

## Treatment Areas





## Nasolabial Folds



**FIGURE 1** ● Nasolabial folds before (**A**) and 2 weeks after (**B**) dermal filler treatment, using hyaluronic acid.

Nasolabial folds are natural facial contours that can become more prominent with age, projecting a fatigued or drawn appearance. Reduction of the nasolabial folds is one of the most commonly performed dermal filler treatments.

### Indications

- Nasolabial folds

### Anatomy

**Wrinkles, folds, and contours.** Nasolabial folds, or melolabial folds, course diagonally in the midface from the nasal ala toward the corner of the lip (see Dermal Filler Anatomy section, Figs. 1 and 2). Many factors contribute to nasolabial fold formation including soft tissue volume loss and dermal atrophy, reduced skin elasticity, descent of malar fat pads, and hyperdynamic midface musculature. The lateral nasal artery is the main vascular supply for the nasal tip and ala. It is in close proximity to the nasolabial fold, 2–3 mm superior to the alar groove (see Dermal Filler Anatomy section, Figs. 3 and 5).

## Patient Assessment

- Patients with mild, moderate, and severe static nasolabial folds are candidates for dermal filler treatments.
- Patients presenting with excess laxity and hanging skin folds usually require surgical intervention for significant improvement.

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.

## Treatment Goals

- Reduction of nasolabial folds without full effacement.

## Recommended Dermal Filler Product

- Basic hyaluronic acid (HA) dermal filler products that have lidocaine (HA-lidocaine) are recommended for treatment of nasolabial folds, such as Juvederm® Ultra XC, Juvederm® Ultra Plus XC or Restylane-L® (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section).
- This chapter describes treatment of nasolabial folds with Juvederm Ultra Plus XC (HA-lidocaine).

## Dermal Filler Treatment Volumes

- The estimated HA dermal filler volume necessary for treatment is based on the patient's observed facial anatomy and volume loss in the treatment area. Typical starting volumes are listed as follows:
  - Mild nasolabial folds typically require a total volume of 0.8-mL HA-lidocaine.
  - Moderate nasolabial folds typically require a total volume of 1.6-mL HA-lidocaine.
  - Severe nasolabial folds typically require a total volume of 2.4-mL HA-lidocaine.

## Equipment for Anesthesia

- Local infiltration injection supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered (referred to as buffered 2% lidocaine-epinephrine solution)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Equipment for Dermal Filler Procedure

- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Anesthesia Overview

- **Local lidocaine infiltration.** Buffered 2% lidocaine-epinephrine solution can be used to achieve anesthesia for nasolabial folds.
- Both folds are anesthetized using six injections of 0.1 mL for a total volume of 0.6 mL (Fig. 2).



● = 0.1 mL Lidocaine

**FIGURE 2** ● Anesthesia for nasolabial fold dermal filler treatment.

See Injectable Anesthetics in the Anesthesia section for additional information on local infiltration methods. Sensitivity increases with proximity to the nose and anesthetic injections are started at the inferior portion of the fold.

- **Topical anesthetic.** Benzocaine:lidocaine:tetracaine (BLT) may be used as an alternative for patients with high pain thresholds (see Topical Anesthetics in the Anesthesia section).

## Dermal Filler Procedure Overview

- **Overview.** An overview of injection points and injection technique for treatment of nasolabial folds, using a HA dermal filler is shown in Figure 3.
- **Number of injections.** There are two linear thread injections and one fanning injection per side (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section). All injections are placed medial to the nasolabial folds. Injections start at the inferior most portion of the nasolabial fold and proceed superiorly toward the nose.
- **Injection depth.** Dermal filler is injected in the mid- to deep dermis for treatment of nasolabial folds.



→ = Dermal filler injection

**FIGURE 3** ● Overview of nasolabial fold dermal filler injections.

- **Cautions**

- The lateral nasal artery is the main vascular supply for the nasal tip and ala and it is avoided with treatment of the nasolabial folds.
- The nasolabial fold is a natural facial contour and full effacement can result in an undesirable simian appearance.

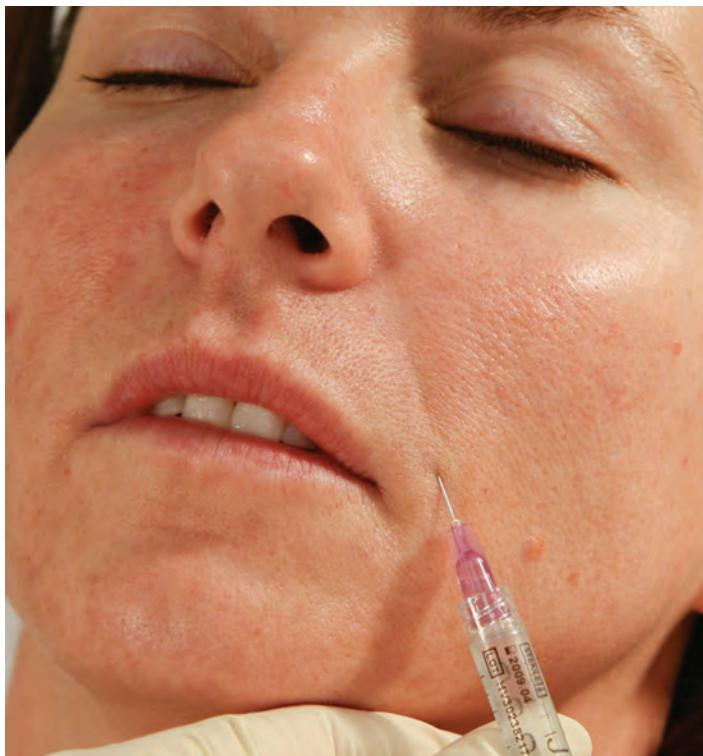
## Performing the Procedure: Dermal Filler Treatment of Nasolabial Folds

### Anesthesia

1. Clean and prepare the skin lateral to the nasolabial folds with alcohol.
2. Inject buffered 2% lidocaine-epinephrine solution subcutaneously as shown in Figure 2.
3. Allow a few minutes for anesthesia.

### Dermal Filler

1. Position the patient in a 60-degree reclined position.
2. Prepare the nasolabial folds with alcohol.
3. The provider is positioned on the same side as the nasolabial fold to be injected.



**FIGURE 4** ● First injection for nasolabial fold dermal filler treatment.

4. Attach a 30-gauge,  $\frac{1}{2}$ -inch needle to the prefilled HA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. The first injection point is medial to the nasolabial fold at the inferior portion of the fold (Fig. 4). Insert the needle at a 30-degree angle to the skin, directing it toward the ala, and advance to the needle hub. Apply firm and constant pressure on the syringe plunger, while gradually withdrawing the needle to inject a linear thread of filler in the mid- to deep dermis.
7. The second injection point is approximately 1 cm superior to the first injection point and placed as above (Fig. 5).
8. The third injection point is 1 cm superior to the second injection point and the fanning technique is used. Insert the needle at a 30-degree angle to the skin and advance until the tip lies at the edge of the ala. Inject filler in a linear thread as described above. Without fully withdrawing the needle from the skin, redirect the needle inferiorly and medially using small angulations to ensure dermal filler placement is contiguous (Figs. 6A and 6B). Repeat until desired correction is achieved.
9. Compress the treatment area with thumb on the skin and first finger intraorally to smooth any visible or palpable bumps of filler product. If bumps do not easily compress, the area may be moistened with water and stretched between the provider's fingers. Additional swelling and bruising commonly occur after compression and manipulation of filler product.
10. Repeat the above injections for the contralateral side of the face.



**FIGURE 5** ● Second injection for nasolabial fold dermal filler treatment.

## Tips

- Avoid placing filler product in the superficial dermis as this may result in an undesirable visible ridge of filler, which does not readily compress.
- Avoid treating lateral to the nasolabial folds as this can exacerbate the folds.
- Watch for tissue blanching of the nasal ala and other ischemic signs or symptoms. If ischemia occurs, manage as described in the Complications section.

## Results

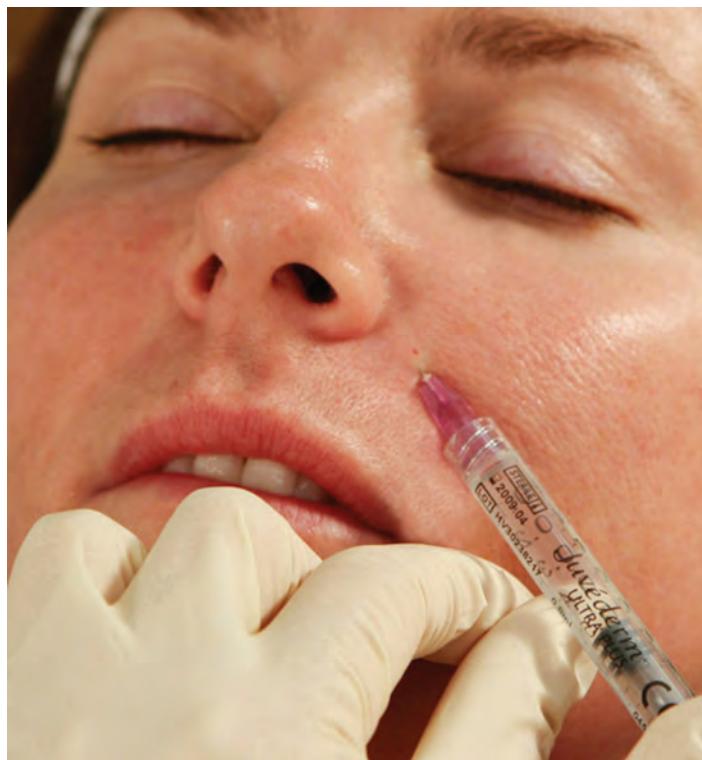
- Reduction of nasolabial folds is immediately evident at the time of treatment. Figure 1 shows a 38-year-old woman with moderate nasolabial folds before (A) and 1 week after (B) treatment with 1.6-mL HA dermal filler, Juvederm Ultra Plus.

## Duration of Effects and Subsequent Treatments

- Visible correction of nasolabial folds typically lasts 9 months to 1 year after treatment.
- Subsequent treatment with dermal filler is recommended when the volume of dermal filler product is visibly diminished and nasolabial folds become more evident, prior to their pretreatment appearance.

## Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for reduction of nasolabial folds. Common issues reported by patients during this time include the following:



A



B

**FIGURE 6** ● Third injection point for nasolabial fold dermal filler treatment (A) with medial fanning technique (B).

- **Bruising, swelling, erythema, and tenderness.** See Follow-ups and Management in the Introduction and Foundation Concepts section.
- **Persistent nasolabial folds.** Patients should be assessed for the following:
  - **Static nasolabial folds.** Additional dermal filler may be necessary if a volume deficit persists. Typically 0.4–0.8 mL HA-lidocaine will achieve the desired result.
  - **Dynamic nasolabial folds.** Combination treatment with botulinum toxin may be required to achieve optimal results in patients with deep dynamic nasolabial folds, see Combining Aesthetic Treatments later.

## Complications and Management

- General dermal filler complications and management are reviewed in the Complications section
- Tissue ischemia and tissue necrosis

**Tissue ischemia** resulting from intravascular injection and occlusion of the angular artery may occur with nasolabial fold treatments. Signs of vascular compromise and ischemia include a violaceous reticular pattern or white blanching, and may be painful or painless. These changes may be seen on the nose and/or nasolabial fold, and can present immediately, or be delayed. One case report identified ischemic changes 6 hours after dermal filler treatment. Ischemia is managed urgently as it can rapidly progress to **tissue necrosis** (see Complications section for management).

## Combining Aesthetic Treatments and Maximizing Results

- **Botulinum toxin.** Some patients excessively contract the lip levator muscles during smiling resulting in deep nasolabial folds and a “gummy smile.” In these patients, combining dermal filler treatment of the nasolabial fold with botulinum toxin treatment of the levator labii superioris alaeque nasi muscle can improve reduction of nasolabial folds.
- **Dermal filler in adjacent areas.** Patients requiring nasolabial fold treatment may also require treatment of the malar area. Restoring midface volume often reduces nasolabial folds, and it is advisable to perform malar augmentation first and reassess nasolabial folds afterwards (see Malar Augmentation chapter).
- **Dermal filler layering.** Although moderate to severe nasolabial folds can be treated with an HA dermal filler, using the techniques described in this chapter, improved outcomes can often be achieved by layering two types of dermal fillers. Layering is considered an advanced procedure, which consists of placing a dermal filler with more structural support in areas of deep dermal volume loss, and overlaying it with a thinner, more malleable dermal filler to smooth superficial fine lines and wrinkles (see Layering Dermal Fillers chapter).

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, the injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$500 to \$800 per syringe of 0.8-mL HA for treatment of nasolabial folds.

## Marionette Lines



A



B

**FIGURE 1** ● Marionette lines before (A) and 4 weeks after (B) dermal filler treatment, using hyaluronic acid.

Prominent marionette lines project sadness, and reduction of these lines is one of the most commonly performed dermal filler procedures. Using appropriate filler volume and injection techniques, support to the lateral lower lip can be restored with correction of marionette lines and downturned oral commissures. In this chapter, reference to marionette lines also includes downturned oral commissures as these often occur together.

### Indications

- Marionette lines
- Downturned oral commissures

### Anatomy

- **Wrinkles, folds, and contours.** The corners of the mouth, where the upper lip meets the lower lip, are called the oral commissures. Marionette lines are folds which descend from the oral commissures toward the jaw (see Dermal Filler Anatomy section, Figs. 1 and 2). Many factors contribute to marionette line formation including soft tissue volume loss and dermal atrophy, biometric volume loss with resorption of mandibular bone, reduced skin elasticity, buccal descent, and hyperdynamic lower face musculature.

## Patient Assessment

- Patients with mild, moderate, and severe static marionette lines are candidates for dermal filler treatments.
- Patients presenting with excess laxity and hanging skin folds usually require surgical intervention for significant improvement.

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.

## Treatment Goals

- Reduction of marionette lines with full effacement.
- Repositioning downturned oral commissures to their natural horizontal position.

## Recommended Dermal Filler Product

- Basic hyaluronic acid (HA) dermal filler products that have lidocaine (HA-lidocaine) are recommended for treatment of marionette lines, such as Juvederm® Ultra XC, Juvederm® Ultra Plus XC or Restylane-L® (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section).
- This chapter describes treatment of marionette lines with Juvederm Ultra Plus XC (HA-lidocaine).

## Dermal Filler Treatment Volumes

- The estimated HA dermal filler volume necessary for treatment is based on the patient's observed facial anatomy and volume loss in the treatment area. The following are recommended starting volumes, using HA-lidocaine products:
  - Mild marionette lines typically require 0.8 mL HA-lidocaine.
  - Moderate marionette lines typically require 1.6 mL HA-lidocaine.
  - Severe marionette lines typically require 2.4 mL HA-lidocaine.

## Equipment for Anesthesia

- Local infiltration injection supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered (referred to as buffered 2% lidocaine-epinephrine solution)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Equipment for Dermal Filler Procedure

- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Anesthesia Overview

- **Local lidocaine infiltration.** Buffered 2% lidocaine-epinephrine solution can be used to achieve anesthesia for marionette lines.

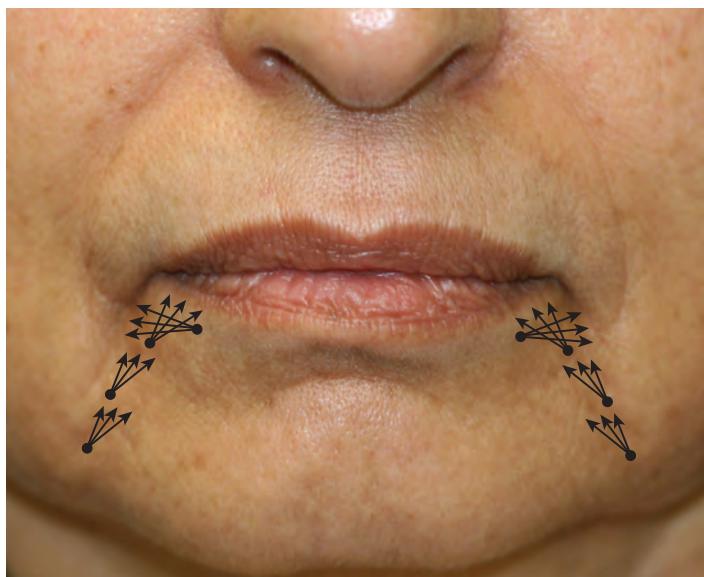


**FIGURE 2** ● Anesthesia for marionette line dermal filler treatment.

- Both lines are anesthetized using six injections of 0.1 mL for a total volume of 0.6 mL (Fig. 2).
- See Injectable Anesthetics in the Anesthesia section for additional information on local infiltration methods.
- Sensitivity increases with proximity to the lip and injections are started at the inferior portion of the marionette lines.
- **Topical anesthetic.** Benzocaine:lidocaine:tetracaine (BLT) may be used as an alternative for patients with high pain thresholds (see Topical Anesthetics in the Anesthesia section).

## Dermal Filler Procedure Overview

- **Overview.** Two injection techniques are commonly used for treatment of marionette lines (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section):
  - **Fanning technique** is shown in Figure 3 for treatment of marionette lines, and this technique is demonstrated in this chapter.
  - **Cross-hatching technique** is shown in Figure 4 for treatment of marionette lines.
- **Number of injections.** There are one to three medial fanning injections per side depending on the length of the marionette line. Long marionette lines (Fig. 3), require three medial fanning injections whereas short lines may only require one medial fanning injection. The superior most medial fanning injection near the lip is overlaid by a lateral fanning injection. All injections are placed medial to the marionette lines.
- **Injection depth.** Dermal filler is injected in the mid- to deep dermis for treatment of marionette lines.
- **Cautions**
  - Overtreatment can result in undesirable contour changes of the lateral upper lip.
  - Overfilling the marionette line area with dermal filler can result in vascular compromise and possible necrosis.



