

# Facial Contouring With Injectable Biphasic Filler Materials

Melvin L. Elson, MD

The inverted triangle of the youthful face is changed over time by environmental and endogenous processes, and facial skin sags downward to fill the trapezoid shape of the aged face. Although common, rhytidectomy does not fully impart a more youthful appearance because a youthful face is not one that is pulled tight, but one that is round and full. Injectable biphasic facial soft tissue fillers can be used in order to create a fuller, more contoured, younger facial appearance. This article discusses the benefits of using biphasic facial soft tissue fillers for augmentation and the cosmetic techniques to employ when using the fillers for facial contouring.

Although facial soft tissue augmentation has been performed in one fashion or another for centuries, the modern era of facial contouring using filler materials actually began with the approval of the injectable bovine dermal collagen implant (Zyderm) by the US Food and Drug Administration in 1981.<sup>1</sup> Ever since the inception of products that allowed clinicians to fill fine lines and wrinkles and treat some acne scars, it has been the goal not only to be able to contour the face with soft tissue filling materials, but to induce natural collagen synthesis and produce long-lasting correction of the defect. With the advent of injectable biphasic filler materials these goals are achievable. Newer injectable biphasic soft tissue fillers not only restore volume in the face, but also help to correct the changes in collagen synthesis and activity that underlie age-related volume loss.<sup>2</sup>

Care must be taken, however, not only to choose the proper facial soft tissue filler but to learn the proper cosmetic injection technique to achieve the desired result. There are many facial soft tissue fillers available on the market worldwide and there are now quite a

few injectable biphasic filler materials. Biphasic fillers are defined as injectable fillers that utilize 2 different materials in the syringe; the first phase produces immediate correction as well as serves as a carrier for the second phase, which induces endogenous collagen production to replace the filler material with natural collagen.<sup>3</sup> When choosing the appropriate soft tissue filler for facial contouring it is imperative that the filling material be both biocompatible and biodegradable. There is no place in facial soft tissue augmentation for materials that do not have both of these characteristics. Filling materials that are biocompatible but not biodegradable should not be used for soft tissue augmentation. It is not only because these materials may produce granulomas and significant inflammation in the immediate postinjection period, but there may be significant reactions that occur months or years after injection.

Although there are a number of injectable biphasic fillers available outside the United States, there is only one that meets these criteria that is available in the United States that is composed of synthetic calcium hydroxylapatite (CaHA) microspheres (25–45  $\mu\text{m}$ ) suspended in an aqueous polysaccharide gel (sodium carboxymethylcellulose 1.3%, glycerin 6.4%, water 36.6%) for injection (Radiesse). Another injectable biphasic filler is a cross-linked hyaluronic acid (HA) gel that contains 25 mg/mL stabilized HA and 25 mg/mL dextranomer beads (Redexis). It is used commonly in other places such as Canada, Europe, and Asia and should be

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*Dr. Elson is Medical Director, Longevity Institute, LLC, Nashville, Tennessee.*

*The author reports no conflict of interest in relation to this article.*

*Correspondence: Melvin L. Elson, MD, 4081 Hwy 96, Burns, TN 37029 (drmelson@bellsouth.net).*



**Figure 1.** Method of injecting biphasic facial soft tissue fillers for contouring the aging face.

available soon in the United States. Regardless of which biphasic injectable soft tissue filler is used, the technique that is used to inject the filler is critical.

Biphasic injectable soft tissue fillers must be injected into the area that is the junction of the dermis and the subcutaneous tissue or lower. Care must be taken not to allow the material to be injected into the dermis. The method that allows clinicians to know when one is in the correct plane is to enter the dermis, which will give resistance and then go slightly deeper until the resistance gives, which indicates the needle has reached the proper plane. Clinicians can inject facial soft tissue fillers in this plane utilizing a number of different angles while remaining in the same plane forming a scaffold to keep the augmentation in place. Clinicians must take care to stop injecting filler material while still in the subcutaneous space to avoid injecting material into the dermis as the needle is withdrawn (Figure 1).

The 2 injectable biphasic filler materials previously mentioned are administered in the manner described, but they are not the same material and each filler has some nuances of its own.

One of these fillers is a biphasic biostimulatory filler consisting of synthetic CaHA microspheres suspended in an aqueous gel matrix of sterile water for injection containing glycerin and sodium carboxymethylcellulose (Radiesse).<sup>4</sup> In the first phase the filler is injected and the aqueous gel matrix produces immediate correction while delivering the CaHA microspheres to the area to increase volume. In the second phase, over a period of 6 to 8 weeks the aqueous gel matrix biodegrades as the CaHA microspheres attract host fibroblasts and induce production of collagen. The CaHA microspheres then biodegrade into calcium and phosphate leaving the host collagen that has formed as the volumizing material. The treatment results of facial soft tissue augmentation with this CaHA filler should last 12 to 18 months, but there are reports in the literature of correction lasting much longer.<sup>3</sup>

The biphasic biostimulatory filler consisting of synthetic CaHA microspheres (Radiesse) is approved in the United States for a number of indications, including nasolabial fold augmentation and similar defects. It also has been used for many years as a tissue marker, for vocal fold augmentation, and as a treatment for maxillofacial defects.<sup>5</sup>

