Section V

Filler Injection Techniques

V

38
Filler Injection for Nasolabial Folds

Difficulty: ●
Patient Satisfaction: ●●●
Risk: ●●

Indications

The nasolabial fold (NLF), the groove from the corner of the nose to the outer corner of the mouth, is perhaps one of the most maligned, studied, poked, filled, and worried-about features in facial cosmetic surgery. It is present in youth, deepens with the aging process, and is not well addressed by facelift surgery. It is the site of most "on-label" filler product applications, it is easiest to study as it has a built-in control (the opposite side), and there are good grading scales that have long been agreed upon to describe various severities of the notorious fold. In the quest to eradicate this bane of the aging face, it important to consider that not all faces should be completely "nasolabial fold-free," and in fact complete flattening or overfilling of the fold produces quite an unnatural appearance. Some NLFs are etched creases in the skin, whereas others are deep structural folds transitioning from the lip to full "apple" cheeks.

Anatomic Considerations

Volumetric loss of the malar mound and descent of the cheek can contribute to folding over of the skin lateral to the fold. Thinning of the upper lip and perioral complex can lead to sinking of the medial portion of the fold. Injection deep into the area near the corner of the nasal ala can be perilously close to the angular artery, a branch of the facial artery.

Injection Technique

Placement of product in this region may be performed by using the cross-hatching, fanning, linear threading, or serial puncture techniques. The product generally is placed at varying depths, deeper for folds and more superficial for wrinkles. The area injected should be massaged into place after injection to minimize lumpiness. The injection technique should be mostly perpendicular to and medial to the fold, just barely crossing or coming to the edge of the fold so as not to augment lateral to the fold. It is best to imagine a tall, thin, triangular deficit in front of the fold that must be filled with fanning or threading injections rather than large boluses, or a fat sausage roll placed parallel to and under the fold.

Alternate Technique

Injection can begin as described above with filler placed in a deeper plane, perpendicular to the fold, to act as scaffolding. A second layer is placed more superficially parallel to and slightly medial to the fold. A fanning technique can be

performed at the nasal–alar junction, with care being taken not to inject the angular artery.

Precautions

Injecting deeply onto bone at the corner of the nasal ala, near the pyriform aperture, can provide nice elevation of a deep fold. However, extreme caution must be used with proper placement and either aspiration or perhaps the use of a blunt cannula to avoid intravascular injection. Superficial injections, especially parallel to the fold, will increase the risk of the Tyndall effect.

Post-Injection Instructions

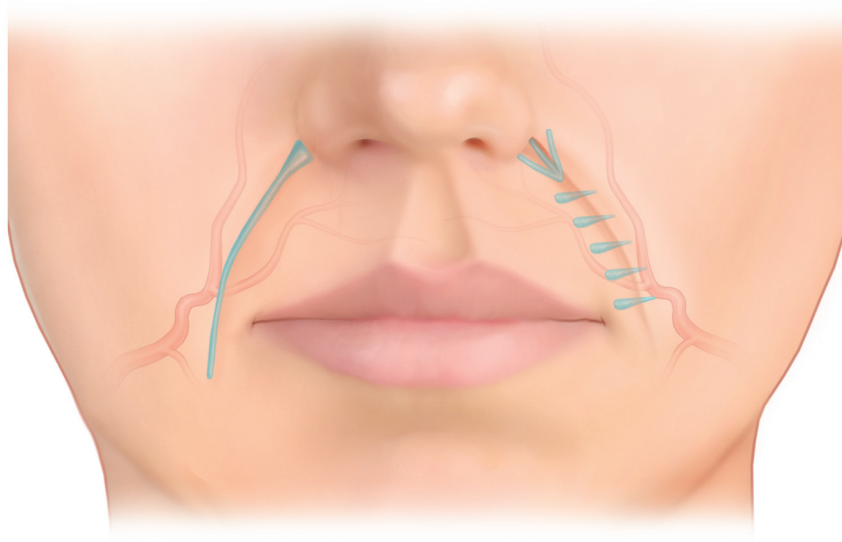
Ice and pressure are helpful to prevent bruising in this region. The product will swell some with hyaluronic acid (HA) and feel firmer to palpation the first week, and then blend in more naturally. This is also true of CaHA injections, which become firm, then soften over time.