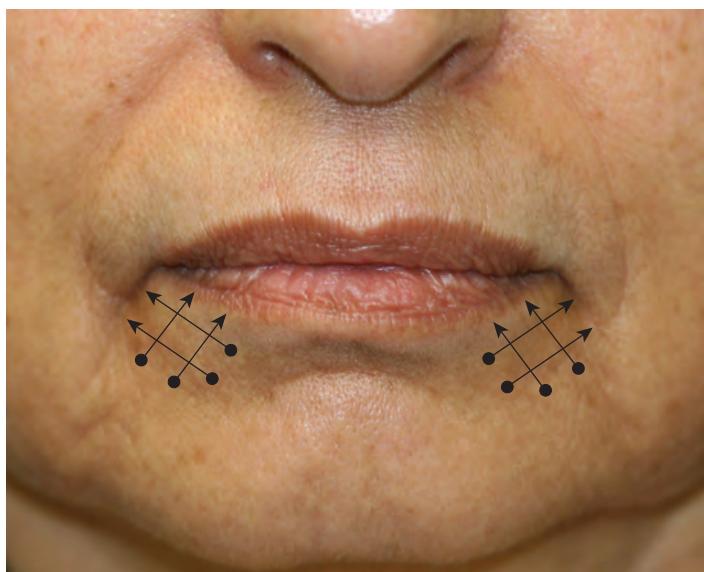
↗ = Dermal filler injection

**FIGURE 3** ● Fanning technique for dermal filler treatment of marionette lines.

## Performing the Procedure: Dermal Filler Treatment of Marionette Lines

### Anesthesia

1. Clean and prepare the skin in the marionette line area with alcohol.
2. Inject buffered lidocaine-epinephrine solution subcutaneously as shown in Figure 2.
3. Allow a few minutes for anesthesia.



↗ = Dermal filler injection

**FIGURE 4** ● Cross-hatching technique for dermal filler treatment of marionette lines.

## Dermal Filler

1. Position the patient at a 60 degree reclined position.
2. Prepare the marionette line area with alcohol.
3. The provider is positioned on the same side as the marionette line to be injected.
4. Attach a 30-gauge,  $\frac{1}{2}$ -inch needle to the prefilled HA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. The first medial fanning injection is at the inferior portion of the marionette line. Determine the injection point by laying the needle on the skin, parallel and just medial to the marionette line, such that the needle tip is 1 mm below lower lip. The injection point is at the needle hub (Fig. 5A).
7. Insert the needle at a 30-degree angle to the skin, direct it superiorly toward the lip and advance to the needle hub. Apply firm and constant pressure on the syringe plunger while gradually withdrawing needle to inject a linear thread of filler in the mid- to deep dermis. Without fully withdrawing the needle from the skin, redirect the needle medially using small angulations, advance the needle to the hub again and repeat until desired correction is achieved. Ensure dermal filler placement is contiguous. This is referred to as medial fanning (Figs. 5B, 5C, and 5D).
8. The second medial fanning injection is approximately 1 cm inferior to the first injection and placed as described above.
9. The third medial fanning injection is approximately 1 cm inferior to the second injection and placed as described above.
10. The lateral fanning injection is placed just below the border of the lower lip. Determine the injection point by laying the needle on the skin, parallel and just inferior to the lower lip, such that the needle tip is 1 mm medial to the marionette line. The injection point is at the needle hub (Fig. 6A).
11. Insert the needle at a 30-degree angle to the skin, direct it laterally toward the corner of the lips, advanced to the needle hub and fan inferiorly (Figs. 6B and 6C).
12. Compress the treatment area with the thumb on the skin and first finger intraorally, to smooth any visible or palpable bumps of filler product. If bumps do not easily compress, the area may be moistened with water and stretched between the provider's fingers. Additional swelling and bruising commonly occur after compression and manipulation of filler product.
13. Repeat the above injections for the contralateral side of the face.

## Tips

- Avoid placing filler product in the superficial dermis as this may result in an undesirable visible ridge of filler, which does not readily compress.
- Avoid treating lateral to the marionette lines as this can accentuate marionette lines.
- Watch for tissue blanching. If ischemia occurs, manage as described in the Complications section.

## Results

- Reduction of marionette lines is immediately evident at the time of treatment. Figure 1 shows a 69-year-old woman with moderate marionette lines before (A) and 4 weeks after (B) treatment with 1.6-mL HA-lidocaine filler, Juvederm Ultra Plus XC.



A



B



C

**FIGURE 5** ● Medial fanning for marionette lines dermal filler treatment: needle insertion point determination (**A**) and injection technique (**B, C, D**).



**FIGURE 5** (Continued)

## Duration of Effects and Subsequent Treatments

- Visible correction of marionette lines typically lasts 9 months to 1 year after treatment.
- Subsequent treatment with dermal filler is recommended when the volume of dermal filler product is visibly diminished and the marionette lines become more evident, prior to their pretreatment appearance.

## Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for reduction of marionette lines. Common issues reported by patients during this time include the following:

- **Bruising, swelling, erythema, and tenderness.** See Follow-ups and Management in the Introduction and Foundation Concepts section.
- **Persistent marionette lines.** Patients should be assessed for the following:
  - **Static marionette lines.** Additional dermal filler may be necessary if a volume deficit persists. Typically 0.4–0.8 mL HA-lidocaine will achieve the desired result.
  - **Dynamic marionette lines.** Combination treatment with botulinum toxin may be required to achieve optimal results in patients with dynamic marionette lines, see Combining Aesthetic Treatments below.

## Complications and Management

- General dermal filler complications and management are reviewed in the Complications section
- Ischemia and tissue necrosis

**Ischemia** in the marionette line area is typically due to overfilling the tissue rather than vascular occlusion. It usually presents painlessly, and is visible as immediate blanching. Ischemia is managed urgently as it can rapidly progress to **tissue necrosis**.



**FIGURE 6** ● Lateral fanning for mental crease dermal filler treatment: injection point determination (**A**) and injection technique (**B, C**).

In the marionette line area this can usually be managed by discontinuing injection and firmly massaging the blanched tissue with the first finger inside the mouth and thumb on the skin. Discontinue massage once the tissue is pink. Further management strategies are discussed in the Complications section. Modify the postprocedure patient instructions, to avoid icing the area that had vascular compromise.

## Combining Aesthetic Treatments and Maximizing Results

- **Botulinum toxin.** Some patients excessively contract the depressor anguli oris muscles which contribute to formation of marionette lines. Combining dermal filler treatment of marionette lines with botulinum toxin treatment of the depressor anguli oris muscles can improve reduction of marionette lines.
- **Dermal filler in adjacent areas.** Patients requiring marionette line dermal filler treatment may also require treatment of the extended mental crease area. If this adjacent area has a volume deficit, concurrent treatment with the marionette lines can enhance results (see Extended Mental Crease chapter).
- **Dermal filler layering.** Although moderate to severe marionette lines can be treated with an HA dermal filler, using the techniques described in this chapter, improved outcomes can often be achieved by layering two types of dermal fillers. Layering is considered an advanced procedure, which consists of placing a dermal filler with more structural support in areas of deep dermal volume loss, and overlaying it with a thinner, more malleable dermal filler to smooth superficial fine lines and wrinkles (see Layering Dermal Fillers chapter).

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, the injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$500 to \$800 per syringe of 0.8 mL HA for treatment of marionette lines.





## Mental Crease



A



B

**FIGURE 1** ● Mental crease before (A) and 4 weeks after (B) dermal filler treatment, using hyaluronic acid.

The mental crease can become more prominent with lower face aging, and dermal filler treatment is frequently performed for the reduction of this crease.

### Indications

- Mental crease

### Anatomy

- **Wrinkles, folds, and contours.** The mental crease, or labiomental crease, is a horizontal line just above the chin (see Dermal Filler Anatomy section, Figs. 1 and 2). Mental crease formation is due to many factors including soft tissue volume loss and dermal atrophy, reduced skin elasticity, biometric volume loss with resorption of mandibular bone and tooth alveolar processes, and hyperdynamic lower face musculature.

### Patient Assessment

- Patients with mild, moderate, and severe static mental creases are candidates for dermal filler treatments.

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.

## Treatment Goals

- Reduction of the mental crease without full effacement to preserve the chin contour.

## Recommended Dermal Filler Product

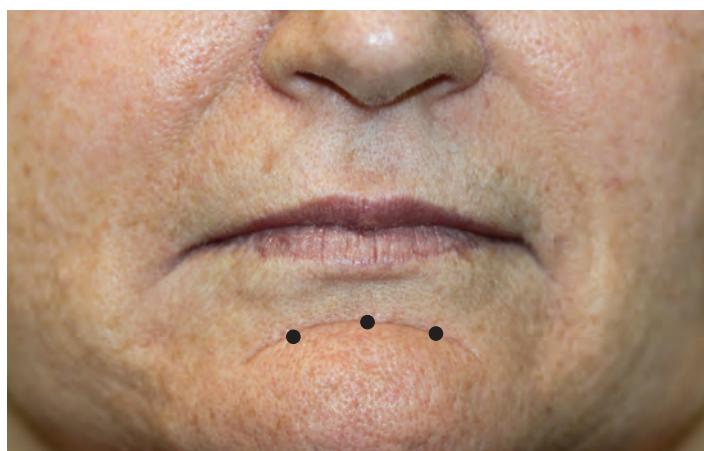
- Basic hyaluronic acid (HA) dermal filler products that have lidocaine (HA-lidocaine) are recommended for treatment of the mental crease, such as Juvederm® Ultra XC, Juvederm® Ultra Plus XC or Restylane-L® (see Introduction and Foundation Concepts in Basic and Advanced Procedures section).
- This chapter describes treatment of the mental crease with Juvederm Ultra Plus XC (HA-lidocaine).

## Dermal Filler Treatment Volumes

- The estimated HA dermal filler volume necessary for treatment is based on the patient's observed facial anatomy and volume loss in the treatment area. Typical starting volumes are listed as follows:
  - Mild mental creases typically require 0.4 mL HA-lidocaine.
  - Moderate to severe mental creases typically require 0.8 mL HA-lidocaine.

## Equipment for Anesthesia

- Local infiltration injection supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered (referred to as buffered 2% lidocaine-epinephrine solution)
- 30-gauge,  $\frac{1}{2}$ -inch needle



● = 0.1 mL Lidocaine

**FIGURE 2** ● Anesthesia for mental crease dermal filler treatment.

## Equipment for Dermal Filler Procedure

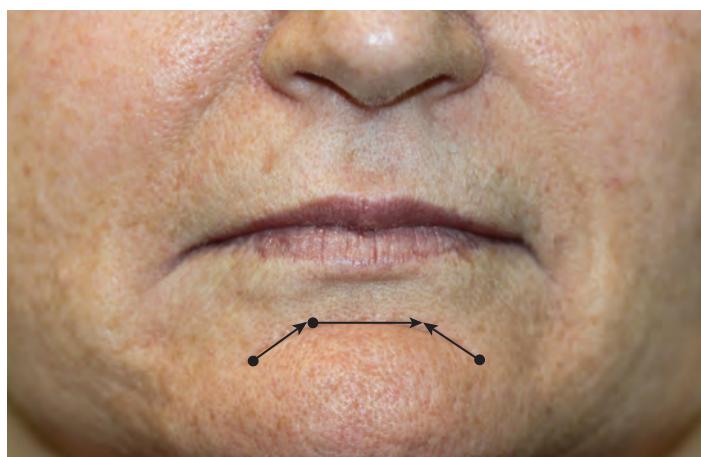
- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- Lidocaine HCl 2% with epinephrine 1:100,000 (referred to as buffered 2% lidocaine-epinephrine solution)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Anesthesia Overview

- **Local lidocaine infiltration.** Buffered 2% lidocaine-epinephrine solution can be used to achieve anesthesia for nasolabial folds.
- The mental crease is anesthetized using three injections of 0.1 mL for a total volume of 0.3 mL (Fig. 2). See Injectable Anesthetics in the Anesthesia section for additional information on local infiltration methods. Sensitivity increases toward the midline of the face, and injections are started at the lateral portion of the crease.
- **Topical anesthetic.** Benzocaine:lidocaine:tetracaine (BLT) may be used as an alternative for patients with high pain thresholds (see Topical Anesthetics in the Anesthesia section).

## Dermal Filler Procedure Overview

- **Overview.** An overview of injection points and injection technique for treatment of the mental crease using a HA dermal filler is shown in Figure 3.
- **Number of injections.** There are three linear thread injections (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section). Injections start at the lateral most portion of the mental crease and proceed medially.
- **Injection depth.** Dermal filler is injected in the mid- to deep dermis for treatment of the mental crease.
- **Cautions.** This area is not notable for major cautions.



**FIGURE 3** ● Overview of mental crease dermal filler injections.

## Performing the Procedure: Dermal Filler Treatment of the Mental Crease

### Anesthesia

1. Clean and prepare the skin in the mental crease area with alcohol.
2. Inject buffered 2% lidocaine-epinephrine solution subcutaneously as shown in Figure 2.
3. Allow a few minutes for anesthesia.

### Dermal Filler

1. Position the patient in a 60-degree reclined position.
2. Clean and prepare the skin of the mental crease area with alcohol.
3. The provider is positioned on the same side as the mental crease to be injected.
4. Attach a 30-gauge,  $\frac{1}{2}$ -inch needle to the prefilled HA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. The first injection point is at the inferior lateral portion of the mental crease. Determine the first injection point by laying the needle on top of the skin such that the tip is at one end of the horizontal mental crease. The injection point is at the needle hub (Fig. 4A).
7. Insert the needle at a 30-degree angle to the skin, directing it superiorly and medially following the contour of the mental crease and advance to the needle hub. Apply firm and constant pressure on the syringe plunger while gradually withdrawing needle to inject a linear thread of filler in the mid- to deep dermis (Fig. 4B).
8. The second injection point is approximately 1 cm superior and medial to the first injection point and filler is placed as above, using the linear thread technique to treat the center portion of the mental crease (Fig. 5).
9. Reposition to the opposite side of the patient for the remaining injection.
10. The third injection point is on the opposite side of the mental crease at the inferior lateral portion. The needle is directed superiorly and medially following the contour of the mental crease and filler is placed as above, using the linear thread technique (Fig. 6).
11. Compress the treatment area using both thumbs on the skin and apply firm pressure from medial to lateral, to smooth any visible or palpable bumps of filler product.

## Results

- Reduction of the mental crease is immediately evident at the time of treatment. Figure 1 shows a 47-year-old woman with a moderate mental crease before (A) and 4 weeks after (B) treatment with 0.8-mL HA dermal filler, Juvederm Ultra Plus.

## Duration of Effects and Subsequent Treatments

- Visible correction of the mental crease typically lasts 9 months to 1 year after treatment.
- Subsequent treatment with dermal filler is recommended when the volume of dermal filler product is visibly diminished and the mental crease becomes more evident, prior to the pretreatment appearance.



A



B

**FIGURE 4** ● First injection for mental crease dermal filler treatment: injection point determination (**A**) and threading technique (**B**).



**FIGURE 5** ● Second injection for mental crease dermal filler treatment.



**FIGURE 6** ● Third injection for mental crease dermal filler treatment.

## Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for reduction of the mental crease. Common issues reported by patients during this time include the following:

- **Bruising, swelling, erythema, and tenderness.** See Follow-ups and Management in the Introduction and Foundation Concepts section for recommendations and management strategies.
- **Persistent mental crease.** Patients should be assessed for the following:
  - **Static mental crease.** Additional dermal filler may be necessary if a volume deficit persists. Typically 0.4 mL HA-lidocaine will achieve the desired result.
  - **Dynamic mental crease.** Combination treatment with botulinum toxin may be required to achieve optimal results for a deep mental crease in patients with hyperdynamic mentalis muscles, see Combining Aesthetic Treatments below.

## Complications and Management

- General dermal filler complications and management are reviewed the Complications section.

## Combining Aesthetic Treatments and Maximizing Results

- **Botulinum toxin.** Some patients have excessive contraction of the mentalis muscle resulting in a deep mental crease. Combining dermal filler treatment of the mental crease with botulinum toxin treatment of the mentalis muscle can improve reduction of the mental crease in these patients.
- **Dermal filler in adjacent areas.** Patients requiring mental crease treatment may also require treatment of the extended mental crease and/or chin areas. If these adjacent areas have volume deficits, concurrent treatment with the mental crease can enhance results (see Extended Mental Crease and Chin Augmentation chapters).

- **Dermal filler layering.** Although moderate to severe mental creases can be treated with an HA dermal filler using the techniques described in this chapter, improved outcomes can often be achieved by layering two types of dermal fillers. Layering is considered an advanced procedure, which consists of placing a dermal filler with more structural support in areas of deep dermal volume loss and overlaying it with a thinner, more malleable dermal filler to smooth superficial fine lines and wrinkles (see Layering chapter).

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, the injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$500 to \$800 per syringe of 0.8 mL HA for treatment of the mental crease.



## Extended Mental Creases



**FIGURE 1** ● Extended mental crease lateral view before (A) and 4 weeks after (B) dermal filler treatment using calcium hydroxylapatite.

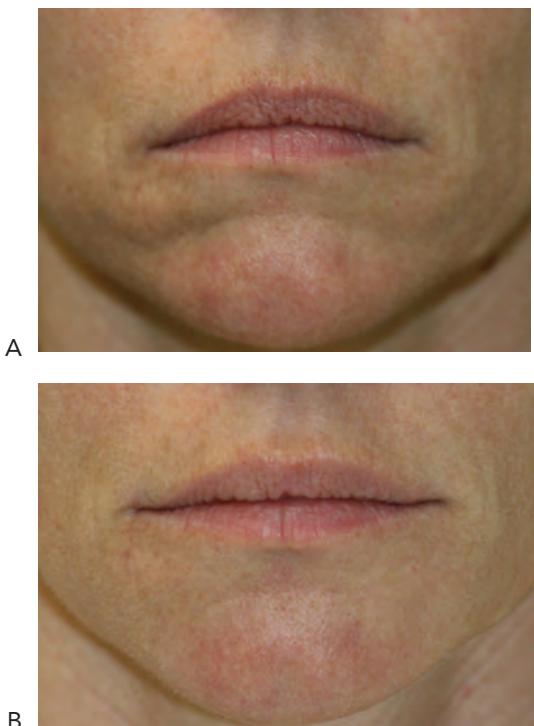
Extended mental creases can become visible with aging of the lower face, and project sadness or a dour appearance. This area exhibits deep volume loss and correction is achieved with dermal filler products that offer more structural support. Therefore, reduction of the extended mental crease is considered an advanced dermal filler procedure.

### Indications

- Extended mental creases

### Anatomy

- **Wrinkles, folds, and contours.** The extended mental crease is a triangular shaped area of volume loss that lies inferior to the oral commissure. It is bounded laterally by the marionette line, medially by the mental crease, and inferiorly by the chin (Fig. 2A) (see Dermal Filler Anatomy section, Figs. 1 and 2). Extended mental crease formation results from many factors, including soft-tissue volume loss, dermal atrophy, and biometric volume loss due to resorption of mandibular bone and tooth alveolar processes.



**FIGURE 2** ● Extended mental crease front view before (**A**) and 4 weeks after (**B**) dermal filler treatment using calcium hydroxylapatite.

## Patient Assessment

- Patients with mild, moderate, and severe extended mental creases are candidates for dermal filler treatments.

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.

## Treatment Goals

- Full effacement of extended mental creases.