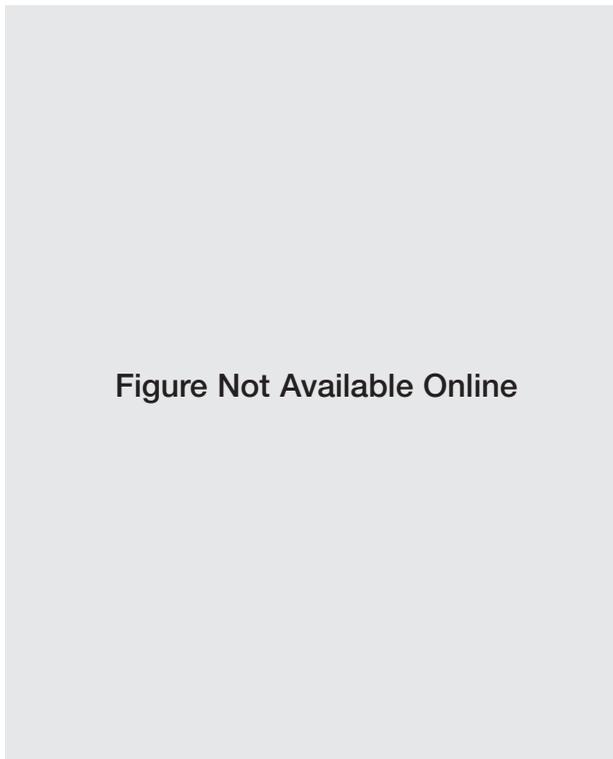
Another injectable biphasic filler, a cross-linked HA gel filler containing stabilized HA 25 mg/mL and dextranomer beads 25 mg/mL (Redexis), is not yet approved in the United States but is available for use in Canada, Europe, and most of Asia.<sup>6</sup> Similar to the CaHA filler (Radiesse), the HA gel filler (Redexis) consists of 2 phases. The first phase of the HA gel filler (Redexis) injection produces immediate correction of facial defects and is used as a vehicle to deliver the second or biostimulatory phase, which is composed of dextranomer beads that are made of biodegradable polysaccharide and attract host fibroblasts to induce collagen formation in the desired area. Similar to CaHA, this biphasic HA filler induces host collagen production, which results in the long-lasting correction for the desired facial volumization.<sup>6</sup>

Because these injectable biphasic filler materials are quite robust they are not useful for all forms of soft tissue augmentation. They should not be used for augmentation of the lips, injection in the glabellar area, or treatment of fine lines and wrinkles. Although biphasic fillers certainly are very useful in the treatment of nasolabial folds and oral commissures, they are particularly suited for restoring volume to the face because volume loss and contour changes are the true hallmarks of the aging face (Figure 2).<sup>7</sup>

The youthful face is described as an inverted triangle that changes with age due to the effects of gravity and gradually becomes a trapezoid.<sup>8</sup> There is thinning of



**Figure 2.** A female patient before facial contouring with biphasic soft tissue filler.



**Figure 3.** A female patient after facial contouring with biphasic soft tissue filler.

the temporal fat pad and movement of the support tissue above the zygomatic process downward, which creates the fold above a concave area and pushes medially to create the nasolabial fold. The result of this movement also creates the groove under the eyes and allows the darkness to show through the thin facial skin. Jowls also form as movement continues and facial skin sags downward to fill the trapezoid shape of the aged face.

Although for decades the accepted procedure for the treatment of the aging and sagging face has been rhytidectomy, this does not accomplish a youthful appearance because a youthful face is not one that is pulled tight, but one that is round and full. Creating a fuller, more contoured facial appearance without overtightening the skin is what contouring with soft tissue filler materials can accomplish.

It also must be kept in mind that as the face ages, there is resorption of bone and shrinkage of the skull (personal communication, Duke University Department of Radiology, 2009). As the mandible undergoes bony resorption, the prejowl sulcus forms and this defect has been corrected with solid surgical implants. With the advent of the biostimulatory injectable biphasic fillers it is now possible to produce substantial correction of this problem without invasive surgery. The goal is to recreate the inferior border of the mandible and the filler material is placed deep in the subcutaneous tissue and massaged into place to correct the defect. More filler material may be placed above the corrected area to further provide the roundness of this area that is characteristic of a youthful appearance.

One of the main areas in which the aging of the face is substantially notable is the tear trough. This also is an area that can be corrected with injectable biphasic filler materials once the technique is mastered. Superficial placement of any filler in this area must be assiduously avoided because there will be lumps and unevenness and with HA material there is the possibility of the Tyndall effect with the area giving off a bluish tint. The best materials to use to correct this defect are the injectable biphasic biostimulatory filler materials.

Injectable facial soft tissue fillers should be placed in small aliquots just above the periosteum under the orbicularis oculi muscle and followed by massage to even the augmentation. To be certain the filler is injected into the correct plane, insert the needle onto the periosteum and then draw back slightly to avoid injecting the filler into the periosteum. Injection should not be performed above the orbital rim and care should be taken to use the noninjecting hand to guide the needle and material away from the eye orbit.

Although there are many indications for contouring with injectable biphasic fillers, not all areas should be injected with this type of material. Lip augmentation for various purposes remains a popular procedure, but these types of materials should not be used in the lips as they are very likely to leave lumpy disfiguring areas. As mentioned previously, they should also never be used to inject any superficial fine lines or wrinkles.

Keeping in mind that the youthful face is round and full and not pulled tight, the injectable biphasic filler materials are the perfect material for facial soft tissue augmentation to produce a fuller, more youthful appearance.

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