

Advances and Refinement in Hyaluronic Acid Facial Fillers

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Summary: Fillers temporarily augment deflated or ptotic facial compartments to restore a youthful appearance. Hyaluronic acids predominate the fillers market because of their focal volumization, duration of effect, low incidence of adverse reactions, and reversibility. Being able to properly perform these in-office procedures will ensure safety for patients and provide aesthetically optimal results. This communication provides the senior author's (R.J.R.) stepwise approach to facial aging and deflation with soft-tissue injectable fillers. (*Plast. Reconstr. Surg.* 138: 233e, 2016.)

The use of soft-tissue fillers has increased by approximately 253 percent from 2000 to 2014 and has become a popular adjunct for facial rejuvenation.¹ Being able to properly perform these in-office procedures will ensure safety for patients and provide aesthetically optimal results. This communication provides the senior author's (R.J.R.) stepwise approach to facial aging and deflation with soft-tissue injectable fillers.

Fillers temporarily augment deflated or ptotic facial compartments to restore a youthful appearance. Hyaluronic acids predominate the fillers market because of their focal volumization, duration of effect, low incidence of adverse reactions, and reversibility.²⁻⁴ These products have varying viscosities and elasticity (G'), making them ideal for different depths of soft tissue and regions of the face (Table 1). The plastic surgeon should choose a product based on accessibility, adaptability, and performance, and then master its utility. Other safe and U.S. Food and Drug Administration–approved fillers are also available on the market, including collagens, calcium hydroxyapatite, poly-L-lactic acid, and polymethylmethacrylate, but our discussion and video are confined to hyaluronic filler use.

INDICATIONS

Facial aging is a culmination of dermal atrophy, muscle atrophy, and lipatrophy resulting in

inverted facial geometry and appearance. The indication for facial fillers is generally to soften signs of facial aging and restore the facial aesthetic “triangle of youth.”⁵ Facial analysis should be performed by the surgeon to decide whether and what fillers are appropriately indicated to achieve the goals of the patient. The surgeon should counsel patients that fillers may supplement surgical solutions, but may not replace surgical indications.

TECHNIQUE

Preparation, dilution, and injection of facial fillers should be performed under sterile technique, because filler-induced infections have been reported in the literature.⁶ Our clinical practice prefers chlorhexidine. This antimicrobial should be applied under skin stretch to ensure adequate cleansing of facial rhytide troughs.

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Table 1. Hyaluronic Acid Fillers

	Density	Injection Level	Anticipated Duration (mo)	FDA-Approved Use	Target Areas
Belotero Balance	Moderate	Superficial dermis	6	Smooth wrinkles, NLF	NLF, perioral rhytides
Hydrelle (Eleveess)	High	Mid to deep dermis	Up to 12	Moderate to severe facial wrinkles	NLF, lip augmentation
Juvéderm Ultra	Moderate	Mid to deep dermis	Up to 12	Moderate to severe wrinkles	Temporal hollowing, NLF
Juvéderm Voluma	High	Deep dermis to suprapariosteal	Up to 24	Cheek augmentation	Cheek augmentation
Perlane	High	Deep dermis to superficial subcutis	6	Moderate to severe wrinkles	Temporal hollowing, NLF
Prevelle Silk	Low	Superficial dermis	3–4	Lip augmentation, perioral rhytides	Lip volumization, perioral rhytides
Restylane	Moderate	Dermal-epidermal junction	6	Moderate to severe facial wrinkles	Perioral rhytides, NLF, temporal hollowing
Restylane Silk	Low	Superficial dermis	6	Lip augmentation, perioral rhytides	Lip volumization, perioral rhytides

FDA, U.S. Food and Drug Administration; NLF, nasolabial folds.

Patient anesthesia keeps the patient comfortable and ensures precise delivery of fillers in the correct tissue plane. Methods for anesthesia include nerve blocks, ice packs, and topical anesthesia; all of these methods have been reported with good results.^{7,8} Our clinical practice prefers ice rollers and gentle pressure in addition to local anesthetic mixed with the injectable product.

Multiple injection techniques have been described with the goal of maximizing volume and limiting contour deformity.⁹ Methods include linear threading, crosshatching, fanning, and serial puncture. Superiority of a single technique has not been established and should be individualized for each patient being treated and the topography of the site injected.³ Injection of product should be carried out using the smallest possible gauge needle that will deliver the product effectively. A 27-gauge needle may be used for more viscous fillers or a 30-gauge needle may be used for thinner products.¹⁰ Lights may also be positioned to allow visualization and avoidance of the vasculature.