## Recommended Dermal Filler Product

- This is an area of deep volume loss and is ideally treated with advanced dermal filler products that offer more structural support, such as Radiesse® (calcium hydroxylapatite [CaHA]), or Perlane-L® (hyaluronic acid [HA]). Juvederm® Ultra Plus, one of the basic HA filler products, provides moderate structural support and can also be used (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section).
- This chapter describes treatment of extended mental creases with CaHA (Radiesse), in particular CaHA that has been mixed with a small amount of lidocaine (CaHA-lidocaine). CaHA-lidocaine has reduced viscosity and a mild anesthetic effect (See Calcium Hydroxylapatite and Lidocaine Preparation in the Introduction and Foundation Concepts section).

## Dermal Filler Treatment Volumes

- The estimated CaHA-lidocaine (Radiesse) dermal filler volume necessary for treatment is based on the patient's observed facial anatomy and volume loss in the treatment area. Typical starting volumes are listed as follows:
  - Mild extended mental creases typically require a total volume of 0.8-mL CaHA-lidocaine.
  - Moderate-to-severe extended mental creases typically require a total volume of 1.6-mL CaHA-lidocaine.

## Equipment for Anesthesia

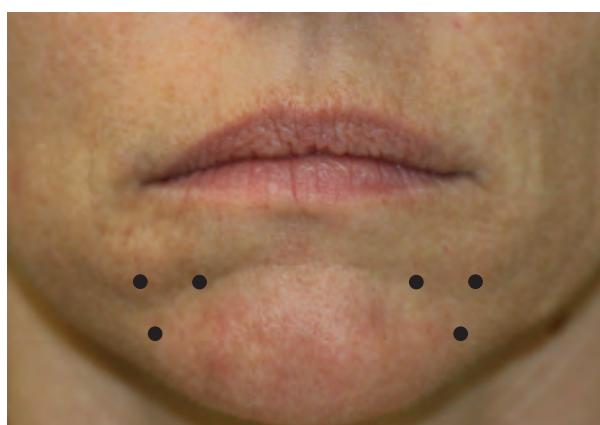
- Local infiltration injection supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered (referred to as buffered 2% lidocaine-epinephrine solution)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Equipment for Dermal Filler Procedure

- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- 27-gauge,  $1\frac{1}{4}$ -inch needle

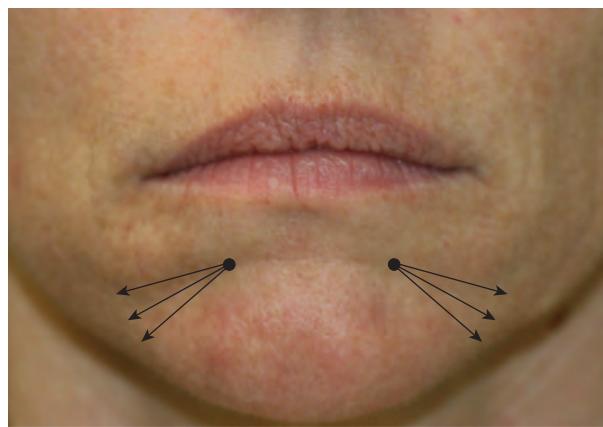
## Anesthesia Overview

- Local lidocaine infiltration.** Buffered 2% lidocaine-epinephrine solution can be used to achieve anesthesia for nasolabial folds. The extended mental crease is anesthetized using six injections of 0.1 mL for a total volume of 0.6 mL (Fig. 3). See Injectable Anesthetics in the Anesthesia section for additional information on local infiltration methods. Sensitivity increases with proximity to the lip, and injections are started at the lateral portion of the crease.



● = 0.1 mL Lidocaine

**FIGURE 3** ● Anesthesia for extended mental crease dermal filler treatment.



↗ = Dermal filler injection

**FIGURE 4** Overview of extended mental crease dermal filler injections.

## Dermal Filler Procedure Overview

- **Overview.** An overview of injection points and injection technique for treatment of the extended mental crease using CaHA-lidocaine dermal filler is shown in Figure 4.
- **Number of injections.** One injection per side is administered using the fanning technique, angulating superiorly (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section).
- **Injection depth.** Dermal filler is injected in the deep dermis for treatment of the extended mental creases.
- **Cautions.** This area is not notable for major cautions.

## Performing the Procedure: Dermal Filler Treatment of Extended Mental Crease

### Anesthesia

1. Clean and prepare the skin in the extended mental crease area with alcohol.
2. Inject buffered 2% lidocaine-epinephrine solution subcutaneously as shown in Figure 3.
3. Allow a few minutes for anesthesia.

### Dermal Filler

1. Position the patient in a 60-degree reclined position.
2. Clean and prepare the skin of the mental crease area with alcohol.
3. The provider is positioned on the opposite side of the extended mental crease to be injected.
4. Attach a 27-gauge, 1¼-inch needle to the CaHA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle from popping off when plunger pressure is applied.
5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. The injection point is at the medial portion of the extended mental crease where it approaches the lateral edge of the mental crease. Determine the first injection point



**FIGURE 5** Extended mental crease dermal filler treatment: needle insertion point determination (**A**) and injection technique (**B**).

- by laying the needle above the skin such that the needle hub is at the lateral mental crease. The injection point is at the needle hub (Fig. 5A).
7. Insert the needle at a 30-degree angle to the skin, directing it laterally toward the marionette line, and advance to the needle hub (Fig. 5B). Apply firm and constant pressure on the syringe plunger while gradually withdrawing the needle to inject a linear thread of filler in the deep dermis. Fan the needle inferiorly without fully withdrawing the needle from the skin using small angulations to ensure dermal filler placement is contiguous. Repeat until desired correction is achieved.
  8. Reposition to the opposite side of the patient for the remaining injection and repeat as above.
  9. Compress the treatment areas using both thumbs on the skin and apply firm pressure from medial to lateral, to smooth any visible or palpable bumps of the filler.

## Tip

- Avoid placing filler too superficially as dermal filler products with more structural support can be seen as visible bumps.

## Results

- Reduction of the extended mental crease is immediately evident at the time of treatment. Figures 1 and 2 show a 48-year-old woman with a moderate-to-severe extended mental crease before (A) and 4 weeks after (B) treatment with 1.4 mL of a CaHA-lidocaine dermal filler, Radiesse.

## Duration of Effects and Subsequent Treatments

- Visible correction of the extended mental crease treated with CaHA-lidocaine typically lasts for 1–1½ years.
- Subsequent treatment with the dermal filler is recommended when the volume of the dermal filler product is visibly diminished and the extended mental creases become more evident, prior to their pretreatment appearance.

## Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for reduction of the mental crease. Common issues reported by patients during this time include:

- **Bruising, swelling, erythema, and tenderness.** See Follow-ups and Management in the Introduction and Foundation Concepts section for recommendations and management strategies.
- **Persistent extended mental crease.** Additional dermal filler may be necessary if a volume deficit persists. Typically 0.3–0.4 mL CaHA-lidocaine will achieve the desired result. If possible, use ice or topical anesthetic with touch-up to reduce tissue distortion that can occur with local lidocaine injection.

## Complications and Management

- General dermal filler complications and management are reviewed in Complications section.

## Combining Aesthetic Treatments and Maximizing Results

- **Dermal filler in adjacent areas.** Patients requiring extended mental crease treatment may also have volume deficits in the mental crease, chin, and/or marionette line areas. If these adjacent areas have volume deficits, concurrent treatment of the extended mental crease may enhance results (see Mental Crease, Chin Augmentation, and Marionette Line chapters).

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, the injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$550 to \$900 per syringe of 0.8 mL CaHA (Radiesse) for treatment of the extended mental crease.

# Chin Augmentation



**FIGURE 1** ● Recessed chin before (A) and 4 weeks after (B) dermal filler chin augmentation treatment, using calcium hydroxylapatite.

Treatment of a recessed chin has traditionally been a surgical procedure utilizing chin implants. This undesirable contour can also be effectively treated with dermal fillers. Products which offer more structural support to the tissues are used for chin augmentation and this is, therefore, considered an advanced dermal filler procedure.

## Indications

- Recessed, flat chin

## Anatomy

- **Wrinkles, folds, and contour changes.** Two basic chin shapes can be seen from the anterior view: triangular (Fig. 2A) and square (Fig. 2B). Typically, men have square-shaped chins and women have triangular chins. However, both shapes can be seen in either gender and can exhibit undesirable recessed or flattened contours.

## Patient Assessment

- Chin projection is assessed from the anterior and lateral views. In profile, the anterior-most projection of the chin should be just slightly behind the anterior projection of the lower lip. The chin should appear rounded and not flat.



**FIGURE 2** ● Triangular (A) and square (B) chin shapes.

- Dermal filler chin augmentation is indicated for a recessed or flattened chin due to soft-tissue changes, but not for dental and skeletal conditions, such as excessive overbite or micrognathia. Excessive overbite can be assessed by having the patient bite down and observing the dentition for malocclusion.

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.
- Very small or severely recessed chins seen with conditions such as micrognathia, severe malocclusion, and craniofacial abnormalities.

## Treatment Goals

- Increased anterior projection and rounding of the chin.

## Recommended Dermal Filler Product

- This is an area of deep volume loss and is ideally treated with advanced dermal filler products that offer more structural support, such as Radiesse® (calcium hydroxyapatite [CaHA]) or Perlane-L® (hyaluronic acid [HA]) (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section).
- This chapter describes chin augmentation with CaHA (Radiesse). CaHA is not mixed with lidocaine for maximum structural support.

## Dermal Filler Treatment Volumes

- The estimated CaHA (Radiesse) dermal filler volume necessary for treatment is based on patients' observed facial anatomy and volume loss in the treatment area. Typical starting volumes are listed as follows:
  - Mild chin recession and flattening typically requires a total volume of 0.6–0.8 mL CaHA.

- Moderate-to-severe chin recession and flattening typically requires a total volume of 1.3–1.5 mL CaHA.

## Equipment for Anesthesia

- Local infiltration injection supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered (referred to as buffered 2% lidocaine-epinephrine solution)
- 30-gauge,  $\frac{1}{2}$ -inch needle
- General topical anesthetic supplies (see Equipment for Topical Anesthetics in the Anesthesia section)
- Benzocaine:lidocaine:tetracaine (BLT) ointment

## Equipment for Dermal Filler Procedure

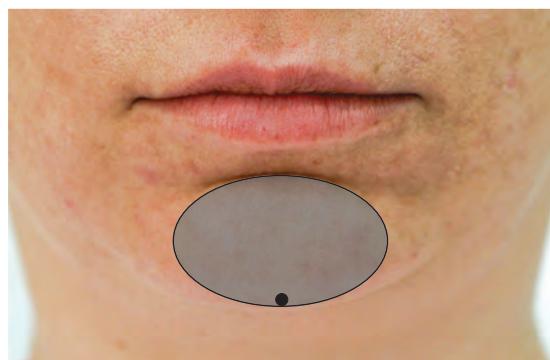
- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- 27-gauge,  $1\frac{1}{4}$ -inch needle

## Anesthesia Overview

- Local lidocaine infiltration.** Buffered 2% lidocaine-epinephrine solution can be used to achieve anesthesia for the needle insertion site.
  - Triangular chin** needle insertion sites are anesthetized using one injection of 0.1 mL buffered 2% lidocaine-epinephrine solution (Fig. 3).
  - Square chin** needle insertion sites are anesthetized using two injections of 0.1 mL for a total of 0.2 mL buffered 2% lidocaine-epinephrine solution.
- Topical anesthetic.** BLT is used on the remainder of the chin (see Topical Anesthetics in the Anesthesia section).

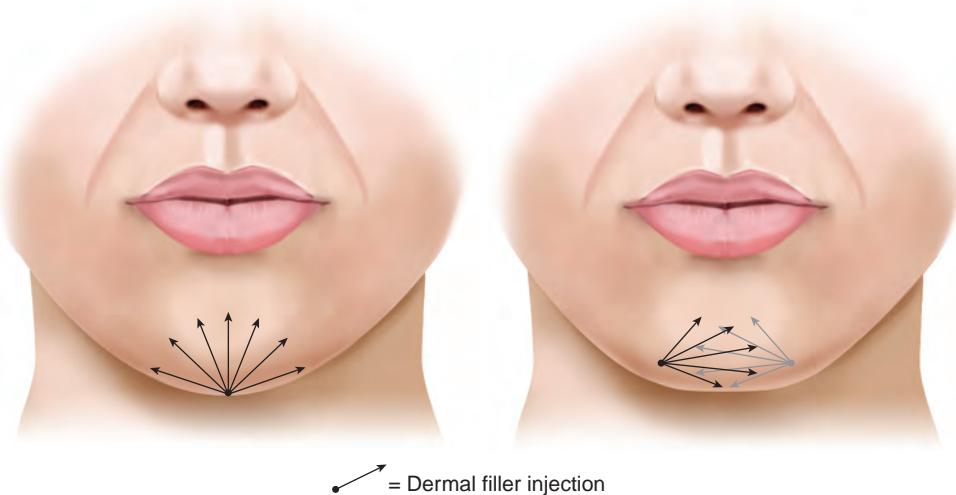
## Overview of Dermal Filler Procedure

- Overview.** Different methods are used to treat triangular versus square-shaped chins. An overview of chin augmentation injection points and injection techniques are shown



■ = Topical anesthetic      ● = 0.1 mL Lidocaine

**FIGURE 3** Anesthesia for chin augmentation dermal filler treatment.



A

B

**FIGURE 4** ● Overview of chin augmentation dermal filler injections for triangular (**A**) and square-shaped (**B**) chins.

for triangular (Fig. 4A) and square-shaped (Fig. 4B) chins. This chapter demonstrates dermal filler injection for a triangular chin.

- **Number of injections.** There are two fanning injections (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section) for a triangular chin.
- **Injection depth.** Dermal filler is injected in the deep dermis for chin augmentation.
- **Cautions.** This area is not notable for major cautions.

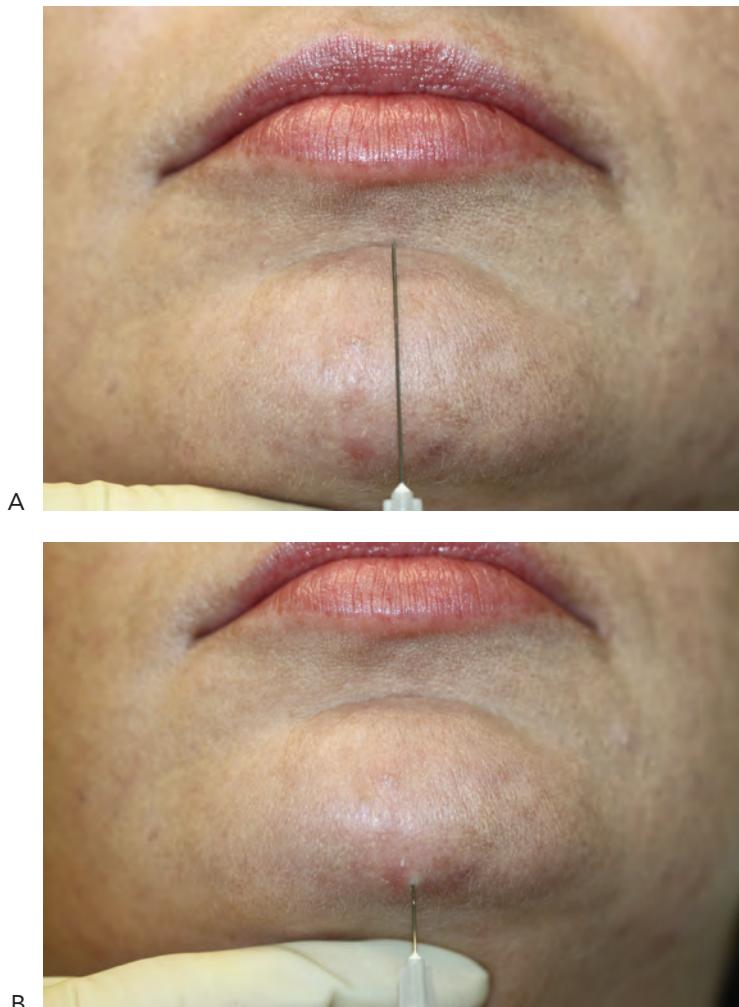
## Performing the Procedure: Dermal Filler Chin Augmentation

### Anesthesia

1. Clean and prepare the skin of the chin with alcohol.
2. Inject 0.1 mL buffered 2% lidocaine-epinephrine solution subcutaneously, as shown in Figure 3.
3. Apply 0.5 g BLT in a thin layer over the chin (Fig. 3); occlusion with a plastic wrap is not necessary.
4. Remove BLT 15–30 minutes after application using alcohol.

### Dermal Filler

1. Position the patient in a 45-degree reclined position.
2. Clean and prepare the skin of the chin with alcohol.
3. The provider is positioned on the opposite side of the chin to be injected.
4. Attach a 27-gauge, 1¼-inch needle to the CaHA dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle from popping off when plunger pressure is applied.



**FIGURE 5** Dermal filler chin augmentation: needle insertion point determination (**A**) and injection technique (**B**).

5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. The injection point is in the midline just inferior jaw line. Determine the first injection point by laying the needle on top of the chin such that the needle tip reaches the circumference of the chin at the 12 o'clock position. The injection point is at the needle hub (Fig. 5A).
7. Insert the needle and direct it superiorly toward the lower lip at the 12 o'clock position (Fig. 5B). Advance the needle, taking care to follow the curve of the chin. Apply firm and constant pressure on the syringe plunger while gradually withdrawing the needle to inject a linear thread of filler in the deep dermis. When placing dermal filler in the *left* half of the chin, fan the needle *clockwise* without fully withdrawing the needle from the skin, using small angulations to ensure dermal filler placement is contiguous. Continue fanning until the jaw line is reached and then withdraw the needle.
8. Reposition to the opposite side of the patient.

9. The needle is reinserted at the same injection point in the midline, just inferior the jaw line. When placing dermal filler in the *right* half of the chin, fan the needle *counterclockwise* until the jaw line is reached and then withdraw the needle.
10. Compress the treatment area with both thumbs on the skin using firm pressure from medial to lateral and around the perimeter of the chin, to smooth any visible or palpable bumps of filler.
11. Palpate the treatment area to determine whether there are any skipped areas where filler is not palpable. If necessary, insert the needle at the same injection site and inject linear threads until the desired correction is achieved. Occasionally, a different angle of injection is required to fill skipped areas and the needle can be inserted anywhere in the chin area to achieve confluent filler placement.
12. Compress the treatment area again as described above.

## Tip

- Avoid placing the filler too superficially as dermal filler products with more structural support can be seen as visible bumps.

## Results

- Chin augmentation is immediately evident at the time of treatment. Figure 1 shows a 34-year-old woman with a severely flattened and recessed chin before (A) and 4 weeks after (B) treatment with 1.5 mL of a CaHA dermal filler, Radiesse.

