will undergo injection of the levator labii superioris alaeque nasi muscle.

of lips) but not at rest usually can be treated with neurotoxins with or without volume replacement; however, rhytides that are present on movement and rest may require a combination treatment of resurfacing, neurotoxins, and volume.

**Surface Issues**—Photodamage as well as the effects of smoking and recurrent perioral expressions may emboss static wrinkles that may be best addressed with a laser or other resurfacing modality, either ablative or fractional. Shrinkage of the skin caused by some techniques may have the concomitant effects of wrinkle reduction and improvement of surface texture but also may cause vertical upper cutaneous lip shrinkage leading to eversion of the lips. However, it is advisable to treat the entire subregion of the upper lip or the entire perioral region if using truly ablative techniques such as laser skin resurfacing, dermabrasion, or deep chemical peeling to avoid demarcation. This concern is somewhat less important with fractional resurfacing because this modality is less likely to cause demarcation. Fine multiple wrinkling may be well-treated with either fractional or nonfractional

ablative techniques, whereas more prominent wrinkling may still be in the province of fully ablative techniques.

**Volume**—Volume often is required and may follow attention to muscular movement, either preceding or following resurfacing procedures. A 5-step approach—dentition, angular support, upper lip projection, upper cutaneous lip, and lower lip volume—to volume in the vicinity of the lip is useful.

First, the teeth and bony architecture of the maxilla and mandible give lips their shape and volume. There are other elements that will deplete and atrophy with age, but the bony and dental framework are key. Prior to the procedure, the physician should study the patient's teeth, note missing teeth and/or poor dentition, and possibly call in dental and orthodontic colleagues if needed. More subtle changes such as loss of the bulk in the teeth and receding gums may add to the general loss of volume supporting the lips and also may be improved by dental aesthetic procedures.

Second, angular support of the mouth angles may involve injection of the upper marionette lines to raise and support the angles of the mouth. Depending on severity of the marionette lines/sulcus, the prejowl sulcus also may be involved and also may need to be involved in treatment. The general approach is to initially assess and attend to the support of the lip, including the cutaneous lip (both upper and lower) and possibly the mental crease and nasolabial folds if required to bring the lip back into balance. An older patient will require more perioral support than a younger patient, but if a patient has thin wizened lips at a young age, he/she also will require more support. Attention should be given to the submuscular (orbicularis oris) fat that atrophies with age; volume can be easily reinstated with filling agents, which will have the effect of everting the vermilion, literally dragging it out of the mouth, and of decreasing the perioral rhytides,

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especially in the upper lip. In the lateral lower lip, adding deep support may improve vermilion show and lessen the appearance of rhytides; medially, it may evert the central lip and limit the chin crease.

Third, it is important to look from the side of the patient. If the upper lip does not project 2 mm further forward from the lower lip, from the lateral aspect, it will look odd (Figure 3). It is best to achieve upper lip projection gradually by injecting the cutaneous lip centrally but lateral to the philtral columns and placing volume in and behind the philtral columns. It is not a good idea to deposit volume centrally to the mucosa unless it is definitely deficient or into the cutaneous lip between the philtral columns. Occasionally, in severe cases it may be required to inject volume into mucosa abutting the incisors to directly project the upper lip, simulating more dental volume.

Fourth, after support has been addressed, the next aspects are the individual features of the lip and to bring these back to prominence. The first features to be promoted are the Cupid's bow and philtral columns, which should be injected in most patients unless they previously did not have a visible Cupid's bow. A small injection of the Cupid's bow is useful to help structure the lip. The philtral columns should be injected medially and inferiorly at the top of the vermilion arches of the upper lip. Enhancement of the Glogau-Klein point at the intersection of the apex of the arch and philtral columns allows projection of the upper lip and the ski slope that sits so well on the younger lip. However, it should not be injected in isolation in an older lip or it will leave a telltale sign of injected lips. To avoid this unnatural appearance in an older lip, the support steps need to be addressed first. The second set of features of the lips that need to be addressed are the circumferential white and red rolls of the vermilion. The white vermilion and lip volume should then be addressed. Treatment of these areas prior to the cutaneous

lip in an older patient will lead to a ducklike appearance and therefore should be performed after the cutaneous lip and structural support is completed. Often it is not necessary to define the central vermilion, as it may produce a flattening effect of the upper lip and the featureless upper lip.

The fifth aspect of lip volume that requires treatment is lower lip volume. The lower lip has 2 zones. Centrally it has 2 eggs or balls on either side of the midline with a gap centrally. The central lower lips are injected either from the cutaneous lip or vermilion border toward the wet/dry line. I usually inject across the midline at the vermilion edge if the patient requires further projection of the lower lip. If adequate projection still is not achieved, I inject behind the lower lip where the mucosa abuts the teeth. The lateral lower lip, the second of the 2 zones, often shrivels as a result of aging and can be reinflated by injection of filler. It is easiest to inject directly into the vermilion, directing the injection from medially to the lateral lower lip, filling it up and hydrating the area. One also can inject this area from the cutaneous lip.

Allowing the patient to see the results after half of the upper and lower lips have been treated builds their confidence and helps them understand the look that is being achieved (Figure 10).

### WHAT MEASURABLE CHANGE IS POSSIBLE WITH LIP REJUVENATION?

If we look at the lips and the perioral region, possibly extending to include the jawline, the validated HOYS<sup>14</sup> patient-reported outcome measure can be used to define improvement based on regional skin age score. In a small unpublished study (G.G., 2010), the HOYS software program was used by patients to self-assess their appearance against a set of validated scales throughout 7 geographic regions including the following subregions of the



**Figure 10.** A patient shown halfway through (A) and on completion of lip volume enhancement (B).

perioral/lower face: the nasolabial folds, upper lip wrinkles (at rest and on contraction), upper lip atrophy, lip volume, marionette lines and prejowl sulcus, and jawline. Patients completed a self-assessment of these areas before and after treatment by an injector blinded to the HOYS examination, its results, and suggestions. The HOYS program is a treatment-planning software; part of the study was to assess what treatments the program would suggest as compared to what a blinded experienced injector would do given the freedom to inject what he/she wanted. In this study, no surface work was performed, so it is possible that results could have been even better than what was observed. The injector was given the ability to optimally correct the patient with botulinum toxin and hyaluronic acid. After correction was achieved, skin age improvement was subjectively demonstrated through reassessment. The study included 4 female participants with an average age of 52 years (39, 43, 57, and 69 years). Two HOYS analyses were performed at baseline and 6 weeks posttreatment. On comparison of the results, the average decrease in full-face skin age was found to be 7.5 years, but the lower face scored substantially better with an average decrease of 12.75 years. An example of a 15-year decrease in self-assessed skin age in the perioral region is shown in Figure 5. Using the HOYS system, in the unpublished study all of the blinded injectors' decisions regarding therapy were predicted by the program.

## CONCLUSION

When treating the lips and perioral region, it is imperative to maintain an overall plan. Understanding the structure of the lips and perioral region as well as the resultant effects of the aging process is key, but maintaining the natural proportions of the face ultimately is more important. Aesthetics should be evaluated before considering lip rejuvenation for fashion or cultural reasons, always taking into account the age of the patient to determine what is appropriate for that patient. Assessment using scales may be helpful for both clinical and research purposes. Additionally, movement, surface issues, and volume should be considered when developing a treatment approach. Hopefully the addition of these recommendations to the literature will lead to the evolution of a more natural and acceptable appearance to the treatment of lips.

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