Most common areas addressed include temporal hollowing, midface and midcheek depressions, defined nasolabial folds, oral commissure depressions, marionette lines, and perioral rhytides. Temporal hollowing may be treated with any of the volume fillers, but the senior author (R.J.R.) generally recommends a moderate-viscosity hyaluronic acid, such as Restylane (Galderma Laboratories, Fort Worth, Texas), combined with 0.5 cc of 1% lidocaine. This formulation allows better flow of the product as it is injected into the temporal and lateral brow area. The procedure begins by injecting the lateral area near the hairline, proceeding inferiorly to the zygomatic area, and then moving superomedially in the

temporal area. The hollowing immediately superior to the lateral brow can also be addressed in this manner. In total, approximately 1.5 cc is typically injected per side. This augmentation is performed primarily in the subcutaneous plane with anterograde and retrograde injections. Others have reported a bolus injection at the deep temporal fascial plane with equivocal success.⁹ The key is not to overcorrect; gentle massage may be required to evenly distribute the filler in areas of wasting.

A denser hyaluronic acid filler (increased G') is recommend to address the midface; our practice prefers Voluma (Allergan, Inc., Irvine, Calif.) to treat the atrophied fat pads in the lateral cheek, middle fat pad, inferior fat pad, and the deep central fat pad. Approximately 1 to 2 cc is injected per side, and depending on asymmetries in facial fullness, the contralateral fat compartments may be injected with a different amount to achieve facial harmony. The goal is not to round out the face and make it appear excessively full, but to fill submalar hollowing and reestablish the "triangle of youth."

The nasolabial folds, commissures, and lateral chin can be addressed with a less viscous hyaluronic acid filler (lower G'), such as Juvéderm Ultra (Allergan). Radial injections start inferolaterally into the lateral chin area and proceed superiorly with lateral to medial injections. The lower lip may be injected in a cross-radial manner at the commissures to achieve a fuller appearance and lift the inferior portion of the commissure. The upper lip may be injected at the lateral thirds to accentuate the philtral columns. Injections should be at the vermilion border, making sure to blend the area.



Video. Supplemental Digital Content 1, which outlines the stepwise approach to facial analysis and subsequent injection of various hyaluronic acid fillers, is available in the “Related Videos” section of the full-text article on PRSJJournal.com or, for Ovid Users, at <http://links.lww.com/PRS/B778>.

Perioral rhytides may be addressed with the least dense intradermal fillers (lowest G'), such as Restylane Silk or Belotero (Merz, Frankfurt, Germany). These fillers have less propensity to cause a Tyndall effect and may be injected in the dermal lip immediately deep to perioral rhytides and philtral columns. Consistent intraoral and extraoral palpation and gentle massage of any irregularities is of particular importance in this area to evenly distribute product.

For adding lower lip volume, injection is reserved to the medial two-thirds of the lower lip and should be performed at the level of the superficial mucosa with a low-viscosity filler such as Restylane Silk or Belotero. A good reference is to draw vertical lines from the alar bases to mark the lateral borders of injection. Injection of fillers at this site should also be intradermal and can even address horizontal creases to achieve a more full and youthful appearance.

It is common for patients undergoing facial filler injections to also receive facial neuromodulator injections. The primary author's (R.J.R.) preference is to place neuromodulators before fillers, as the area of injection may be more precise when there is no swelling from prior infiltration. However, it can be performed either way, and if there is concern that neuromodulators will diffuse after filler injection (which is only theoretical), they should be placed after filler volumization is complete. We do not massage the filler in areas that had undergone neuromodulator injection. (See **Video, Supplemental Digital Content 1**, which outlines the stepwise approach to facial analysis and subsequent injection of various hyaluronic

acid fillers, available in the “Related Videos” section of the full-text article on PRSJJournal.com or, for Ovid Users, at <http://links.lww.com/PRS/B778>.)

COMPLICATIONS

The potential complications related to facial fillers should be discussed with the patient before injection while obtaining informed consent. Most adverse reactions are short term and resolve on their own within 7 days. Injection may cause pain, bruising, swelling, erythema, pruritus, or tenderness. If injected too superficially, fillers may cause visible lumps or grayish discoloration (Tyndall effect). Hyaluronidase should always be available to immediately reverse an unwanted aesthetic outcome or ischemic event.

CONCLUSIONS

Facial fillers are an important tool for facial rejuvenation to the practicing aesthetic surgeon. A thorough knowledge of their uses, risks, and methods of delivery is imperative to provide patients with a wide spectrum of options that can be individualized to specific patient needs. This summary provides our stepwise approach to facial analysis and subsequent treatment; of note, various products and applications can be used with equivocal outcomes but are operator dependent.

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PATIENT CONSENT

The patient in the video signed a written consent document for the use of this material before the filming of this demonstration.

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