Risks

Minimal risks exist other than bruising and Tyndall effect from too superficial injection into the dermis.

Pearls of Injection

- Overcorrection of the nasolabial fold can look unnatural and should not be overly flattened.
- Many products have been approved for use in this region including HA, CaHA, and PMMA. All are injected similarly, with care being taken to place CaHA and PMMA deep in the superficial subcutaneous layers and avoid more superficial injection.
- PMMA is a permanent filler, and patients are generally “under-filled” initially, with re-injection 6 weeks later.



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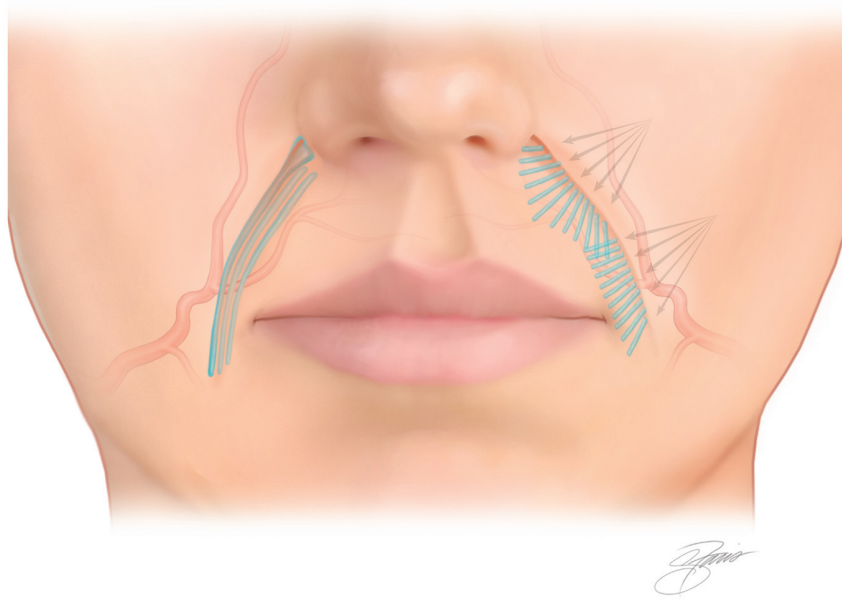


b

Fig. 38.1 Possible techniques to treat the nasolabial fold are shown. The injector may choose to perform a combination of these techniques to achieve maximum correction of the fold. (**a**) Filler may be placed along the depth of the fold as well as horizontally to act as a scaffold for the filler. Fanning technique can be performed at the nasal–alar crease. (**b**) Some patients will require the placement of more filler medial to the fold, as shown.

Additional Reading

[1] Bass LS, Smith S, Busso M, McClaren M. Calcium hydroxylapatite (Radiesse) for treatment of nasolabial folds: long-term safety and efficacy results. Aesthet Surg J. 2010; 30 (2):235–238

[2] Fedok FG. Advances in minimally invasive facial rejuvenation. Curr Opin Otolaryngol Head Neck Surg. 2008; 16(4):359–368

[3] Lee JC, Lorenc ZP. Synthetic Fillers for Facial Rejuvenation. Clin Plast Surg. 2016; 43(3):497–503

[4] Lupo MP, Smith SR, Thomas JA, Murphy DK, Beddingfield FC , III. Effectiveness of Juvéderm Ultra Plus dermal filler in the treatment of severe nasolabial folds. Plast Reconstr Surg. 2008; 121(1):289–297

