

# Treating the Aging Face: A Multidisciplinary Approach With Calcium Hydroxylapatite and Other Fillers, Part 2

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This is the second of a 2-part series. Building on his earlier discussion of seeing the face both as an entirety and also as a structure with 3 separate regions in Part 1, here Dr. Werschler discusses aesthetic treatment protocols for patients in differing age groups, ranging from the patient in early adulthood to the patient who is fully mature.

Regional aesthetic volume enhancement is a comprehensive approach that may be useful in development of treatment protocols for the youthful enhancement patient, the transitional rejuvenation patient, and the fully adult patient seeking restoration of the face to a more triangular shape. The 3 different age groups of patients tend to seek fairly distinct cosmetic outcomes. Calcium hydroxylapatite and other soft tissue fillers can be used to address the distinct needs of each of the 3 patient groups.

Considerations such as durability or longevity of effect are certainly significant in the choice of any particular product for cosmetic dermatology.<sup>1,2</sup> Equally important, if not more so, is the utility of a product to achieve and maintain an effect. With wrinkle filling, the relative “softness” of the implanted product is a vital characteristic. The ideal product, once implanted, should not be seen or felt differently within the tissue. With contour and volume correction, the robust characteristics of the implanted product may be a more overarching consideration than are softness, compressibility, or flexibility. In fact, the concept of volume—and especially contour

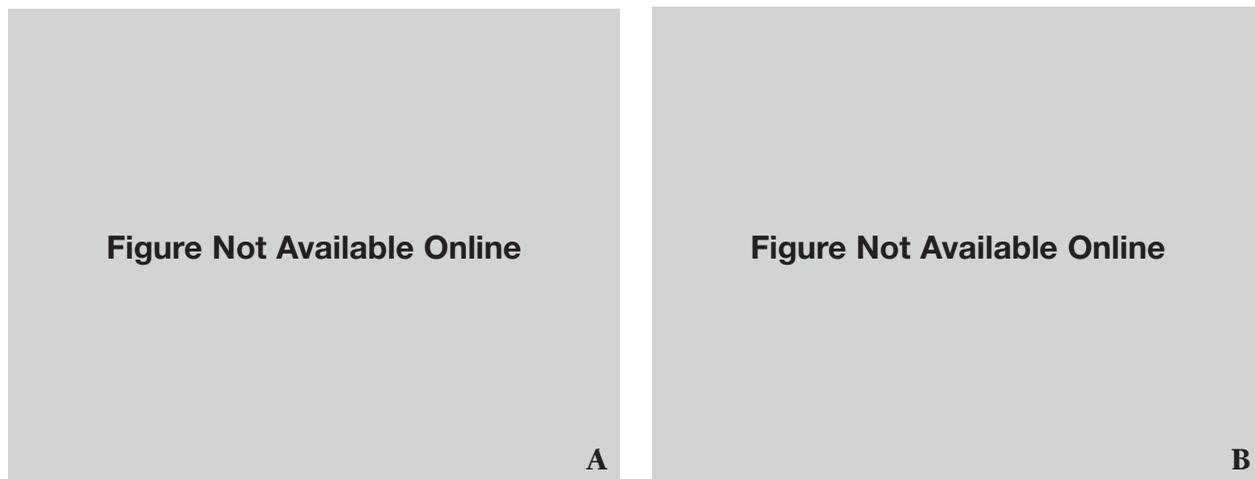
correction—may dictate that the product be implanted deeply, such as in a supraperiosteal location, where characteristics such as cohesiveness, radial expansion, and lack of compressibility may be of primary concern.

## CALCIUM HYDROXYLAPATITE

Fillers available today provide correction by one of 2 very different mechanisms: they stimulate endogenous tissue growth, typically collagen (neocollagenesis), or they replace lost volume with a temporary space-occupying material. These differing mechanistic actions are termed “stimulatory” and “replacement.” As a corollary to these functions, they tend to provide either immediate correction or delayed correction with no immediate visible benefit to the patient. This classification scheme of fillers allows for combination of both types of actions in a single product. As an example of a combination of replacement and stimulatory actions, we have calcium hydroxylapatite (CaHA) microspheres suspended in a carboxymethylcellulose gel carrier. By its very composition, CaHA is designed to provide immediate correction and long-term biostimulatory neocollagenesis.

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**Figure 1.** Calcium hydroxylapatite microspheres in collagen matrix (A) and dissolving into calcium and phosphate ions over time (B). Illustrations courtesy of BioForm Medical, Inc.