## Duration of Effects and Subsequent Treatments

- Chin augmentation with CaHA typically lasts for 1–1½ years.
- Subsequent treatment with the dermal filler is recommended when the volume of the filler is visibly diminished and the chin contour begins to flatten or become recessed again, prior to the pretreatment appearance.

## Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for adequacy of chin augmentation. Common issues reported by patients include:

- **Bruising, swelling, erythema, and tenderness.** See Follow-ups and Management in the Introduction and Foundation Concepts section for recommendations and management strategies.
- **Asymmetry of the chin.** Additional dermal filler may be necessary if a volume deficit is visible. A typical touch-up procedure requires 0.2–0.3 mL CaHA to address small volume deficits. If possible, use ice or topical anesthetic for anesthesia when performing a touch-up procedure to reduce tissue distortion that can occur with local lidocaine infiltration.

## Complications and Management

- General dermal filler complications and management are reviewed in Complications section.

## Combining Aesthetic Treatments and Maximizing Results

- **Botulinum toxin.** Some patients have excessive contraction of the mentalis muscle, resulting in chin flattening and a deep mental crease. Combining dermal filler chin augmentation with botulinum toxin treatment of the mentalis muscle can improve chin augmentation results in these patients.
- **Dermal filler in adjacent areas.** Patients requiring chin augmentation may also have volume deficits in the mental crease and/or extended mental crease areas. If these adjacent areas have volume deficits, concurrent treatment with chin augmentation can enhance results (see Mental Crease and Extended Mental Crease chapters).

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, the injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$650 to \$1200 per syringe of 1.5 mL CaHA for chin augmentation.



## Lip Border



**FIGURE 1** Lip augmentation before (A), immediately after (B), and 1 week after dermal filler treatment (C), using hyaluronic acid.

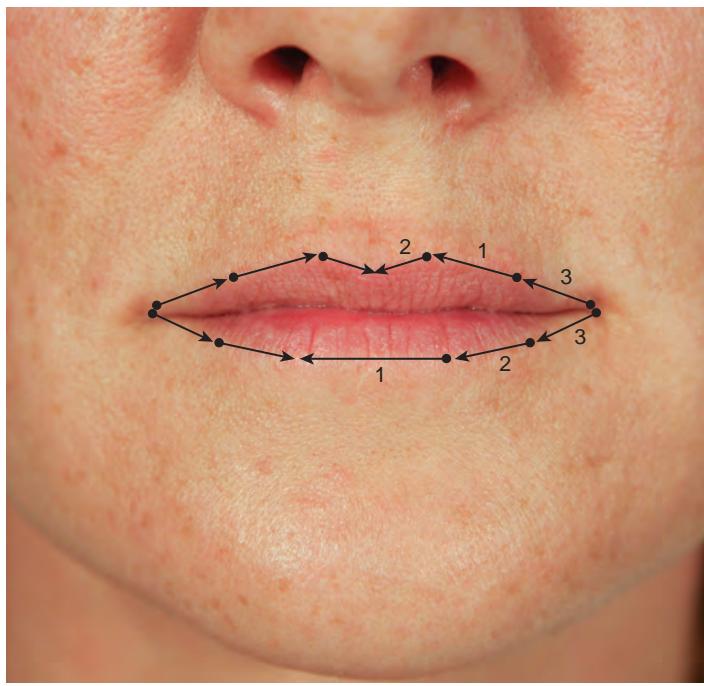
Using proper technique and products, dermal filler treatments can enhance lip shape and volume in a natural way. These procedures can benefit patients with less defined lip shape and diminished lip volume from aging; as well as younger patients seeking lip enhancement.

### Indications

- Lip atrophy

### Anatomy

- **Wrinkles, folds, and contours.** The vermillion border is the demarcation between the less keratinized pink vermillion of the lip epidermis, and the highly keratinized facial skin epidermis. The Cupid's bow is the central portion of the upper lip with two peaks at the philtral columns. The Cupid's bow contributes to the natural shape of the lip and is typically enhanced as part of dermal filler lip augmentation (see Dermal Filler Anatomy section, Figs. 1 and 2).



**FIGURE 2** ● Overview of lip border dermal filler injections.

## Patient Assessment

- Careful consultation and examination using a mirror is necessary to determine lip features that the patient would like enhanced, discuss realistic expectations and advise about aesthetic outcomes. The following points are typically included:
  - A given lip shape can only be enhanced with dermal filler treatment, it cannot be altered into another lip shape.
  - Defining the lip shape and the line around the lips with lip border treatments involves dermal filler placement in the vermillion border.
  - Enhancing the lip body involves placement of dermal filler in the mucosa of the lip.
  - Lip augmentation often combines enhancement of both the lip border and the lip body (see Lip Body chapter).

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.
- **Very thin, diminutive upper lip.** Dermal filler treatment of this lip architecture can result in an unnatural anterior projection of the upper lip or a “duck” lip.
- **Braces.** Braces on the teeth can distort lip projection and it is best to avoid dermal filler treatment if they are present.

## Treatment Goals

- Natural fuller appearance to the lip with slight eversion of the vermillion border to enhance lip shape without excessive anterior projection. Lip fullness should be congruent with the patient’s age.

## Recommended Dermal Filler Product

- Hyaluronic acid (HA) dermal filler products that have lidocaine (HA-lidocaine) are recommended for treatment of the lip border. Products with a soft tissue filling effect, such as Juvederm® Ultra XC (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section), are recommended for patients with atrophic lips. Products with firmer tissue filling effects, such as Juvederm® Ultra Plus XC and Restylane-L®, are recommended for younger patients (ages 20s–30s) who have greater baseline tissue density and lip volume.
- This chapter describes treatment of the lip border using Juvederm Ultra Plus XC (HA-lidocaine).

## Dermal Filler Treatment Volumes

- The estimated HA dermal filler volume necessary for treatment is based on patients' observed facial anatomy and volume loss in the treatment area.
- Treatment of the upper and lower lip vermillion borders typically requires 0.6–0.8 mL Juvederm Ultra Plus XC, Juvederm Ultra XC, or Restylane-L.

## Equipment for Anesthesia

- Lip ring block supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered or unbuffered (referred to as 2% lidocaine-epinephrine solution)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Equipment for Dermal Filler Procedure

- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Anesthesia Overview

- **Lip ring block.** Adequate anesthesia of the lip prior to dermal filler injection is essential for successful lip border treatments. Patients usually require profound lip anesthesia. Dermal fillers formulated or mixed with lidocaine do not offer sufficient pain control for lip filler treatments and a lip ring block is required (see Lip Ring Block in the Anesthesia section).

## Dermal Filler Procedure Overview

- **Overview.** An overview of injection points and injection technique for dermal filler treatment of the lip border shown in Figure 2.
- **Number of injections.** There are six linear thread injections for the upper lip border and five linear thread injections for the lower lip border—a total of 11 injections (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section).

- **Injection depth.** Dermal filler injections are placed in the superficial dermis of the vermillion border.
- **Cautions**
  - Observe filler volumes closely during treatment and administer equal volumes on both sides of the lips, unless gross asymmetry is present prior to treatment.
  - Lip edema can occur rapidly. At the completion of treatment, the side injected first may appear larger due to edema. If asymmetry is evident at the completion of treatment, and injection volumes and palpable product have been consistent for both sides, then it is advisable to reassess symmetry at the follow-up visit once edema has resolved.
  - Avoid overfilling the lateral portion of the upper lip as this can result in undesired contour changes of the lip.
  - Dermal filler can tract outside of the vermillion border resulting in filler collections outside of the intended treatment area, in either the surrounding skin or to the lip mucosa.

## Performing the Procedure: Dermal Filler Treatment of the Lip Border

### Anesthesia

1. Clean and prepare the lips with alcohol, removing all lipstick if present.
2. Perform a lip ring block (see Ring Block in the Anesthesia section) as follows:
  - For the upper lip, use a total volume of 1.2 mL 2% lidocaine-epinephrine solution.
  - For the lower lip, use a total volume of 1.2 mL 2% lidocaine-epinephrine solution.
  - For the corners of the lips, use a total volume of 0.2 mL 2% lidocaine-epinephrine solution.
3. Wait 3–5 minutes for anesthesia.

### Dermal Filler Upper Lip Border

1. Position the patient in a 60-degree reclined position.
2. Prepare the lips with alcohol.
3. Attach a 30-gauge,  $\frac{1}{2}$ -inch needle to the prefilled HA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
4. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
5. The provider is positioned on the same side as the lip to be injected.
6. Identify the first injection point in the upper lip border by laying the needle against the vermillion border such that the needle tip ends at the ipsilateral peak of the Cupid's bow. The injection point is at the needle hub (Fig. 3A).
7. Insert the needle into the vermillion border at a 30-degree angle to the skin and direct it toward the ipsilateral peak of the Cupid's bow (Fig. 3B). Advance to the hub, then apply firm and constant pressure on the syringe plunger while gradually withdrawing needle to inject a linear thread of filler. The filler should flow easily into the vermillion border and a rolled border to the lip will be visible as the filler product is injected.



**FIGURE 3** • First injection for dermal filler treatment of the upper lip border: needle insertion point determination (**A**) and injection technique (**B**).

8. The second injection point in the upper lip border is at the ipsilateral peak of the Cupid's bow. Insert the needle and advance inferior-medially to the nadir of the Cupid's bow. Smoothly inject a small amount of filler as the needle is withdrawn (Fig. 4).
9. The third injection point in the upper lip border is one needle length lateral to the first injection point. The needle is inserted until the tip is adjacent to the linear thread from the previous injection, and filler is smoothly injected as the needle is withdrawn (Fig. 5).
10. Gently compress the lip with thumb on the skin and first finger intraorally, and slowly compress from medial to lateral along the length of the lip to smooth any visible or palpable bumps of filler product. If bumps do not easily compress, the area may be



**FIGURE 4** ● Second injection for dermal filler treatment of the upper lip border.

moistened with water and stretched between the provider's fingers. Additional swelling and bruising commonly occur after compression and manipulation of filler product.

11. Reposition to the opposite side of the patient and repeat the above injections for the contralateral upper lip vermillion border.

### Dermal Filler Lower Lip Border

1. Repeat steps 1–5 as above.
2. Identify the first lower lip border injection point by laying the needle against the vermillion border such that the length of the needle spans the center portion of the



**FIGURE 5** ● Third injection for dermal filler treatment of the upper lip border.



**FIGURE 6** ● First injection for dermal filler treatment of the lower lip border: needle insertion point determination (**A**) and injection technique (**B**).

lower lip; the needle hub is usually just lateral to the ipsilateral peak of the Cupid's bow. The injection point is at the needle hub (Fig. 6A).

3. The needle is inserted into the vermillion border at a 30-degree angle to the lip epidermis and directed along the vermillion border toward the opposite side. The needle is advanced to the hub and filler is smoothly injected as the needle is withdrawn (Fig. 6B).
4. The second lower lip border injection point is one needle length lateral to the first injection point. The needle is inserted to the hub and filler is smoothly injected as the needle is withdrawn (Fig. 7).
5. The third lower lip border injection point is at the corner of the lip. The needle is inserted until the tip is adjacent to the linear thread from the previous injection, and filler is smoothly injected as the needle is withdrawn (Fig. 8).
6. Gently compress the lip from medial to lateral as described earlier.
7. Reposition to the opposite side and repeat second and third injections as described earlier for the remainder of the lower lip vermillion border.
8. Proceed with lip body dermal filler injections if also augmenting this area (see Lip Body chapter).



**FIGURE 7** ● Second injection for dermal filler treatment of the lower lip border.

### Tips

- Filler should be smooth and confluent in the vermillion border. If there is a visible or palpable skipped area, inject this area using the above technique until filler product is contiguous and desired correction is achieved.
- If filler is seen outside of the vermillion border during injection, discontinue injection and compress the area until no product is visible outside of the vermillion border and then resume treatment.

### Results

- Lip augmentation is immediately evident at the time of treatment, and there usually is significant edema. Lips may appear overfilled and project anteriorly due to edema. Once edema resolves, lips will appear more defined with improved architecture and fullness



**FIGURE 8** ● Third injection for dermal filler treatment of the lower lip border.

and return to their anatomic position. Figure 1 shows a 38-year-old woman before (A), immediately after (B), and 1 week after (C), lip augmentation with 1.6-mL HA dermal filler, Juvederm Ultra Plus, in the vermillion border and the body of the lips.

## Duration of Effects and Subsequent Treatments

- Lip augmentation typically lasts 6–9 months after treatment as this is a highly mobile region.
- Subsequent treatment with dermal filler is recommended when the volume of dermal filler product is visibly diminished.

## Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for adequacy of lip augmentation and symmetry. Common issues reported by patients include the following:

- **Bruising, swelling, erythema, and tenderness.** See Follow-ups and Management in the Introduction and Foundation Concepts section. Lip edema typically resolves within 3–5 days. Patients often require reassurance to this effect. Application of ice immediately after the procedure and as directed in the aftercare instructions (Appendix 2) can reduce swelling.
- **Mild lip asymmetry.** Asymmetry may be due to too little or too much filler in lip areas.
  - **Additional filler required.** Identify the areas where more filler is desired, both visually and by palpation. The small region requiring a touch-up can be anesthetized using the lip ring block method, by placing lidocaine intraorally adjacent to the region where the touch up is required. The amount necessary for the touch up will vary based on the volume deficit, and it is typically 0.1–0.3 mL HA-lidocaine.
  - **Too much filler or uneven placement.** Small collections of filler can usually be compressed and smoothed. Large collections may require hyaluronidase injection or, as a last resort, incision and expression of product (see Complications section).

## Complications and Management

- General dermal filler complications and management are reviewed in the Complications section
- Swelling and bruising
- Oral herpes simplex reactivation

**Significant swelling and bruising** are the most common side effects with lip augmentation dermal filler treatments (see Complications section, and Follow-ups and Management in the Introduction and Foundation Concepts section).

**Reactivation of oral herpes simplex** is not uncommon and prophylactic antiviral therapy typically suppresses reactivation (see Preprocedure Checklist in the Introduction and Foundation Concepts section).

## Combining Aesthetic Treatments and Maximizing Results

- **Botulinum toxin.** The orbicularis oris muscle which encircles the mouth, functions to pucker lips and invert the vermillion border, and overtime, this can contribute to reduced lip volume and radial lip line formation. Botulinum toxin treatment of the

orbicularis oris muscle is commonly used adjunctively with dermal fillers for lip augmentation, as it everts the lips slightly and enhances lip fullness.

- **Dermal filler in adjacent areas.** Enhanced lip fullness can be achieved with concurrent dermal filler treatment of the lip border and lip body (see Lip Body chapter).

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$500 to \$800 per syringe of 0.8 mL HA for lip augmentation treatment.

## Lip Body



**FIGURE 1** ● Lip fullness before (A) and 4 weeks after (B) dermal filler treatment of the lip body, using hyaluronic acid.

Using proper technique and products, dermal filler treatments can enhance lip fullness in a natural way. This procedure can benefit patients with diminished lip volume from aging, as well as younger patients for enhancement purposes.

### Indications

- Lip atrophy

### Anatomy

- **Wrinkles, folds, and contours.** The pink area of the lip is called the vermillion, and is composed of dry and wet mucosa. With the mouth closed, the dry mucosa is exposed to the air and the wet mucosa remains inside the mouth. The junction between these two portions of the lip vermillion is called the wet-dry border. Lip shape and fullness varies widely. In general, the lower lip is more full than the upper lip. According to aesthetic norms, the upper lip height in the anterior-posterior view is slightly more than half the size of the lower lip.

## Patient Assessment

- Careful consultation and examination, using a mirror, is necessary to determine lip features that the patient would like enhanced, discuss realistic expectations and advise about aesthetic outcomes. The following points are typically included:
  - A given lip shape can only be enhanced with dermal filler treatment, it cannot be altered into another lip shape.
  - With age, volume loss is more apparent in the upper lip than the lower lip, and some patients may only require treatment of the upper lip.
  - Enhancing the lip body involves placement of dermal filler in the mucosa of the lip.
  - Defining the lip shape and the line around the lips involves dermal filler placement in the vermillion border.
  - Lip augmentation often combines enhancement of both, the lip body and the lip border (see Lip Border chapter).

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.
- **Braces.** Braces on the teeth can distort lip projection and it is best to avoid dermal filler treatment if they are present.

## Treatment Goals

- Natural fuller appearance to the lip without excessive anterior projection or lip eversion. Lip fullness should be congruent with the patient's age.

## Recommended Dermal Filler Product

- Hyaluronic acid (HA) dermal filler products with lidocaine (HA-lidocaine) that have a soft tissue filling effect are recommended for treatment of the lip body, such as Juvederm® Ultra XC or Prevelle® Silk (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section). Other HA-lidocaine products, such as Juvederm® Ultra Plus XC or Restylane-L®, may also be used, and are more suitable for younger patients (ages 20s–30s) who have greater baseline tissue density and lip volume.
- This chapter describes lip body treatment with Juvederm Ultra Plus XC (HA-lidocaine).

## Dermal Filler Treatment Volumes

- The estimated HA dermal filler volume necessary for treatment is based on patients' observed facial anatomy and volume loss in the treatment area.
- Treatment of the body of the upper and lower lips typically requires 0.5–0.8 mL Juvederm Ultra XC, Juvederm Ultra Plus XC, or Restylane-L.

## Equipment for Anesthesia

- Lip ring block supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered or unbuffered (referred to as 2% lidocaine-epinephrine solution)
- 30-gauge, ½-inch needle

## Equipment for Dermal Filler Procedure

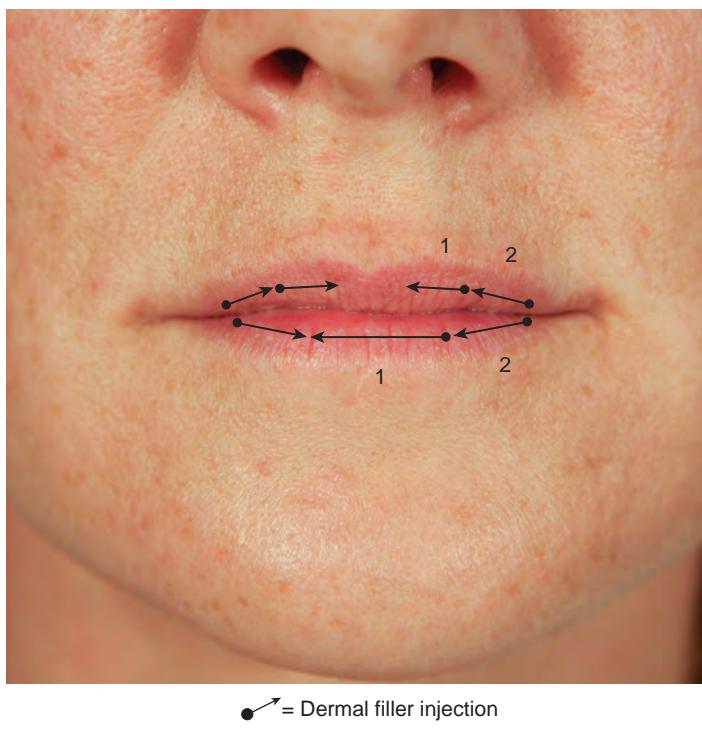
- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Anesthesia Overview

- **Lip ring block.** Adequate anesthesia of the lip prior to dermal filler injection is essential for successful lip body treatments. Patients usually require profound lip anesthesia. Dermal fillers formulated with lidocaine do not offer sufficient pain control for lip filler treatments and a lip ring block is required (see Lip Ring Block in the Anesthesia section).