[5] Narins RS, Dayan SH, Brandt FS, Baldwin EK. Persistence and improvement of nasolabial fold correction with nonanimal-stabilized hyaluronic acid 100,000 gel particles/mL filler on two retreatment schedules: results up to 18 months on two retreatment schedules. Dermatol Surg. 2008; 34 Suppl 1:S2–S8, discussion S8

39
Filler Injection with Polymethyl Methacrylate (Bellafill)

Difficulty: ●●●●
Patient Satisfaction: ●●
Risk: ●●●

Indications

Polymethyl methacrylate (PMMA) is used as a permanent filler for improving the nasolabial folds. This filler is most often used in patients who have used absorbable fillers and desire a more permanent correction. This is also a filler to consider for men, who often do not want to undergo multiple treatments.

Anatomic Considerations

Because of its permanence, we prefer to use this product only in the nasolabial folds, cheeks, and marionette lines. It is contraindicated for use in the lips.

Injection Technique

Injection should be placed in the subdermal plane. The product is stored in the refrigerator and must be allowed to come to room temperature prior to injection. Retrograde tunneling, cross-hatching, or depot injection techniques are appropriate.

Precautions

The PMMA microspheres are suspended in a bovine collagen matrix. A skin test is required prior to injection to determine if the patient has an allergy to bovine collagen. Some injectors avoid permanent fillers altogether because of the historic risk of long-term sequelae as well as the changes that happen to the aging face, to which the permanent injectable implants may not adapt.

Post-Injection Instructions

Ice as needed.

Risks

Do not overcorrect with this product. Fill to 80% correction with the first treatment and give 20% more at the second treatment, usually 4 to 6 weeks later. Nodules may form if the product is injected into the lips or around the eyes. Because of the large particle size, care must be taken to avoid intravascular injection and possible vessel occlusion.

Pearls of Injection

- Polymethyl methacrylate should be used with caution in patients who are filler naive. It may be preferable to inject patients first with a reversible or semi-permanent filler.
- The bovine collagen matrix absorbs in 4 weeks, so a second treatment should be performed at that time.

- Patients should be informed that their results will actually improve over time as the body forms collagen around the PMMA particles. Thus their 5-year results may look better than their 1-year results.