This short-term and long-term corrective approach is accomplished initially through the volume of the CaHA injected. Long-term correction ( $\geq 1$  year in most patients) is provided by the dermal collagen-stimulatory action of the CaHA microspheres' tissue scaffold. The carboxymethylcellulose gel carrier volumizes the "lost" space and acts as a replacement filler; the microspheres stimulate neocollagenesis so that, as the gel dissipates, the spheres anchor into the soft tissue. There, they serve as a scaffold for new collagen growth as early as 4 weeks postinjection and then continue for up to at least 12 months.<sup>3,4</sup> CaHA is not permanent, however. The CaHA microspheres are metabolized into calcium and phosphate ions through normal metabolic processes over 24 months (Figure 1). CaHA will not promote osteogenesis in soft tissues, does not migrate, and does not obscure diagnostic x-rays.<sup>3,4</sup>

Currently, one can state with confidence that CaHA is the only product approved by the US Food and Drug Administration that provides both immediate augmentation and extended semipermanent biostimulatory correction to restore facial volume and the contours of youth. In addition, based on comparative clinical trials, less implant volume appears to be required for the same level of correction, when compared to other materials (eg, collagen, hyaluronic acid), making CaHA a value-driven, cost-effective option for physicians.<sup>5</sup> Patient satisfaction with CaHA has been well documented in the literature because of its immediate effect, natural feel in the tissue, and long-term correction.<sup>6</sup>

### REGIONAL AESTHETIC VOLUME ENHANCEMENT

Regional aesthetic volume enhancement (RAVE) is the comprehensive, conceptual approach to the treatment

of facial areas or regions as discrete cosmetic units (eg, midface augmentation), using filling agents to restore facial volume and contours rather than simply to fill in wrinkles and lines. RAVE targets the structural changes of biometric volume loss and the aging dermal effects of photodamage. Together, these result in the loss of youthful balance that ultimately leads to the geometric inversion of the facial triangle. In short, RAVE seeks to restore desired contours and convexity to minimize the atrophy and redistribution of subsurface tissues that combine to result in an aged appearance.

RAVE depends on the careful examination, assessment, and analysis of the patients' underlying contributory factors that result in the clinical presentation. Based on these differential components of such variables as dermal (photodamage) atrophy, lipoatrophy, muscle atrophy, and hard tissue (bone, cartilage, dentition) loss, a diagnosis is established. The diagnosis leads to a choice of options for treatment, which serves as a prescription for enhancement, rejuvenation, and restoration.

### RAVE IN RELATION TO PATIENT AGE

Along this spectrum from simplicity to complexity, as physicians we are fundamentally addressing the needs of 3 fairly disparate groups of cosmetic dermatology patient consumers: the youthful enhancement patient, the transitional rejuvenation patient, and the fully adult restoration patient. Each of these types of patients has experienced some of the consequences of facial growth, development, and aging.

#### Youthful Enhancement Patient

The youthful enhancement patient, most commonly between 18 and 35 years of age, is seeking enhancement of certain features, with a goal of maximizing natural

youth and beauty by improving on existing qualities. Perhaps the lips are felt to be too small, or perhaps the mental crease has always been a little too distinctive, or the nasal tip a bit asymmetric, the eyebrows flatter than desired, or the cheeks a little depressed. Enhancement or correction of these features constitutes aesthetic improvement in the eyes of the youthful patient.

In addition, treatment in this particular patient group may include the addition of certain features that the patient never had, such as enhanced cheek projection. Soft tissue fillers may be used to enhance this region, creating contours that were not present before. This nonsurgical option may provide a more natural-looking contour enhancement than do contours from permanent 3-dimensional silicone implants. Additionally, these non-permanent options allow for subsequent modification of correction to meet age, fashion, and appearance-related changes over time.

#### Transitional Rejuvenation Patient

In contrast, the transitional rejuvenation patient, approximately 35 to 55 years of age, seeks rejuvenation of features to recapture as much of his or her youthful appearance as possible. In this patient, the infraorbital rim has become more pronounced, the nasolabial folds have likely deepened, and marionette lines and drooping oral commissures can no longer be ignored. Rejuvenation of the mid- to lower face, most commonly through soft

tissue fillers, will help this patient recapture a younger appearance and may help him or her present an appearance more consistent psychologically with the perceived age and youthfulness.