## Dermal Filler Procedure Overview

- **Overview.** An overview of injection points and injection technique for treatment of the lip body is shown in Figure 2. If treating both the lip border (see Lip Border chapter) and lip body, perform treatment of the lip border first and then treat the lip body. As lip edema can occur rapidly, it is preferable to complete both procedures on one side of lip before proceeding to the opposite side.
- **Number of injections.** There are four linear thread injections for the upper lip body, and three linear thread injections for the lower lip body—a total of seven injections (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section).



**FIGURE 2** ● Overview of lip body dermal filler injections.

- **Depth of injection.** Dermal filler is injected 2–3 mm deep in the mucosa, at or just superior to the wet–dry border, for treatment of the lip body.
- **Cautions**
  - Observe filler volumes closely during treatment and administer equal volumes on both sides of the lips, unless gross asymmetry is present prior to treatment.
  - Lip edema can occur rapidly. At completion of the treatment, the side injected first may appear larger due to edema. If asymmetry is evident at the completion of treatment, and injection volumes and palpable product have been consistent for both sides, then it is advisable to reassess symmetry at the follow-up visit once edema has resolved.
  - Care must be taken to avoid the labial arteries, which are located deep in the labial mucosa, as intravascular dermal filler injection can result in vascular occlusion, tissue ischemia, and necrosis.

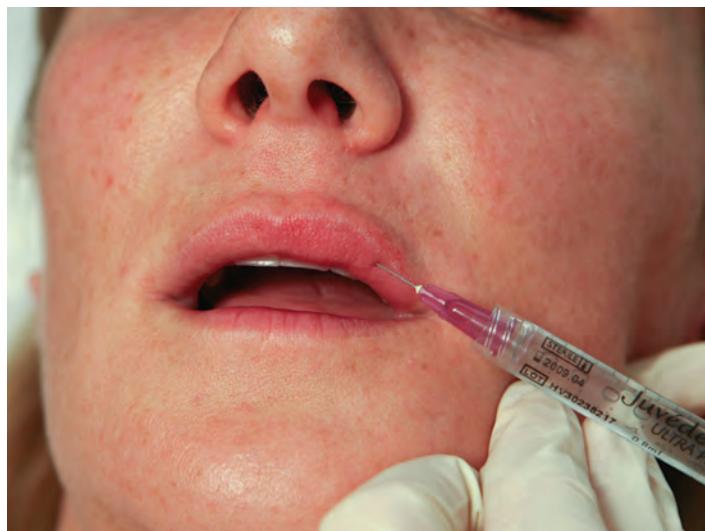
## Performing the Procedure: Dermal Filler Treatment of the Lip Body

### Anesthesia

1. Clean and prepare the lips with alcohol, removing all lipstick if present.
2. Perform a lip ring block (see Lip Ring Block in the Anesthesia section) as follows:
  - For the upper lip, use a total volume of 1.2-mL 2% lidocaine-epinephrine solution.
  - For the lower lip, use a total volume of 1.2-mL 2% lidocaine-epinephrine solution.
  - For the corners of the lips, use a total volume of 0.2-mL 2% lidocaine-epinephrine solution.
3. Wait 3–5 minutes for anesthesia.

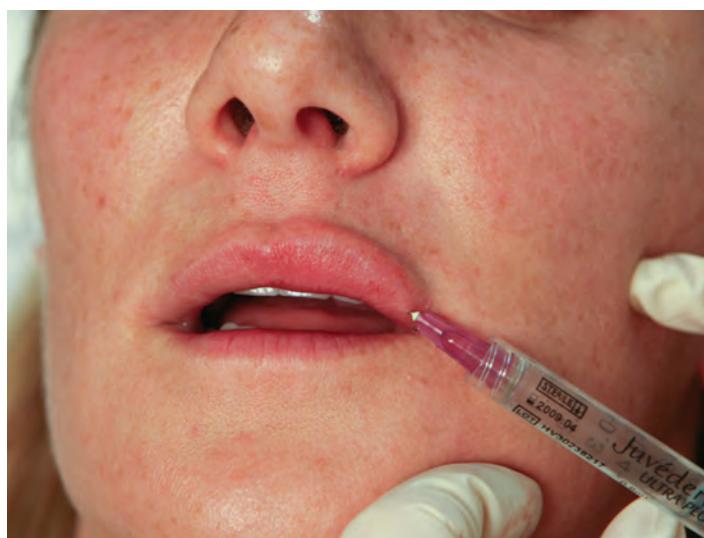
### Dermal Filler Upper Lip Body

1. Position the patient in a 60-degree reclined position.
2. Prepare the lips with alcohol.
3. Attach a 30-gauge,  $\frac{1}{2}$ -inch needle to the prefilled HA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
4. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
5. The provider is positioned on the same side as the lip area to be injected.
6. Identify the first injection point in the body of the upper lip by laying the needle against the mucosa at the wet–dry border, such that the needle tip ends at the ipsilateral peak of the Cupid’s bow. The injection point is at the needle hub.
7. Insert the needle into the lip mucosa at a 30-degree angle to the lip, directing it parallel to the lip body and medially toward the ipsilateral peak of the Cupid’s bow. The needle is inserted to the hub and a linear thread of filler is injected by applying firm and constant pressure on the syringe plunger while gradually withdrawing needle. The filler should flow easily into the lip mucosa and the lip will subtly fill as the product is injected (Fig. 3).
8. The second injection point in the body of the upper lip is one needle length lateral to the first injection point. The needle is inserted to the hub and the filler is smoothly injected as the needle is withdrawn (Fig. 4).



**FIGURE 3** ● First injection for dermal filler treatment of the upper lip body.

9. Gently grasp the lip with thumb on the skin and first finger intraorally, and slowly compress from medial to lateral along the length of the lip to smooth any visible or palpable bumps of filler product. If bumps do not easily compress, the area may be moistened with water and stretched between the provider's fingers. Additional swelling and bruising commonly occur after compression and manipulation of filler product.
10. Reposition to the opposite side of the patient, and repeat the above injections for the contralateral upper lip body.



**FIGURE 4** ● Second injection for dermal filler treatment of the upper lip body.



**FIGURE 5** ● First injection for dermal filler treatment of the lower lip body.

### Dermal Filler Lower Lip Body

1. Repeat steps 1–5 as listed above.
2. Identify the first injection point in the body of the lower lip by laying the needle against the mucosa at the wet–dry border such that the length of the needle spans the center portion of the lower lip. The injection point is at the needle’s hub.
3. Insert the needle into the lip mucosa at a 30-degree angle to the lip, and direct it parallel to the lip and medially across the center portion of the lower lip body. The needle is inserted to the hub and the filler is smoothly injected as the needle is withdrawn (Fig. 5).
4. The second injection point in the body of the lower lip is one needle length lateral to the first injection point. The needle is inserted to the hub and the filler is smoothly injected as the needle is withdrawn (Fig. 6).



**FIGURE 6** ● Second injection for dermal filler treatment of the lower lip body.

5. Reposition to the opposite side of the patient, and repeat the above injections for the contralateral lower lip body.
6. Gently compress the lip from medial to lateral as described above.

### Tip

- Watch for tissue blanching or other ischemic signs or symptoms with injection of the lips. If ischemia occurs, manage as described in Complications, Tissue Ischemia section.

## Results

- Lip augmentation is evident at the time of treatment. Immediately after injection, lips may appear overfilled and project anteriorly due to edema. Once edema resolves, lips will appear more full than at baseline, and will be anatomically positioned (see Lip Border section, Fig. 1A, B and C).

## Duration of Effects and Subsequent Treatments

- Lip augmentation typically lasts 6–9 months after treatment, as this is a highly mobile region.
- Subsequent treatment with dermal filler is recommended when the volume of dermal filler product is visibly diminished.

## Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for adequacy of lip augmentation and symmetry. Common issues reported by patients include the following:

- **Bruising, swelling, erythema, and tenderness.** See Follow-ups and Management in Introduction and Foundation Concepts section. Lip edema typically resolves within 3–5 days. Patients often require reassurance to this effect. Application of ice immediately after the procedure and as directed in the aftercare instructions (Appendix 2) can reduce swelling.
- **Mild lip asymmetry.** Asymmetry may be due to too little or too much filler in some areas.
  - **Additional filler required.** Identify the areas where more filler is desired, both visually and by palpation. The small region requiring a touch up can be anesthetized using the lip ring block method by placing lidocaine intraorally adjacent to the region where the touch up is required. The amount necessary for the touch up will vary based on the volume deficit, and it is typically 0.1–0.3 mL of HA-lidocaine.
- **Too much filler or uneven placement.** Small collections of filler can usually be compressed and smoothed. Large collections may require hyaluronidase injection or, as a last resort, incision and expression of product (see Complications section).

## Complications and Management

- General dermal filler complications and management are reviewed the Complications section
- Swelling and bruising

- Oral herpes simplex reactivation
- Tissue ischemia and necrosis

**Significant swelling and bruising** are the most common side effects with lip augmentation dermal filler treatments (see Complications section, and Follow-ups and Management in the Introduction and Foundation Concepts section).

**Reactivation of oral herpes simplex** is not uncommon and prophylactic antiviral therapy typically suppresses reactivation (see Preprocedure Checklist in the Introduction and Foundation Concepts section).

**Tissue ischemia and necrosis** can result from intravascular dermal filler injection of the labial arteries. With age and associated loss of lip volume, these vessels lie closer to the labial mucosa and the risk of intravascular injection increases (see Complications section).

## Combining Aesthetic Treatments and Maximizing Results

- **Botulinum toxin.** The orbicularis oris muscle which encircles the mouth, functions to pucker lips and invert the vermillion border, and over time, repetitive contraction can contribute to reduced lip volume radial lip line formation. Botulinum toxin treatment of the orbicularis oris muscle is commonly used adjunctively with dermal fillers for lip augmentation, as it everts lips slightly and enhances lip fullness.
- **Dermal filler in adjacent areas.** Enhanced lip fullness can be achieved with concurrent dermal filler treatment of the lip body and lip border (see Lip Border chapter).

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$500 to \$800 per syringe of 0.8 mL HA for lip augmentation treatment.

## Lip Lines



**FIGURE 1** ● Lip lines before (A) and 4 weeks after (B) dermal filler treatment, using calcium hydroxylapatite above the lip and hyaluronic acid in the lip vermillion border.

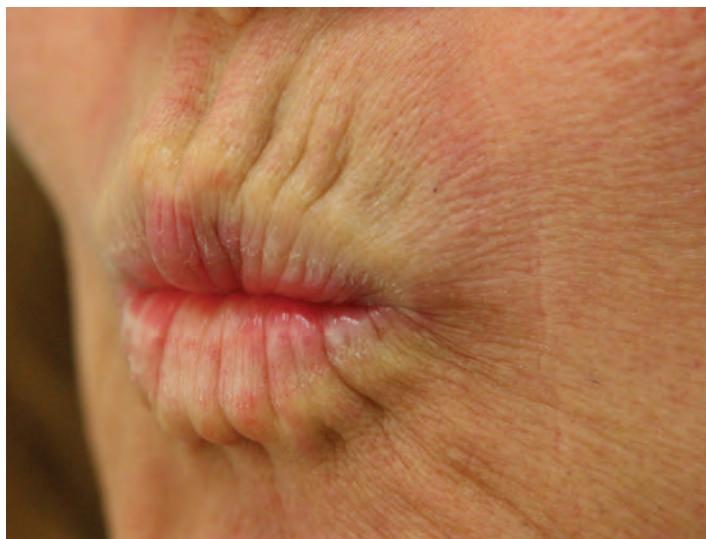
Perioral lip lines, particularly in the upper lip, are commonly seen with aging. Using proper technique and products, dermal filler treatments can reduce perioral lip lines resulting in a smooth natural appearance. Although lip lines can form on both the upper and lower lips, upper lip lines are most problematic for patients, and this chapter, therefore, focuses on treatment of the upper lip region. Two types of filler products are used with the technique described in this chapter. A dermal filler with more structural support is placed above the upper lip, and a more supple dermal filler product is placed in the lip border. These more complex techniques are considered advanced dermal filler procedures.

### Indications

- Perioral rhytids

### Anatomy

- **Wrinkles, folds, and contours.** Lip lines, or perioral rhytids, form perpendicular to the lip and radiate away from the vermillion border (see Dermal Filler Anatomy section, Figs. 1 and 2). Many factors contribute to formation of lip lines including: perioral soft tissue volume loss, lip atrophy, hyperdynamic perioral musculature, and biometric volume loss due to resorption of mandibular bone and tooth alveolar processes.



**FIGURE 2** ● Dynamic lip lines.

## Patient Assessment

- Careful consultation and examination using a mirror is necessary to assess lip and perioral aging changes, discuss realistic expectations and advise about aesthetic outcomes.
- Patients with static lines typically have significant hyperdynamic perioral musculature as well as volume loss (Fig. 2). Optimal reduction of lip lines usually consists of treatment with botulinum toxin and dermal filler (see Combining Aesthetic Treatments and Maximizing Results below).
- Patients with very thin, diminutive upper lips often benefit from dermal filler treatment above the lip only. Treatment of the lip border in these patients can result in an unnatural anterior projection of the upper lip or a “duck” lip.

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.
- **Braces.** Braces on the teeth can distort lip projection and it is best to avoid dermal filler treatment if they are present.

## Treatment Goals

- Natural lip appearance with reduction of lip lines and defined lip border without excessive anterior projection or lip eversion.

## Recommended Dermal Filler Product

- The region above the upper lip is ideally treated with dermal filler products that offer significant structural support such as Radiesse®, which is a calcium hydroxylapatite (CaHA) product. Products that provide moderate structural support, such as Juvederm® Ultra Plus and Restylane®, which are hyaluronic acid (HA) products, can also be used (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section).

- Filling the lip border can be achieved using a dermal filler product that has a softer tissue fill such as Juvederm® Ultra XC or Prevelle® Silk (hyaluronic acid-lidocaine). Patients requiring treatment of lip lines typically have lip atrophy and the firmer HA products are less appropriate (see Products and Basic and Advanced Procedures in the Introduction and Foundation Concepts section).
- This chapter describes treatment of upper lip lines with the following products:
  - **Above the upper lip** is treated with Radiesse (CaHA), in particular CaHA that has been mixed with a small amount of lidocaine (CaHA-lidocaine)
  - **Upper lip border** is treated with Juvederm Ultra XC (HA-lidocaine).

## Dermal Filler Treatment Volumes

- The estimated dermal filler volume necessary for treatment is based on patients' observed facial anatomy and volume loss in the treatment area.
- Treatment above the upper lip typically requires 0.3–0.4 mL CaHA-lidocaine (Radiesse®).
- Treatment of the medial vermillion border of the upper lip typically requires 0.3–0.4 mL HA-lidocaine (Juvederm® Ultra XC).

## Equipment for Anesthesia

- Lip Ring Block supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered or unbuffered (referred to as 2% lidocaine-epinephrine solution)
- 30-gauge, ½-inch needle

## Equipment for Dermal Filler Procedure

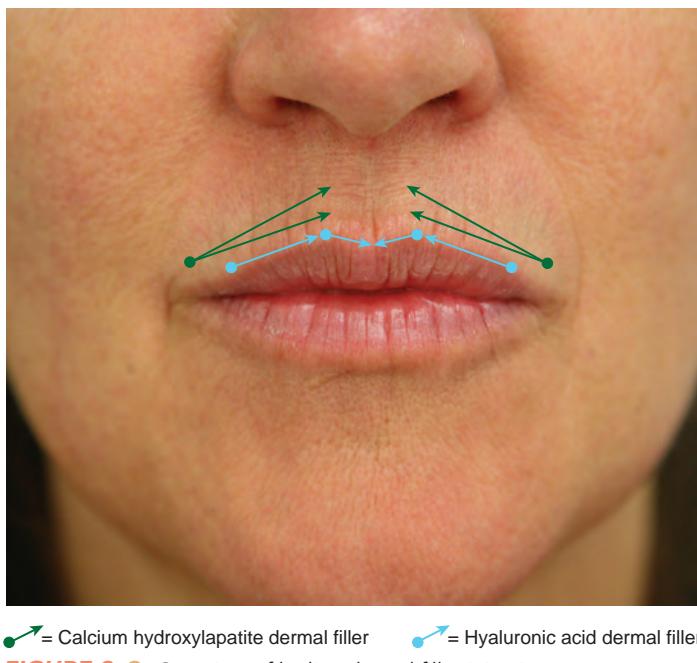
- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- CaHA mixing supplies (see Equipment in the Introduction and Foundation Concepts section)
- 27-gauge, 1½-inch needle
- 30-gauge, ½-inch needle

## Anesthesia Overview

- **Lip ring block.** Adequate anesthesia of the lip prior to dermal filler injection is essential for successful lip line treatments. Patients usually require profound lip anesthesia. Dermal fillers formulated or mixed with lidocaine do not offer sufficient pain control for lip filler treatments and a lip ring block is required (see Lip Ring Block in the Anesthesia section).

## Dermal Filler Procedure Overview

- **Overview.** An overview of injection points and injection technique for treatment of upper lip lines is shown in Figure 3. Treatment of lip lines is achieved with dermal filler injection above the upper lip and into the lip vermillion border. This method reduces the appearance of lip lines by volumizing the upper lip area.
- **CaHA-lidocaine preparation** is performed at the time of treatment (see Calcium Hydroxylapatite and Lidocaine Preparation in the in Introduction and Foundation Concepts section)



● = Calcium hydroxylapatite dermal filler      ● = Hyaluronic acid dermal filler

**FIGURE 3** ● Overview of lip line dermal filler injections.

- **Number of injections and injection depth.**
  - **Above the upper lip** is treated with two fanning injections using CaHA-lidocaine. Injections are placed in the mid- to deep dermis.
  - **The vermillion border** is treated with four linear thread injections using HA-lidocaine (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section). Injections are placed in the superficial dermis of the vermillion border.
- **Cautions**
  - Observe filler volumes closely during treatment and administer equal volumes on both sides of the lips, unless gross asymmetry is present prior to treating.
  - Care should be taken to avoid injection into the vermillion border or the lip mucosa with CaHA, as there are reports of nodules with Radiesse injected in the lip.
  - Perioral and lip edema can occur rapidly. If significant edema is evident after placing CaHA-lidocaine above the upper lip, discontinue further treatment and assess lip lines at the follow-up visit in 2–4 weeks. In addition, the side injected first may appear larger at the completion of treatment due to edema. If asymmetry is evident at the completion of treatment, and injections volumes and palpable product have been consistent for both sides, then it is advisable to reassess symmetry at the follow-up visit once edema has resolved.