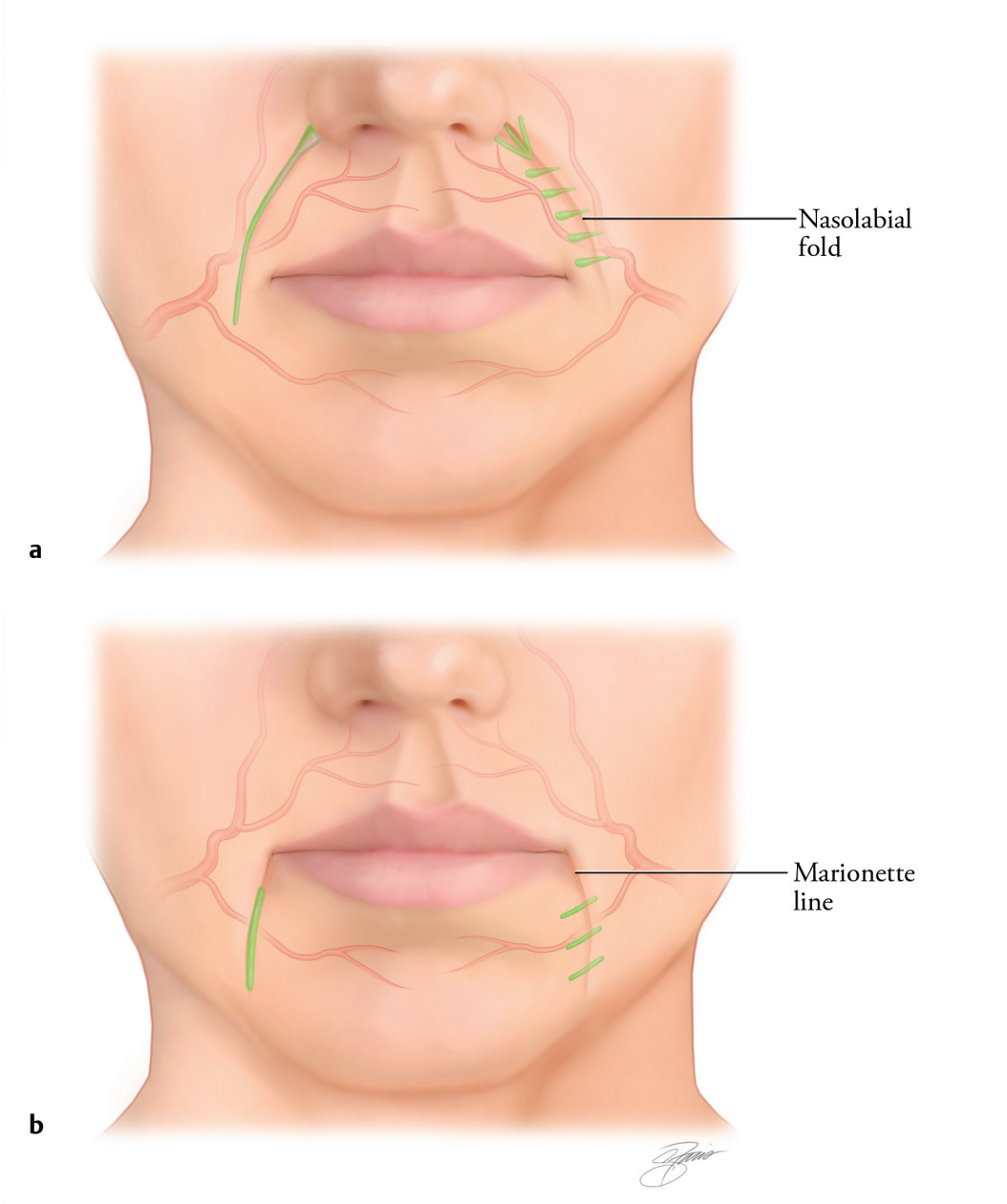


Fig. 39.1 (**a**) Polymethyl methacrylate (PMMA) is placed in the subcutaneous tissue to augment the nasolabial fold. Injections can be placed along the fold as shown, or these techniques can be combined as needed to optimize results. (**b**) The marionette lines can be treated similarly with either technique shown or a combination of these techniques.

Additional Reading

[1] Cohen SR, Berner CF, Busso M, et al. Five-year safety and efficacy of a novel polymethylmethacrylate aesthetic soft tissue filler for the correction of nasolabial folds. Dermatol Surg. 2007; 33 Suppl 2:S222–S230

[2] Hilinski JM, Cohen SR. Soft tissue augmentation with ArteFill. Facial Plast Surg. 2009; 25(2):114–119

[3] Lemperle G, Knapp TR, Sadick NS, Lemperle SM. ArteFill permanent injectable for soft tissue augmentation: I. Mechanism of action and injection techniques. Aesthetic Plast Surg. 2010; 34(3):264–272

40
Fine Line Fillers and Skin Boosters

Difficulty: ●●●●
Patient Satisfaction: ●●●
Risk: ●●

Indications

A common complaint among female patients is that fine lines or wrinkles are present around the mouth, on the cheeks vertically, or around the eyes. Often the clinician dreads this complaint as they perceive that the patient has a critical eye and foresee that the remedy will not be a simple one. Fine lines, as opposed to folds or hollows, require different injection techniques and are often more time intensive to treat.

Anatomic Considerations

Fine rhytids are a symptom of thinning skin often due to advancing age in combination with photoaging. Genetic factors, including lower Fitzpatrick skin type, are predisposing to developing fine lines on the face. These fine lines may develop in younger patients and then turn into deeper etched lines or may become diffuse over time. Injection of hyaluronic filler into the sub-dermis or deep dermis often results in fullness or ridging without effacement of the fine lines at all. The superficial nature of the rhytid and the very thinness of the skin itself lead to the skill necessary to appropriately treat these lines.