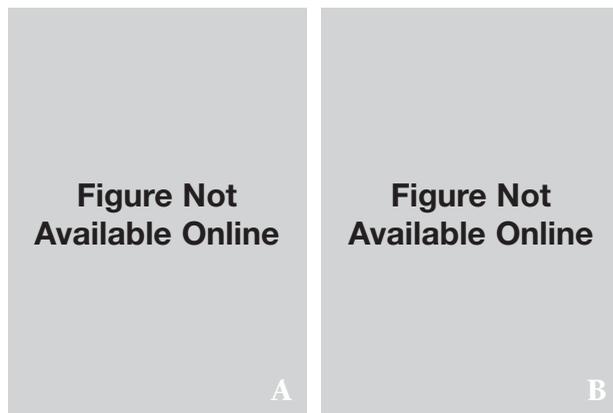
#### Fully Adult Restoration Patient

In the third category, the patient is well into adulthood (ie, 55 years of age or older), with marked changes in the upper, mid-, and lower face that call for restoration. The face has morphed from its original triangular shape to a trapezoidal shape or perhaps even from a trapezoidal shape into an inverted triangle (Figure 2).

In the fully adult patient, correction of the downward descent of the facial soft tissues is likely necessary to simply return the patient to the appearance of health. This patient may present with concerns of returning the skin to health because of an encounter with a disease-related event such as skin cancer or a precancerous lesion. This patient group may need multiple regions of the face addressed, not only the lower third of the face as mentioned but also the midface, where much volume loss occurs as we age. Injection of fillers into the malar and infraorbital areas, as well as the prejowl sulcus, can bring the patient closer to restoration of the triangle of beauty associated with the younger face. It is in this patient group in particular where combinations of surgical and nonsurgical approaches and interventions are used.



**Figure 2.** Over time, the shape of the face morphs from an inverted triangular shape (A) to a trapezoid or upright triangle (B). Illustrations courtesy of BioForm Medical, Inc.



**Figure 3.** Youthful enhancement patient before (A) and 4 weeks after (B) treatment with calcium hydroxylapatite (CaHA) for bilateral cheek augmentation. Patient received 3.9 mL of CaHA on the right side and 2.6 mL of CaHA on the left. To create a higher cheek area, CaHA was placed in the split of the malar fat pad, along the malar eminence, and below the orbital rim. Photographs courtesy of Lisa Bunin, MD.

## MULTIDISCIPLINARY RAVE RESULTS

Dermatology is not the only aesthetic specialty for which RAVE is appropriate. I present here 3 patients from oculoplastic surgery, oral and maxillofacial surgery, and facial plastic surgery. These patients illustrate fairly discrete therapeutic approaches (ie, youthful enhancement, transitional rejuvenation, or fully adult restoration). Whereas the treatment plan for each of these patients entails some aspect of the RAVE approach, RAVE is particularly suited for the rejuvenation and restoration patients. These patients especially profit from seeing the midface and lower face as regional areas for volumizing.

### Youthful Enhancement

Patient 1 presented to Lisa Bunin, MD (an oculoplastic surgeon), discontented with facial sagging. In this patient, CaHA into the malar and submalar areas was sufficient to improve the appearance of her midface.

Figure 3 shows patient 1 prior to treatment and then at her follow-up visit. She did not require any additional soft tissue filler. In time, however, she may elect treatment for several other aspects of the maturing face (eg, marionette lines, prejowl sulcus).

### Transitional Rejuvenation

Patient 2 had complained of looking fatigued. As part of the aging process, gravity has taken its unfortunate toll on her appearance. Loss of midfacial volume and fat and bone resorption have led to deepening of her nasolabial folds, lengthening of the lower eyelids, hollows in the infraorbital region, and loss of malar prominence.

For this patient, Kevin McBride, MD (an oral and maxillofacial surgeon), elected to use a rejuvenative approach,

with facial contouring as his primary objective. Many of you have already observed that injection of soft tissue filler into one area has a positive effect on another area as well. In this case, the CaHA in the submalar eminence restored volume to the face, accentuated her underlying bone structure, and serendipitously also ameliorated her nasolabial folds. Busso and Karlsberg<sup>7</sup> have adeptly characterized the use of CaHA for cheek augmentation.

Figure 4 shows patient 2 prior to treatment and at her follow-up visit. In the future, this individual may choose to address other areas of her face (eg, marionette lines, depressed temporal hollows). She may even be a candidate for a more extensive volumetric approach, using stimulatory fillers and soft tissue replacement fillers.