## Performing the Procedure: Dermal Filler Treatment of Lip Lines

### Anesthesia

1. Clean and prepare the lips with alcohol, removing all lipstick if present.
2. Perform a lip ring block (see Lip Ring Block in the Anesthesia section) as follows:

- For the upper lip, use a total volume of 1.2-mL 2% lidocaine-epinephrine solution.
  - For the lower lip, use a total volume of 1.2-mL 2% lidocaine-epinephrine solution.
  - For the corners of the lips, use a total volume of 0.2-mL 2% lidocaine-epinephrine solution.
3. Wait 3–5 minutes for anesthesia.

### Dermal Filler Above the Upper Lip

1. Position the patient in a 60-degree reclined position.
2. Prepare the lips with alcohol.
3. The provider is positioned on the same side as the lip to be injected.
4. Use a prepared CaHA-lidocaine dermal filler syringe and attach a 27-gauge, 1½-inch needle to the syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. Identify the first injection point above the lip by laying the needle 3–4 mm superior and parallel to the vermillion border, such that the needle tip ends at the ipsilateral peak of the Cupid's bow. The first injection point is at the needle hub (Fig. 4A).
7. Insert the needle at a 30-degree angle to the skin and direct it medially toward the peak of the ipsilateral Cupid's bow and parallel to the lip (Fig. 4B). Apply firm and constant pressure on the syringe plunger while gradually withdrawing needle to inject a linear thread of filler in the mid- to deep dermis. Fan the needle superiorly without fully withdrawing the needle from the skin to inject another linear thread, using small angulations to ensure that dermal filler placement is contiguous.
8. Gently grasp the lip with the thumb on the skin and first finger intraorally, and slowly compress from medial to lateral along the length of the lip, to smooth any visible or palpable bumps of filler product. If bumps do not easily compress, the area may be moistened with water and stretched between the provider's fingers. Additional swelling and bruising commonly occur after compression and manipulation of filler product in the lip area.
9. Reposition to the opposite side and repeat the above injections for contralateral area above the upper lip.

### Dermal Filler Lip Border

1. The provider is positioned on the same side to be injected.
2. Use a prefilled HA-lidocaine syringe and attach a 30-gauge, ½-inch needle.
3. Identify the first lip border injection point by laying the needle against the vermillion border such that the needle tip ends at the ipsilateral peak of the Cupid's bow. The needle insertion point is at the needle hub. Insert the needle into the vermillion border at a 30-degree angle to the lip and direct it toward the ipsilateral peak of the Cupid's bow (Fig. 5). Apply firm and constant pressure on the syringe plunger while gradually withdrawing needle to inject a linear thread of filler. The filler should flow easily into the vermillion border and a rolled border to the lip will be visible as the filler product is injected. Figure 6 shows the left vermillion border immediately after treatment.
4. The second lip border injection point is at the ipsilateral peak of the Cupid's bow. Insert the needle and advance inferior-medially to the nadir of the Cupid's bow. Smoothly inject a small amount of filler as the needle is withdrawn.



**FIGURE 4** ● Injection above the upper lip for dermal filler treatment of lip lines: needle insertion point determination (**A**) and injection technique (**B**).

5. Gently grasp the lip with thumb on the skin and first finger intraorally, and slowly compress from medial to lateral along the length of the lip to smooth any visible or palpable bumps of filler product. If bumps do not easily compress, the area may be moistened with water and stretched between the provider's fingers. Additional swelling and bruising commonly occur after compression and manipulation of filler product.
6. Reposition to the opposite side and repeat the above injections for the contralateral upper lip border.

### Tips

- Filler should be smooth and confluent in the vermillion border. If there is a visible or palpable skipped area, inject this area using the earlier technique until filler product is contiguous and desired correction is achieved.



**FIGURE 5** ● Injection in the lip border for dermal filler treatment of lip lines.

## Results

- Reduction of lip lines is evident at the time of treatment. However, immediately after injection, the upper lip may appear overfilled and project anteriorly due to edema. Once edema resolves, lips will appear more defined with reduced radial lip lines. Figure 1 shows a 46-year-old woman with lip lines before (A) and 4 weeks after (B) treatment with 0.3 mL CaHA-lidocaine (Radiesse) above the upper lip and 0.3 mL HA-lidocaine (Juvederm Ultra XC) in the vermillion border of the upper lip.



**FIGURE 6** ● Left upper lip border immediately after dermal filler treatment with hyaluronic acid.

## Duration of Effects and Subsequent Treatments

- Reduction of lip lines with dermal filler typically lasts 9–12 months after treatment, as this is a highly mobile region.
- Subsequent treatment with dermal filler is recommended when the volume of dermal filler product is visibly diminished, prior to their pretreatment appearance.

## Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for adequacy of lip augmentation and symmetry. Common issues reported by patients include the following:

- **Bruising, swelling, erythema, and tenderness.** See Follow-ups and Management in the Introduction and Foundation Concepts section. Lip edema typically resolves within 3–5 days. Patients often require reassurance to this effect. Application of ice immediately after the procedure and as directed in the aftercare instructions (Appendix 2) can reduce swelling.
- **Mild lip asymmetry.** Asymmetry may be due to too little or too much filler in some areas.
  - **Additional filler required.** Identify the areas where more filler is desired, both visually and by palpation. The small region requiring a touch-up can be anesthetized using the lip ring block method by placing lidocaine intraorally adjacent to the region where the touch-up is required. The amount necessary for the touch-up will vary based on the volume deficit, and it is typically 0.1–0.2 mL CaHA-lidocaine or 0.1–0.2 mL HA-lidocaine.
  - **Too much filler or uneven placement.** Small collections of filler can usually be compressed and smoothed. Large collections of HA may require hyaluronidase injection, or as a last resort, HA and CaHA collections may be incised and product expressed (see Complications section).

## Complications and Management

- General dermal filler complications and management are reviewed in the Complications section
- Swelling and bruising
- Oral herpes simplex reactivation

**Significant swelling and bruising** are the most common side effects with lip augmentation dermal filler treatments (see Complications section, and Follow-ups and Management in the Introduction and Foundation Concepts section).

**Reactivation of oral herpes simplex** is not uncommon and prophylactic antiviral therapy typically suppresses reactivation (see Preprocedure Checklist in the Introduction and Foundation Concepts section).

## Combining Aesthetic Treatments and Maximizing Results

- **Botulinum toxin.** The orbicularis oris muscle, which encircles the mouth functions to pucker lips, can contribute to lip line formation. Botulinum toxin treatment of the orbicularis oris muscle is commonly performed adjunctively to reduce lip lines and enhance lip fullness as it everts lips slightly.

- **Skin resurfacing and collagen stimulating treatments.** Reduction of lip lines can often be improved by combining dermal fillers with skin resurfacing or collagen stimulating procedures such as ablative and nonablative lasers, dermabrasion, and chemical peels. With the more aggressive procedures such as ablative and fractional ablative lasers, dermabrasion, and medium depth chemical peels, dermal filler treatments are performed after recovery. With less aggressive procedures such as nonablative lasers, superficial chemical peels, and microdermabrasion, dermal filler treatments may be performed in the same visit or prior to these procedures.

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$500 to \$800 per syringe of 0.8 mL HA and \$650 to \$850 per syringe of 0.8 mL CaHA for lip line treatment.



## Malar Augmentation



A



B

**FIGURE 1** ● Malar region before (A) and 4 weeks after (B) dermal filler malar augmentation, using calcium hydroxylapatite.

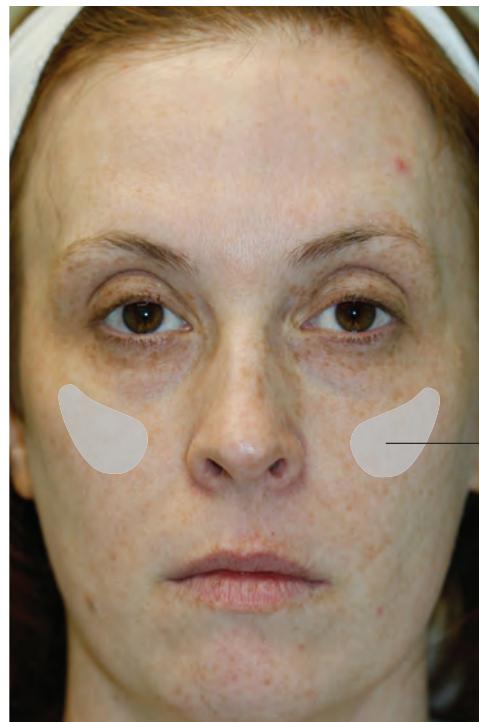
A flat malar area can make the face appear tired and sunken, and contribute to a prematurely aged appearance. Treatment of a flat malar area has traditionally been a surgical procedure utilizing malar implants. Dermal fillers can also be used to successfully restore midface fullness and enhance malar contours. Malar augmentation utilizes dermal filler products that offer more structural support, and is considered an advanced dermal filler procedure.

### Indications

- Malar atrophy and flattening

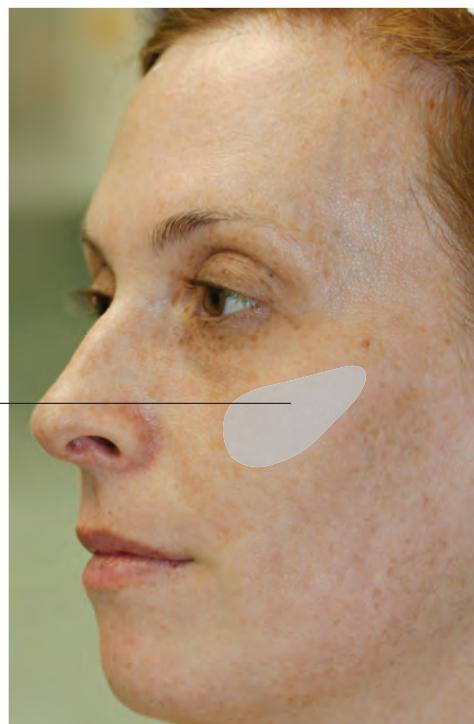
### Anatomy

- **Wrinkles, folds, and contour changes.** Over time, the convex contour of the midface region can flatten or become concave (see Dermal Filler Anatomy section, Figs. 1 and 2). Descent of the malar soft tissue complex from the zygoma and orbital rims inferomedially, and malar fat pad atrophy contribute to these contour changes. The malar groove (Figs. 3A and 3B), also called the zygomatic hollow, is a linear depression that runs diagonally across the zygoma, parallel to the nasolabial fold. It corresponds to a deep ligament attachment (zygomaticomalar ligament) and can become more apparent over time with midface tissue atrophy



A

Malar treatment area



B

**FIGURE 2** Malar augmentation treatment area from the front (**A**) and lateral (**B**) views.



- |                           |                          |
|---------------------------|--------------------------|
| 1. Superior zygoma margin | 4. Malar groove          |
| 2. Orbital rim            | 5. First injection point |
| 3. Inferior zygoma margin | 6. Nasolabial fold       |

**FIGURE 3** ● Facial landmarks for dermal filler malar augmentation from the front (**A**) and lateral (**B**) views.

and descent. The infraorbital vein, artery, and nerve are located along the midpupillary line approximately 2.5 cm below the inferior orbital rim (see Dermal Filler Anatomy section, Figs. 3 and 4).

## Patient Assessment

- Malar contour is assessed from the anterior (Fig. 2A) and 45-degree views (Fig. 2B). A desirable malar contour is convex and not flat.

## Contraindications

- See Contraindications in Introduction and Foundation Concepts section.

## Treatment Goals

- Increased anterior projection and convexity of the malar region.

## Recommended Dermal Filler Product

- This is an area of deep volume loss and is ideally treated with advanced dermal filler products that offer more structural support such as Radiesse® (calcium hydroxylapatite [CaHA]) or Perlane-L® (hyaluronic acid [HA]) (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section).



● = 0.1 mL Lidocaine

**FIGURE 4** ● Anesthesia for malar augmentation dermal filler treatment.

- This chapter describes malar augmentation with CaHA (Radiesse), in particular CaHA that has been mixed with a small amount of lidocaine (CaHA-lidocaine). CaHA-lidocaine has reduced viscosity and a mild anesthetic effect (see Calcium Hydroxylapatite and Lidocaine Preparation in the Introduction and Foundation Concepts section).

## Dermal Filler Treatment Volumes

- The estimated CaHA-lidocaine (Radiesse) dermal filler volume necessary for treatment is based on the patient's observed facial anatomy and volume loss in the treatment area.
- Malar augmentation typically requires 2.0–2.6 mL CaHA-lidocaine.

## Equipment for Anesthesia

- Local infiltration injection supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered (referred to as buffered 2% lidocaine-epinephrine solution)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Equipment for Dermal Filler Procedure

- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- CaHA (Radiesse) with lidocaine mixing supplies (see Equipment in the Introduction and Foundation Concepts section)
- 28-gauge,  $\frac{3}{4}$ -inch needle

## Landmarks

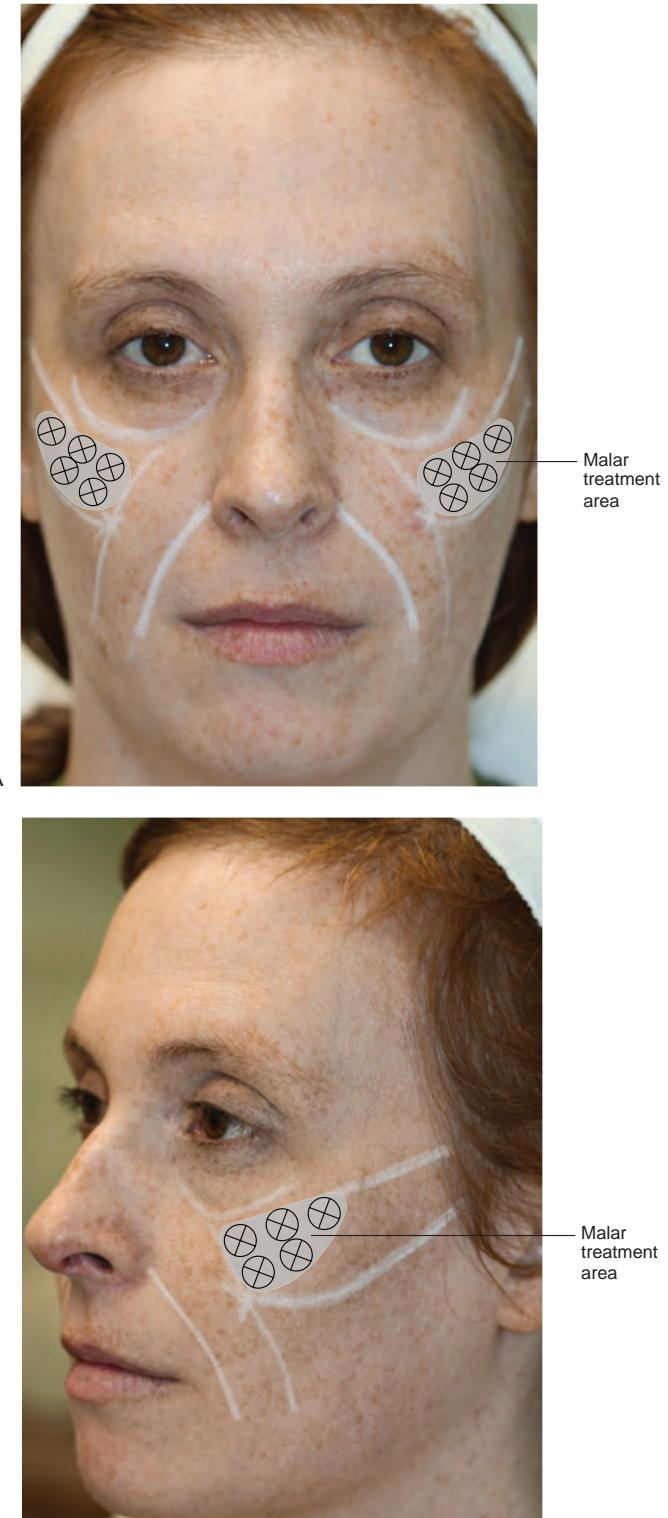
Facial landmarks are marked on the patient at rest using a soft white eyeliner pencil including the nasolabial folds, malar grooves which run parallel to the nasolabial folds, inferior orbital rims, and margins of the zygoma (Figs. 3A and 3B). Note that the zygoma is oriented horizontally in the midface and angulates superior laterally towards the ear. All injections are placed along the zygoma bone. Palpate the inferior margin zygoma in the midface and follow it superolaterally to create a mental map of the bone.

## Anesthesia Overview

- **Local lidocaine infiltration.** Buffered 2% lidocaine-epinephrine solution can be used to achieve anesthesia for malar augmentation. The malar area is anesthetized using six injections of 0.1 mL for a total volume of 0.6 mL (Fig. 4). See Injectable Anesthetics in the Anesthesia section for additional information on local infiltration methods.

## Overview of Dermal Filler Procedure

- **Overview.** Malar augmentation targets the flattened cheek area and malar groove (Figs. 2A and 2B). An overview of malar augmentation injection points and injection technique is shown in Figures 5A and B.
- **Number of injections.** There are five depot injections on each side of the face (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section). The five injections are distributed in two rows that form a roughly triangular region, with the base located approximately 2 cm lateral to the nasolabial fold, and the tip superolateral along the zygoma.
- **Injection depth and volume.** Dermal filler is placed in the supraperiosteal plane for malar augmentation using the depot injection technique. The needle is inserted through the skin and muscle, and advanced until a gentle tap is felt against the bone. The needle is then withdrawn 1–2 mm, and a bolus of product is placed just above the bone. The volume placed at each injection point is determined by the depth of the



B

⊕ = Suprperiosteal dermal filler bolus

**FIGURE 5** Overview of dermal filler injections for malar augmentation seen from the front (**A**) and lateral (**B**) views.

28-gauge,  $\frac{3}{4}$ -inch needle in tissue. Deeper injection points receive greater volumes. The medial injection points are usually deeper than the lateral sites.

- **Cautions**

- The region between the ala and nasolabial fold is avoided with malar augmentation, as dermal filler in this area can accentuate the nasolabial fold.
- The infraorbital vein, artery, and nerve are avoided with malar augmentation.

## Performing the Procedure: Dermal Filler Malar Augmentation

### Anesthesia

1. Clean and prepare the skin in the extended mental crease area with alcohol.
2. Inject buffered 2% lidocaine-epinephrine solution subcutaneously as shown in Figure 4.
3. Allow a few minutes for anesthesia.

### Dermal Filler

1. Position the patient in a 45-degree reclined position.
2. Clean and prepare the skin of the malar region with alcohol.
3. The provider is positioned on the same side as the malar area to be injected.
4. Attach a 28-gauge,  $\frac{3}{4}$ -inch needle to the CaHA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. The first injection point is at the intersection of the malar groove line and the inferior margin of the zygoma. Insert the needle at 45 degrees to the skin and direct it posteriorly toward the zygoma bone. Advance to the needle until bone is felt as a soft tap. Withdraw the needle 1–2 mm and, using the depot technique, inject with firm and constant pressure on the syringe plunger (Fig. 6). If the needle is inserted to:
  - Full depth, inject 0.2–0.3 mL CaHA-lidocaine
  - Half depth or less, inject 0.1 mL CaHA-lidocaine.

After depositing the desired volume of product, discontinue injection and then remove the needle.

7. The second injection point is approximately 1 cm superolateral to the first, along the inferior zygoma. Inject as described above.
8. The third injection point, which is the last injection in this row, is approximately 1 cm superolateral to the second, along the inferior zygoma. Inject as above.
9. The fourth injection point begins the superior row of injections and is approximately 1 cm superior and slightly medial to the first injection point. Inject as above.
10. The fifth injection point is approximately 1 cm superolateral to the fourth injection point. Inject as above.
11. Palpate the treatment area to determine whether there are any skipped areas where filler is not palpable. Inject these areas with small boluses, using the above technique, until filler product placement is contiguous and desired correction is achieved.



**FIGURE 6** ● Depot injection technique for malar augmentation dermal filler treatment.

12. Compress the treatment area with both thumbs on the skin using firm pressure from medial to lateral, to ensure a smooth contour to the cheek.
13. Reposition to the opposite side of the patient and repeat the above injections for the contralateral malar region.

### Tip

- Take care not to inject filler product while the needle is withdrawn as this may track product in the dermis. If the product is tracked in the dermis, squeeze the skin and express the product from the insertion site.

### Results

- Malar augmentation is immediately evident at the time of treatment. Malar augmentation results are shown in Figure 1 for a 36-year-old patient before (A) and 4 weeks after (C) treatment with 2.0-mL CaHA-lidocaine dermal filler, Radiesse.

### Duration of Effects and Subsequent Treatments

- Malar augmentation with CaHA typically lasts 1–1½ years.
- Subsequent treatment with dermal filler is recommended when the volume of filler product is visibly diminished and the malar contour begins to flatten, or the malar groove is more obvious, prior to the pretreatment appearance.

## Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for adequacy of malar augmentation. Common issues reported by patients include the following:

- **Bruising, swelling, erythema, and tenderness.** See Follow-up section in the Introduction and Foundation Concepts section for recommendations and management strategies.
- **Asymmetry.** Additional dermal filler may be necessary if a volume deficit is visible. A typical touch-up procedure requires 0.3–0.4 mL CaHA-lidocaine to address volume deficits. If possible, use ice or topical anesthetic for the touch-up procedure to reduce tissue distortion that can occur with local lidocaine infiltration.

## Complications and Management

- General dermal filler complications and management are reviewed the Complications section.

## Combining Aesthetic Treatments and Maximizing Results

- **Dermal filler in adjacent areas.** Patients requiring malar augmentation may also have prominent nasolabial folds. It is advisable to perform malar augmentation first and reassess nasolabial folds at the follow-up visit. Restoring midface volume can reduce nasolabial folds and hence, smaller treatment volumes for nasolabial fold correction can often be used after malar augmentation is performed (see Nasolabial Fold chapter).

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, the injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$650 to \$1200 per syringe of 1.5 mL CaHA for malar augmentation.



## Frown Lines



**FIGURE 1** ● Frown lines before (**A**) and 2 weeks after (**B**) dermal filler treatment using hyaluronic acid.

Frown lines convey irritation, anger, and frustration and are a common presenting complaint of patients seeking aesthetic treatments. Botulinum toxin is the treatment of choice for frown lines resulting from hyperdynamic musculature. However, static frown lines that are etched into the skin and visible at rest, respond well to dermal filler treatments.

### Indications

- Static frown lines

### Anatomy

- **Wrinkles, folds, and contours.** Frown lines, or glabellar rhytids, are vertical lines between the medial eyebrows (see Dermal Filler Anatomy section, Figs. 1 and 2). Lines and wrinkles seen only during active facial expression such as frowning, laughing, or smiling, are referred to as dynamic lines (Fig. 2A). Over time, dynamic lines can become permanently etched into skin, resulting in lines that are present at rest, which are referred to as static lines (Fig. 3B).

### Patient Assessment

- Frown lines are assessed with contraction of frown muscles and at rest to determine the dynamic and static components. Patients with predominantly dynamic frown lines



**FIGURE 2** ● Younger patient demonstrating dynamic frown lines seen with glabellar complex muscle contraction (**A**) and lack of static lines at rest (**B**) who is a poor candidate for dermal filler treatment of frown lines.

are more appropriate candidates for botulinum toxin treatment (Fig. 2). Patients with static lines usually have significant hyperdynamic musculature as well as volume loss (Fig. 3), and optimal results can be achieved with combination therapy using botulinum toxin and dermal filler (see Combining Aesthetic Treatments and Maximizing Results later).

## Contraindications

- See Contraindications in Introduction and Foundation Concepts section.

## Treatment Goals

- Reduction of static frown lines with full effacement.

## Recommended Dermal Filler Product

- Because of the risk of developing ischemia and vascular occlusion in the glabella, frown lines are best treated with the thinnest dermal fillers such as Juvederm® Ultra XC or Prevelle® Silk (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section). Juvederm Ultra XC (hyaluronic acid) has a greater



**FIGURE 3** Mother of patient in Figure 2 demonstrating dynamic frown lines seen with glabellar complex muscle contraction (**A**), and prominent static lines at rest (**B**) who is a good candidate for dermal filler treatment of frown lines.

longevity and is currently the preferred product by the author for the treatment of frown lines.

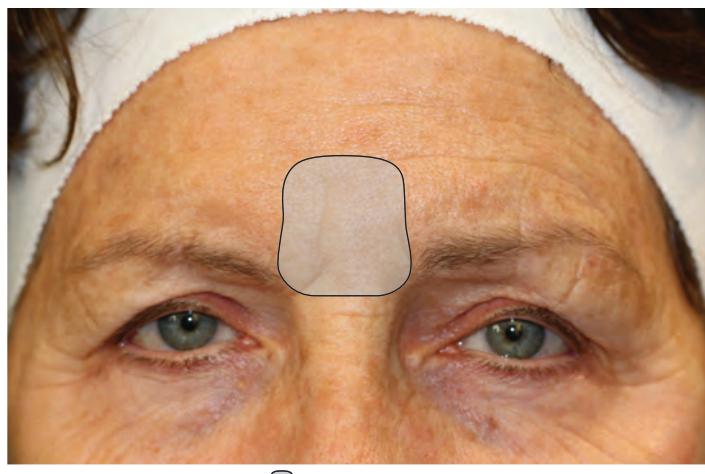
- This chapter describes treatment of static frown lines with Juvederm Ultra XC (HA-lidocaine).

## Dermal Filler Treatment Volumes

- The estimated HA-lidocaine dermal filler volume necessary for treatment is based on patient's observed facial anatomy and volume loss in the treatment area. Small volumes are typically required for treatment of frown lines, which range from 0.2 to 0.3 mL HA-lidocaine.

## Equipment for Anesthesia

- General topical anesthetic supplies (see Equipment for Topical Anesthetics in the Anesthesia section)
- Benzocaine:lidocaine:tetracaine (BLT) ointment



□ = Topical anesthetic

**FIGURE 4** ● Anesthesia for frown line dermal filler treatment.

## Equipment for Dermal Filler Procedure

- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- 30-gauge,  $\frac{1}{2}$ -inch needle

## Anesthesia Overview

- **Topical anesthetic.** BLT may be used to achieve anesthesia in the frown area (see Topical Anesthetics in the Anesthesia section) as shown in Figure 4.
- **Ice.** Ice is commonly used as an alternative to BLT in the frown line area.

## Dermal Filler Procedure Overview

- **Overview.** An overview of injection points and injection technique for treatment of frown lines, using a HA dermal filler, is shown in Figure 5.
- **Number of injections.** Injections are placed using the linear thread technique (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section). For each frown line, start with one injection at the superior most portion. If the frown line is longer than the needle length, proceed inferiorly with one additional injections. The number of injections varies according to the length of the individual patient's frown lines.
- **Injection depth.** Dermal filler is injected in the mid-dermis for treatment of frown lines.
- **Cautions.** The glabellar region is a higher risk area for ischemia and necrosis due to overfilling of tissue or vascular occlusion. Using thin dermal filler products, intradermal placement, low filler volumes, gentle plunger pressure, and keeping the needle slowly moving at all times in a retrograde fashion while injecting, may reduce the likelihood of vascular compromise in the glabellar region.



**FIGURE 5** Overview of frown line dermal filler injections.

## Performing the Procedure: Dermal Filler Treatment of Frown Lines

### Anesthesia

1. Clean and prepare the skin of the frown line area with alcohol.
2. Apply 0.5 g BLT as a thin layer to the frown area, using a cotton-tipped applicator or gloved finger (Fig. 4). Gently rub BLT, using small circular motions, to enhance penetration into the skin. Occlusion with plastic wrap is not necessary.
3. Remove BLT, 15–30 minutes after application using alcohol.

### Dermal Filler

1. Position the patient in a 45-degree reclined position.
2. Prepare the frown lines with alcohol.
3. The provider is positioned on the opposite side of the frown line to be treated, standing behind the head of the bed.
4. Attach a 30-gauge,  $\frac{1}{2}$ -inch needle to the prefilled HA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. The first injection is started at the superior most portion of the frown line. Insert the needle at a 30-degree angle to the skin, direct it inferiorly, and advance to the needle hub. Apply gentle, constant pressure on the syringe plunger while gradually withdrawing needle to inject a linear thread of filler in the mid-dermis (Fig. 6).
7. If a second injection is required, the injection point is approximately one-needle length inferior to the first injection point and placed as above. Frown lines typically angle laterally, and the path of injection should follow the patient's specific frown line anatomy.



**FIGURE 6** ● Injection technique for dermal filler treatment of frown lines.

8. Compress the edges of the product placing both thumbs on either side of the frown line to mold the filler into the frown line.
9. Reposition and repeat the above injections for contralateral side of face.

### Tip

- Watch for tissue blanching and other ischemic signs or symptoms in the frown line area. If ischemia occurs, manage as described in Tissue Ischemia in the Complications section.

### Results

- Reduction of frown lines is immediately evident at the time of treatment. Figure 1 shows a 60-year-old woman with static frown lines before (A) and 2 weeks after (B) treatment with 0.3 mL HA-lidocaine dermal filler, Juvederm Ultra XC.

### Duration of Effects and Subsequent Treatments

- Visible correction of frown lines typically lasts 9 months to 1 year after treatment.
- Subsequent treatment with dermal filler is recommended when the volume of dermal filler product is visibly diminished and the frown lines become more prominent again prior to their pretreatment appearance.

### Follow-ups and Management

Patients are assessed 4 weeks after treatment to evaluate for reduction of frown lines. Common issues reported by patients include the following:

- **Bruising, swelling, erythema, and tenderness.** See Follow-ups and Management in the Introduction and Foundation Concepts section.
- **Persistent frown lines.** Persistent lines may be due to the following:
  - **Volume deficit.** Additional dermal filler may be necessary if a volume deficit persists. Typically, small volumes of 0.1–0.2 mL HA-lidocaine will achieve the desired result.

- **Dynamic frown lines.** Combination treatment with botulinum toxin may be required to achieve optimal reduction of frown lines with hyperdynamic musculature (see Combining Aesthetic Treatments later).
- **Superficial static lines.** These will typically soften over the subsequent months after patients have received botulinum toxin and dermal filler treatments. Resurfacing and collagen-stimulating procedures can further reduce static lines (see Combining Aesthetic Treatments later).

## Complications and Management

- General dermal filler complications and management are reviewed in the Complications section
- Tissue ischemia and necrosis
- Blindness

**Ischemia** and subsequent **tissue necrosis** in the frown line area can be due to either overfilling the tissue or vascular occlusion. It can present with or without pain and is usually visible as immediate blanching. Ischemia is managed urgently, as it can rapidly progress to tissue necrosis (see Complications section for management). **Blindness** due to retinal artery embolization following dermal filler treatment in the glabella has been reported.

## Combining Aesthetic Treatments and Maximizing Results

- **Botulinum toxin.** Combining dermal filler treatment of frown lines with botulinum toxin treatment of the glabellar complex muscles can improve reduction of frown lines. Botulinum toxin treatment of the glabellar complex is ideally performed 2 weeks prior to dermal filler treatment to relax hyperdynamic musculature; however, it may also be performed at the time of treatment, or after treatment once bruising and swelling resolve. In addition to softening static frown lines, reducing glabellar muscle contraction helps ensure the smoothest possible dermal filler results.
- **Skin resurfacing and collagen-stimulating treatments.** Reduction of superficial static frown lines can be improved by combining dermal fillers with skin resurfacing and collagen-stimulating procedures such as ablative and nonablative lasers, dermabrasion, and chemical peels. With the more aggressive procedures such as ablative and fractional ablative lasers, dermabrasion, and medium depth chemical peels, dermal filler treatments are performed after recovery. With less aggressive procedures such as nonablative lasers, superficial chemical peels, and microdermabrasion, dermal filler treatments may be performed during the same visit or prior to these procedures.

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, the injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$500 to 800 per syringe of 0.8 mL HA used for treatment of frown lines.



# Scars



**FIGURE 1** ● Scars before (**A**) and 4 weeks after (**B**) dermal filler treatment, using hyaluronic acid.

Atrophic depression scars on the face are common sequelae from skin excisions, acne, chickenpox and trauma. Soft, distensible scars can be effectively smoothed with dermal filler treatments.

## Indications

- Depression scars

## Anatomy

- **Wrinkles, folds, and contours.** Atrophic scars, or depression scars, typically present as either smooth scars with soft, rounded borders or deep, narrow ice pick scars. Histologically these scars are composed of fibrotic tissue, which can be tethered to the subcutaneous tissue.

## Patient Assessment

- Patient history is reviewed regarding the cause of scarring including acne, surgery, trauma, and infection. Discussion of expectations regarding the temporary nature of scar improvement with dermal filler treatments is important to ensure patient satisfaction.

- Scars are examined and the skin gently pulled, or distended, on either side using the first finger and thumb. Most atrophic scars with soft, rounded borders that are distensible can be improved with dermal fillers.

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.
- Ice pick scars
- Nondistensible scars

## Treatment Goals

- Full effacement of depression scars without overfilling.

## Recommended Dermal Filler Product

- Basic hyaluronic acid (HA) dermal filler products lidocaine (HA-lidocaine) that have supple, soft tissue filling effects such as Juvederm® Ultra XC are recommended for treatment of depression scars. Other HA-lidocaine products may also be used such as Prevelle® Silk, however, this has a shorter duration of action (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section).
- This chapter describes treatment of depression scars with Juvederm Ultra XC (HA-lidocaine).

## Dermal Filler Treatment Volumes

- The estimated HA dermal filler volume necessary for treatment is based on the extensiveness and depth of facial scarring. Small volumes are typically required for treatment of all facial scarring, which range from 0.3 to 0.4 mL HA-lidocaine.

## Equipment for Anesthesia

- General topical anesthetic supplies (see Equipment for Topical Anesthetics in the Anesthesia section)
- Benzocaine:lidocaine:tetracaine (BLT) ointment

## Equipment for Dermal Filler Procedure

- General dermal filler injection supplies (see Equipment for Topical Anesthetics in the Anesthesia section)
- 30-gauge,  $\frac{1}{2}$ -inch needle
- Small wooden cotton-tipped applicators

## Anesthesia Overview

- **Topical anesthetic.** BLT may be used to achieve anesthesia for scars (see Topical Anesthetics in the Anesthesia section) as shown in Figure 2. HA dermal fillers formulated with lidocaine have improved patient tolerance relative to non-lidocaine



○ = Topical anesthetic

**FIGURE 2** ● Anesthesia for scar dermal filler treatment.

products and adequate anesthesia for scars can typically be obtained using a topical anesthetic.

- **Ice.** Ice is commonly used as an alternative to BLT in the scar area.

## Dermal Filler Procedure Overview

- **Overview.** An overview of injection points and injection technique for treatment of scars using a HA dermal filler is shown in Figure 3.
- **Number of injections.** Typically two to four fanning injections are performed based on the size of the scar (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section). Injection points are just outside the perimeter of the scar and opposite from each other.
- **Injection depth.** Dermal filler is injected in the superficial to mid-dermis for treatment of depression scars.
- **Cautions.** Ischemia and necrosis have been reported with injection of scars due to overfilling of tissue or vascular occlusion. Using thin dermal filler products, intradermal placement, low filler volumes, gentle plunger pressure, and keeping the needle slowly moving at all times in a retrograde fashion while injecting may reduce the likelihood of vascular compromise.



● = Dermal filler injection

**FIGURE 3** Overview of depression scar dermal filler injections.

## Performing the Procedure: Dermal Filler Treatment of Scars

### Anesthesia

1. Clean and prepare the scar area with alcohol.
2. Apply  $\frac{1}{2}$  g BLT as a thin layer to the scar areas using a cotton-tipped applicator or gloved finger (Fig. 2). Gently rub the BLT using small circular motions to enhance penetration into the skin. Occlusion with plastic wrap is not necessary.
3. Remove BLT 15–30 minutes after application using alcohol.

### Dermal Filler

1. Position the patient in a 60-degree reclined position.
2. Prepare the scars with alcohol.
3. The provider is positioned on the same side as the scar to be injected.
4. Attach a 30-gauge,  $\frac{1}{2}$ -inch needle to the prefilled HA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.

5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. Choose a side of the scar for the first fanning injection. Insert the needle just outside the perimeter of the scar at a 15-degree angle to the skin, and advance the needle until the tip reaches the midline of the scar. Apply firm and constant pressure on the syringe plunger while gradually withdrawing needle to inject a linear thread of filler in the superficial to mid-dermis. Without fully withdrawing the needle from the skin, fan the needle clockwise using small angulations to ensure dermal filler placement is contiguous (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section). Repeat until desired correction is achieved.
7. The second injection point is opposite the first, and dermal filler is injected as described above.
8. For larger scars, third and fourth injections may be required and are opposite to one another at 90 degrees to the above injections.
9. Smooth the scar and the perimeter of the scar using the first finger intraorally and a cotton-tipped applicator extraorally to compress any visible or palpable bumps of filler product.