### Fully Adult Restoration

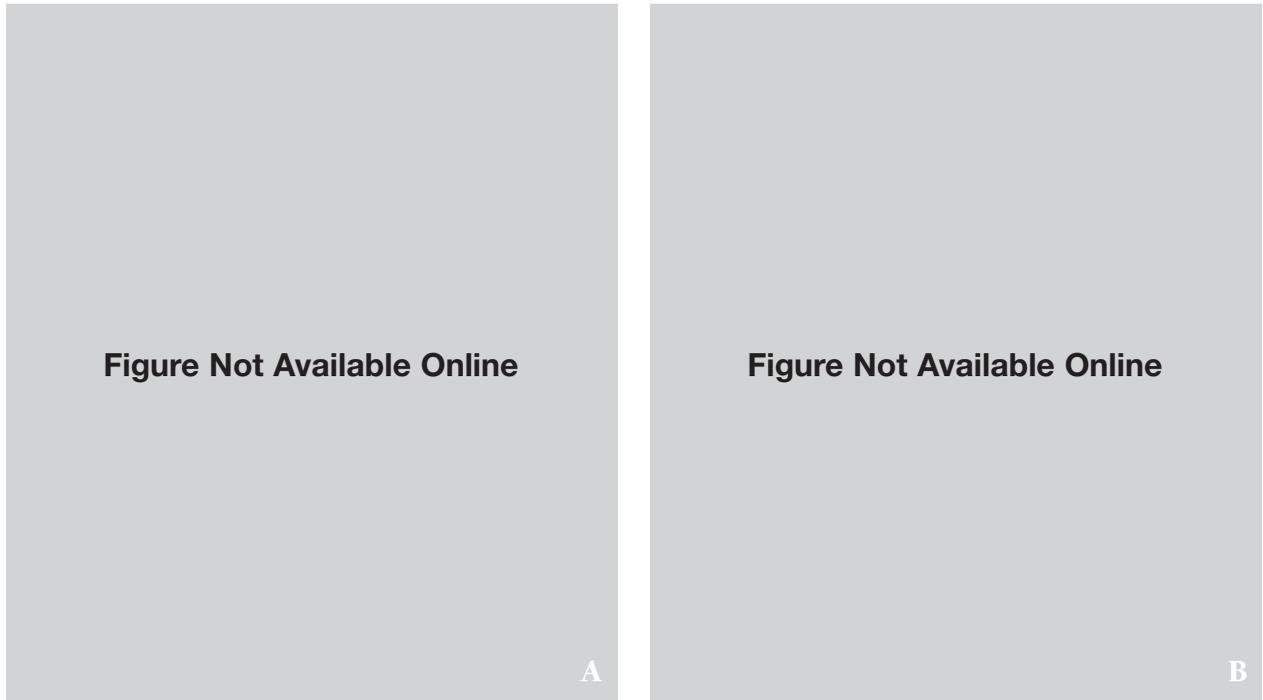
Patient 3 presented to Steven Dayan, MD (a facial plastic surgeon), with some of the concerns of patient 1. In addition, she stated, “I don’t want to look particularly young; I just want to look rested and well cared for.” Dr. Dayan’s understanding of this patient’s request was not so much a renewal as it was a restoration of features in her face that had shifted over time. To that end, the physician addressed her nasolabial folds, marionette lines, and prejowl sulcus. These changes should be sustained through collagenesis for one year or longer. Figure 5 shows patient 3 prior to treatment and at her follow-up visit.

## SUMMARY

Physicians now have well over one dozen filler products from which to choose as they map out treatment strategies to address the needs of their patients. Each of these products has unique features and benefits; for example, CaHA is likely better for one application, botulinum toxin type A for another, and hyaluronic acid for still another. Each has its place in our treatment inventory. Nevertheless, CaHA may be better suited for volumizing and contouring applications by virtue of its properties of immediate and long-term correction, robust cohesiveness, and collagen stimulation.

Hyaluronic acids, which act through the binding of water, are designed for immediate correction, especially of more superficial wrinkles and folds, but lack the biostimulatory features of collagen synthesis as a primary mechanism of action and the robust cohesive nature needed for tissue suspension. Hyaluronic acids appear to be best suited to defined tissue compartments (eg, lips, tear troughs) rather than for large surface area volumization and tissue lifting.

Poly-L-lactic acid works exclusively through the action of dermal collagen stimulation and is best suited for panfacial treatment of dermal atrophy. Because poly-L-lactic

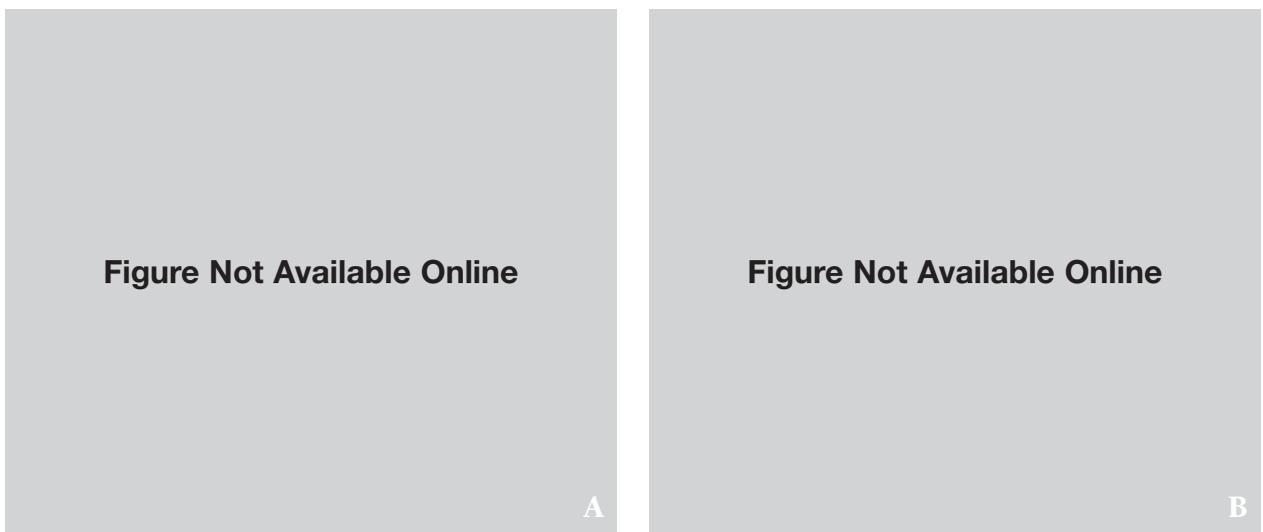


**Figure 4.** Transitional rejuvenation patient before (A) and 14 days after (B) treatment with calcium hydroxylapatite (CaHA) for tear trough correction. Patient received 0.8 mL of CaHA on the right side and 0.6 mL of CaHA on the left. Photographs courtesy of Kevin McBride, MD.

acid lacks any immediate filling effect beyond that of the injected sterile water carrier, multiple treatments over several months are generally required to achieve the final effect, which is durable for several years. This effect is less site specific and more global in nature, in some ways the opposite of the effect of hyaluronic acids.

Looking at the 3 zones of the face—each of which has geometric contributions to symmetry and balance—rather

than at a specific line here or a sulcus there, physicians can begin to shift their practice from remedying a single problem to a more comprehensive level of care that encompasses the return of youthful volume and contours to the faces of their patients. In other words, we treat the entire face by looking at how an area of the face relates to the whole of it. The line, sulcus, rhytide, or commissure will be corrected, of course, but only as a strategy



**Figure 5.** Fully adult restoration patient before (A) and 3 months after (B) treatment with calcium hydroxylapatite for nasolabial folds and prejowl sulcus. Patient received 3.9 mL of calcium hydroxylapatite. Lips were treated with 1.0 mL of hyaluronic acid. Photographs courtesy of Steven Dayan, MD.

## TREATING THE AGING FACE

for adding volume to the face, not as an objective in and of itself.

This is the evolution of facial filling agents—multiple products, each with unique attributes and uses, used in combination to create natural-looking, youthful contours, symmetry, and balance. RAVE is a more aesthetically holistic approach to optimizing facial shaping with minimally invasive approaches—an approach based on an appreciation given to us by nature and immortalized by the great masters of art throughout history. This concept of RAVE is independent of any single product or injection style but, instead, depends on careful assessment of the patient presentation, a visualization of the desired outcome, and a specifically chosen armamentarium of products used. In this context, CaHA is considered a foundation treatment, a “workhorse” product, complementary to other fillers, toxins, and procedures.

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