### Tips

- Dermal filler can collect around the margin of some scars. If this is evident, discontinue injection, smooth the filler, and resume injecting from another point around the perimeter of the scar.
- The gray needle tip should not be visible through the skin. If this is observed, the needle is too superficial and should be redirected slightly deeper in the dermis without being fully withdrawn from the skin.
- Watch for tissue blanching and other ischemic signs or symptoms with scar injections. If ischemia occurs, manage as described in the Complications section.

### Results

- Reduction of scars is immediately evident at the time of treatment. Figure 1 shows a 50-year-old woman with scarring from previous autologous fat injection for cheek hollows, before (A) and 4 weeks after (B), treatment with 0.2-mL HA-lidocaine dermal filler, Juvederm Ultra XC.

### Duration of Effects and Subsequent Treatments

- Visible correction of scars typically lasts 6–9 months after treatment.
- Subsequent treatment with dermal filler is recommended when the volume of dermal filler product is visibly diminished and scars become more prominent again, prior to their pretreatment appearance.

### Follow-Ups and Management

Patients are assessed 4 weeks after treatment to evaluate for reduction of scars. Common issues reported by patients during this time include the following:

- **Bruising, swelling, erythema, and tenderness.** See Follow-Ups and Management in the Introduction and Foundation Concepts section.

- **Persistent scars.** Additional dermal filler may be necessary if a volume deficit persists. Typically 0.1–0.2 mL HA-lidocaine will achieve the desired result.

## Complications and Management

- General dermal filler complications and management are reviewed in the Complications section
- Bumpiness

**Bumpiness** can be visible if scars are not manually smoothed after treatment. If bumps are visible at the follow-up visit, compress as directed earlier.

## Combining Aesthetic Treatments and Maximizing Results

- **Skin resurfacing and collagen stimulating treatments.** Reduction of superficial depression scars can be improved by combining dermal fillers with skin resurfacing or collagen stimulating procedures such as ablative and nonablative lasers, dermabrasion, and chemical peels. With the more aggressive procedures such as ablative and fractional ablative lasers, dermabrasion, and medium-depth chemical peels, dermal filler treatments are performed after recovery. With less aggressive procedures such as nonablative lasers, superficial chemical peels, and microdermabrasion, dermal filler treatments may be performed in the same visit or prior to these procedures.
- **Dermatologic surgery.** Results with poorly distensible scars can be improved when combining subcision, whereby the fibrotic attachments to deeper tissues are released using a specialized blade or large gauge needle, with dermal filler treatment afterward.

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, the injector's skill, and vary according to community pricing in different geographic regions. Prices range from \$500 to \$800 per syringe of 0.8 mL HA for treatment of scars.

## Layering Dermal Fillers (Moderate to Severe Nasolabial Folds)



**FIGURE 1** ● Nasolabial fold before (A) and 4 weeks after (B) dermal filler treatment layering calcium hydroxylapatite and hyaluronic acid.

When treating facial areas that exhibit moderate to severe volume loss such as the nasolabial folds, marionette lines, and mental crease, improved outcomes can often be achieved by layering two types of dermal filler products. With this technique, a dermal filler with more structural support is used to provide a foundation in areas of deep dermal volume loss, and a thinner, more malleable dermal filler is overlaid to smooth superficial fine lines and wrinkles. These more complex layering techniques are considered advanced dermal filler treatments. Treatment of moderate to severe nasolabial folds is used in this chapter to illustrate the dermal filler layering technique.

### Indications

- Moderate to severe nasolabial folds

### Anatomy

- **Wrinkles, folds, and contours.** Nasolabial folds, or melolabial folds, course diagonally in the midface from the nasal ala toward the corner of the lip (see Dermal Filler

Anatomy, Figs. 1 and 2). The lateral nasal artery is the main vascular supply for the nasal tip and ala, and is in close proximity to the nasolabial fold, 2–3 mm superior to the nasal alar groove (see Dermal Filler Anatomy, Figs. 3 and 5).

## Patient Assessment

- Patients with moderate to severe nasolabial folds are assessed for areas of deep volume loss, visible as concave contours, and superficial wrinkles. Patients with both of these findings typically achieve the best results with dermal filler treatments using the layering technique outlined in this chapter.
- Patients presenting with excess laxity and hanging skin folds usually require surgical intervention for significant improvement.
- Patients with nasolabial folds may also have volume deficits in the malar area. If significant malar flattening is present, it is advisable to perform malar augmentation first and reassess nasolabial folds at the follow-up visit. Restoring midface volume often reduces nasolabial folds and smaller treatment volumes for the nasolabial folds may be required after malar augmentation is performed (see Malar Augmentation chapter).

## Contraindications

- See Contraindications in the Introduction and Foundation Concepts section.

## Treatment Goals

- Reduction of nasolabial folds without full effacement.

## Recommended Dermal Filler Product

- Areas of deep volume loss are ideally treated with dermal filler products that offer more structural support such as Radiesse® or Perlane-L® (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section).
- Superficial lines are ideally treated with thinner, more supple dermal filler products such as Juvederm® Ultra XC or Prevelle Silk® (see Basic and Advanced Procedures in the Introduction and Foundation Concepts section).
- This chapter describes layering treatment of nasolabial folds with the following products:
  - **Deep volume loss areas** are treated with Radiesse, a calcium hydroxylapatite (CaHA) filler. CaHA is mixed with lidocaine (CaHA-lidocaine).
  - **Superficial lines** are treated with Juvederm Ultra XC (hyaluronic acid-lidocaine).

## Dermal Filler Treatment Volumes

- The estimated dermal filler volume necessary for treatment is based on patients' observed facial anatomy and volume loss in the treatment area.
- Layering for treatment of moderate to severe nasolabial folds typically requires a total volume of 1.2–1.6 mL CaHA-lidocaine (Radiesse).

- Layering for treatment of moderate to severe nasolabial folds typically requires a total volume of 0.6–0.8 mL HA-lidocaine (Juvederm Ultra XC).

## Equipment for Anesthesia

- Local infiltration injection supplies (see Equipment for Injectable Anesthetics in the Anesthesia section)
- Lidocaine HCl 2% with epinephrine 1:100,000 buffered (referred to as buffered 2% lidocaine-epinephrine solution)
- 30 gauge,  $\frac{1}{2}$  inch needle

## Equipment for Dermal Filler Procedure

- General dermal filler injection supplies (see Equipment in the Introduction and Foundation Concepts section)
- CaHA mixing supplies (see Equipment in the Introduction and Foundation Concepts section)
- 27-gauge, 1- $\frac{1}{4}$  inch needle for CaHA-lidocaine
- 30-gauge  $\frac{1}{2}$ -inch needle for HA-lidocaine

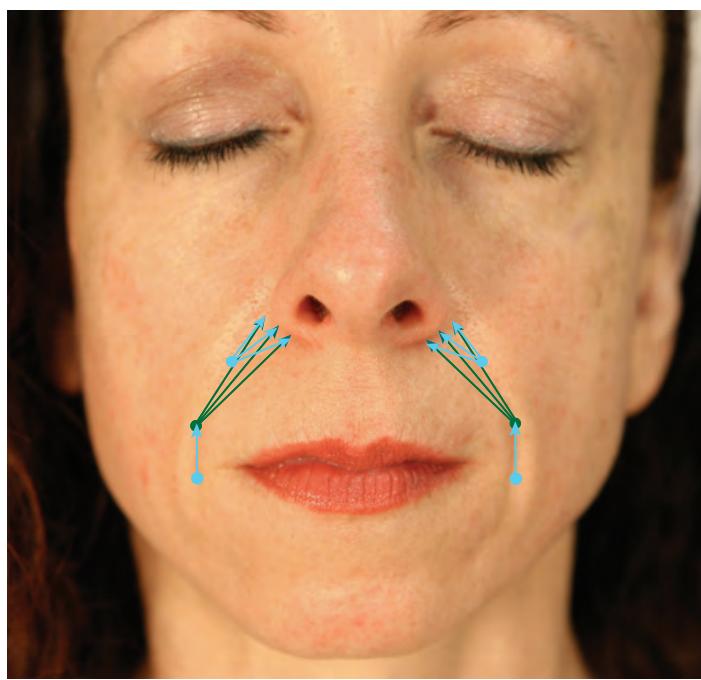
## Anesthesia Overview

- **Local lidocaine infiltration.** Buffered 2% lidocaine-epinephrine solution can be used to achieve anesthesia for nasolabial folds. Both folds are anesthetized using six injections of 0.1 mL for a total volume of 0.6 mL (Fig. 2).



● = 0.1 mL Lidocaine

**FIGURE 2** ● Anesthesia for nasolabial fold dermal filler treatment.



● = Calcium hydroxylapatite dermal filler   ● = Hyaluronic acid dermal filler

**FIGURE 3** Overview of nasolabial fold dermal filler layering technique.

- See the Injectable Anesthetics in the Anesthesia chapter for additional information on local infiltration methods. Sensitivity increases with proximity to the nose and injections are started at the inferior portion of the fold.

## Dermal Filler Procedure Overview

- **Overview.** An overview of injection points and techniques for layering dermal fillers in the nasolabial folds, using CaHA-lidocaine and HA-lidocaine, is shown in Figure 3. First, dermal filler products with more structural support (CaHA-lidocaine) are injected in areas of deep volume loss. More supple dermal filler products (HA-lidocaine) are then used to smooth superficial wrinkles, typically in the superior and inferior portions of the nasolabial folds.
- **CaHA-lidocaine preparation** is performed at the time of treatment (see Calcium Hydroxylapatite and Lidocaine Preparations in the Introduction and Foundation Concepts section).
- **Number of injections and injection depth** (see Techniques for Dermal Filler Injection in the Introduction and Foundation Concepts section).
  - **For CaHA-lidocaine**, there is one fanning injection per side of the face and injections are placed in the deep dermis.
  - **For HA-lidocaine**, there is typically one fanning injection for the superior portion, and one linear thread injection for the inferior portion of the nasolabial fold on each side of the face. Injections are placed in the superficial to mid-dermis.
- **Cautions.** The lateral nasal artery is the main vascular supply for the nasal tip and ala, and is avoided with treatment of nasolabial folds.

## Performing the Procedure: Dermal Filler Layering for Nasolabial Folds

### Anesthesia

1. Clean and prepare the skin lateral to the nasolabial folds with alcohol.
2. Inject buffered 2% lidocaine-epinephrine solution subcutaneously as shown in Figure 2.
3. Allow a few minutes for anesthesia.

### Dermal Filler for Deep Volume Loss—Calcium Hydroxylapatite

1. Position the patient in a 60-degree reclined position.
2. Clean and prepare the skin of the nasolabial folds with alcohol.
3. The provider is positioned on the same side as the nasolabial fold to be injected.
4. Attach a 27-gauge, 1¼-inch needle to the prepared CaHA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
5. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
6. Determine the first insertion point by laying the needle just medial to the nasolabial fold such that the needle tip is 1 mm below the nasal ala. The first injection point is at the needle hub (Fig. 4).
7. Insert the needle at a 30-degree angle to the skin, directing it superiorly toward the nasal ala and advance to the needle hub. Apply firm and constant pressure on the syringe

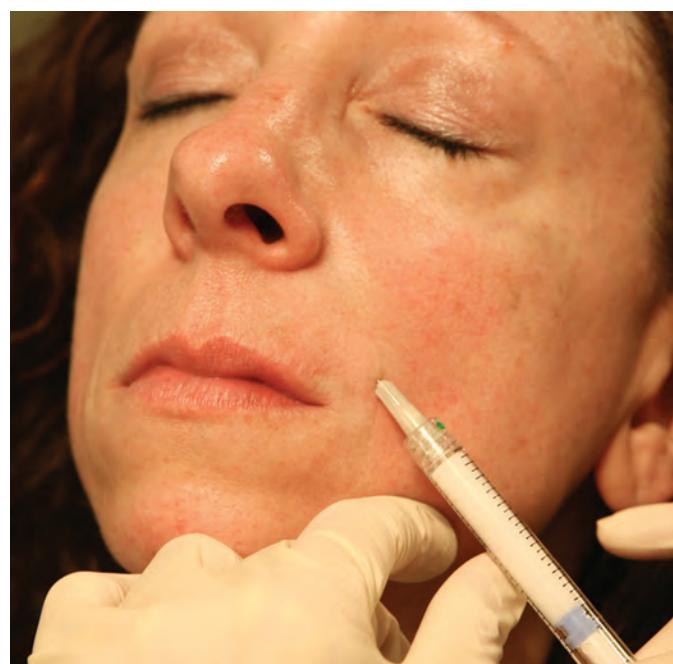


**FIGURE 4** Calcium hydroxylapatite needle insertion for treatment of the nasolabial folds.

plunger while gradually withdrawing needle to inject a linear thread of filler in the deep dermis just medial to the nasolabial fold. Without fully withdrawing the needle from the skin, fan the needle inferomedially, using small angulations to ensure dermal filler placement is contiguous (Figs. 5A and 5B). Repeat until desired correction is achieved.



A



B

**FIGURE 5** Calcium hydroxylapatite for treatment of the nasolabial folds: fanning from (A) to (B).

8. Compress the treatment areas with one finger intraorally and the thumb on the skin, using firm pressure to smooth any visible or palpable bumps of filler product.
9. Reposition to the opposite side and repeat the above injection for the other nasolabial fold.

### Dermal Filler for Superficial Lines—Hyaluronic Acid

1. Repeat steps 1–3 as described above.
2. Attach a 30-gauge,  $\frac{1}{2}$ -inch needle to the prefilled HA-lidocaine dermal filler syringe. Ensure that the needle is firmly affixed to the dermal filler syringe to prevent the needle popping off when plunger pressure is applied.
3. Prime the needle by depressing the syringe plunger until a small amount of dermal filler extrudes from the needle tip.
4. For the superior portion of the nasolabial fold, the needle insertion point is one needle length inferior to the nasal ala, just medial to the nasolabial fold. Insert the needle at a 30-degree angle to the skin, directing it superiorly toward the nasal ala and advance to the needle hub. Apply firm and constant pressure on the syringe plunger while gradually withdrawing needle to inject a linear thread of filler in the superficial dermis just medial to the nasolabial fold; without fully withdrawing the needle from the skin, fan the needle inferomedially, using small angulations to ensure dermal filler placement is contiguous (Figs. 6A and 6B). Repeat until desired correction is achieved.
5. Compress the treatment areas with one finger intraorally and the thumb on the skin, using firm pressure to smooth any visible or palpable bumps of filler product.
6. For the inferior portion of the nasolabial fold, the needle insertion point is at the inferior end of the nasolabial fold. Insert the needle at a 30-degree angle to the skin, directing it superiorly toward the nasal ala and advance to the needle hub. Apply firm and constant pressure on the syringe plunger while gradually withdrawing needle to inject a linear thread of filler in the superficial dermis (Fig. 7).
7. Reposition to the opposite side and repeat the above injections for the other nasolabial fold.

### Tips

- Avoid placing CaHA in the superficial dermis as this may result in an undesirable visible ridge of filler which does not readily compress.
- Avoid treating lateral to the nasolabial folds as this can exacerbate the folds.
- Watch for tissue blanching or other ischemic signs and symptoms. If ischemia occurs, manage as described in the Complications section.

### Results

- Reduction of nasolabial folds is immediately evident at the time of treatment. Figure 8 shows a 46-year-old woman with severe nasolabial folds immediately after dermal filler layering treatment of the left half of the face. Dermal filler volumes for treatment of both nasolabial folds were 1.5 mL CaHA-lidocaine (Radiesse) and 0.8-mL HA (Juvederm Ultra Plus). Figure 1 shows the same patient before (A) and 4 weeks after (B) the layering treatment.

### Duration of Effects and Subsequent Treatments

- CaHA dermal filler typically lasts 18 months and HA dermal filler typically lasts 6 months to 1 year.



**FIGURE 6** ● Hyaluronic acid layering for treatment of the superior nasolabial folds: fanning from **(A)** to **(B)**.

- Subsequent treatment with dermal filler is recommended when the volume of dermal filler product is visibly diminished and the nasolabial folds are more evident, prior to their pretreatment appearance. With layering of dermal fillers in the nasolabial folds, a subsequent treatment with HA dermal filler only is typically performed at 6–9 months.



**FIGURE 7** ● Hyaluronic acid treatment of the inferior nasolabial fold.



**FIGURE 8** ● Left half of the face treated with layering of calcium hydroxylapatite and hyaluronic acid dermal fillers.

## Follow-Ups and Management

Patients are assessed 4 weeks after treatment to evaluate for reduction of the nasolabial folds. Common issues reported by patients during this time include the following:

- **Bruising, swelling, erythema, and tenderness.** See Follow-up section for recommendations and management strategies in the Introduction and Foundation Concepts section.
- **Persistent nasolabial folds.** Patients should be assessed for the following:
  - **Static nasolabial folds.** Additional dermal filler may be necessary if a volume deficit persists. Typically 0.4–0.8 mL HA-lidocaine will achieve the desired result.
  - **Dynamic nasolabial folds.** Combination treatment with botulinum toxin may be required to achieve optimal results in patients with deep dynamic nasolabial folds, see Combining Aesthetic Treatments later.

## Complications and Management

- General dermal filler complications and management are reviewed in the Complications section
- Tissue ischemia and tissue necrosis

**Tissue ischemia** resulting from intravascular injection and occlusion of the angular artery may occur with nasolabial fold treatments. Signs of vascular compromise and ischemia include a violaceous reticular pattern or white blanching, and may be painful or painless. These changes may be seen on the nose and/or nasolabial fold, and can present immediately, or be delayed. One case report identified ischemic changes 6 hours after dermal filler treatment. Ischemia is managed urgently as it can rapidly progress to **tissue necrosis** (see Complications section).

## Combining Aesthetic Treatments and Maximizing Results

- **Botulinum toxin.** Some patients have excessive contraction of the lip levator muscles during smiling, resulting in deep nasolabial folds and a “gummy” smile. In these patients, combining dermal filler treatment of the nasolabial fold with botulinum toxin treatment of the levator labii superioris alaeque nasi muscle can improve reduction of nasolabial folds.
- **Dermal filler in adjacent areas.** Patients requiring nasolabial fold treatment may also have volume deficits in the malar area. It is advisable to perform malar augmentation first and reassess nasolabial folds at the follow-up visit (see Malar Augmentation chapter).

## Pricing

Dermal filler fees are based on the type of filler used, size and number of syringes, the injector’s skill, and vary according to community pricing in different geographic regions. Prices range from \$500 to \$800 per syringe of 0.8 mL HA and \$650 to \$1200 per syringe of 1.5 mL CaHA for layering treatment of nasolabial folds with moderate to severe volume loss.