Injection Technique

Careful product selection and injection technique will make a world of difference in achieving better outcomes for fine lines. The choice of lower concentration HA fillers and ones with lower G´s will often limit the risk of surface visibility and ridging. Typical choices would include Restylane Silk, Volbella, Vollure, and Belotero. For lines and creases in weathered or thicker skin a firmer filler, such as Restylane-L, may be more appropriate. The technique is painstaking and slow and often involves some degree of discomfort for the patient as stretching of the dermis is painful in general. Use of a small-gauge needle, such as 30-gauge or smaller, is appropriate to thread parallel to and often perpendicular to the lines in question, in order to firm and thicken the area that is wrinkling due to thinning. This technique of evenly crosshatching an area to firm the skin, or injecting intradermally in micro-aliquots using the depot technique, is known as “skin boosting.” Following and threading multiple fine parallel lines across the cheeks can be a slow and tenuous process. From a cost/benefit basis, it may be worth considering charging extra for this injection process.

When treating crow’s feet or radiating lines in the brow with filler a trio of passes with the needle can work nicely. Each pass will be superficial enough to

see the movement of the needle and feel the resistance of the dermis. The first pass will be right under the rhytid and then one each parallel and just to either side of the midline. This technique also works well for single long, lateral cheek lines to efface and prevent ridging from occurring.

Another technique that can be used to efface lines after they have been injected linearly is to place the needle just into the epidermis and inject slowly to allow the product to diffuse into the tissue. The line is then treated in a very superficial depot fashion. This works nicely using Belotero and Refyne.

Precautions

Attempting to inject in the superficial layer of the skin with HA can involve several risks: (1) over-injection in the superficial plane resulting in a worm-like ridge or bump, (2) Tyndall effect, or (3) injecting too deeply and missing the intended target.

Post-Injection Instructions

Bruising is common after multiple needle injection sites so pressure is important as well as ice following the treatment.

Risks

As the injection is very superficial, the risk for intravascular injection should be very low. It is recommended to perform retrograde injection to further minimize complications.

Pearls of Injection

- Skin boosting can be used to treat many areas of the face and even neck and chest skin to treat and prevent fine lines.
- A metered 0.01-mL click syringe adapter for uniform dose product placement may be on the horizon to aid in skin-boosting applications.

Fig. 40.1 Fine lines can be treated with very superficial injection of fillers with low G′. Stretching the skin while injecting helps keep the injection superficial.

Additional Reading

[1] Bertucci V, Lynde CB. Current concepts in the use of small-particle hyaluronic acid. Plast Reconstr Surg. 2015; 136(5) Suppl:132S–138S

[2] Streker M, Reuther T, Krueger N, Kerscher M. Stabilized hyaluronic acid-based gel of non-animal origin for skin rejuvenation: face, hand, and décolletage. J Drugs Dermatol. 2013; 12 (9):990–994

41
Filler Injection for Marionette Lines

Difficulty: ●
Patient Satisfaction: ●●
Risk: ●

Indications

The groove that descends vertically from the corner of the mouth toward the mandible is known as the marionette line, drool line, or melolabial groove. These folds are prominent contributors to signs of facial aging due to volume loss in the prejowl region, and may create a sad, tired, and more aged facial countenance.

Anatomic Considerations

The action of the depressor anguli oris (DAO) muscle underlies the melolabial groove and acts to deepen the groove. Volumetric loss of the prejowl and chin soft tissues can also lead to deepening this region.

Injection Technique

The injection technique should be perpendicular to and medial to the fold so as not to augment lateral to the fold. It can be helpful to pinch or squeeze the fold with the thumb and first finger on either side of the line down onto the chin to accentuate the line and demonstrate its extent. This technique will also demonstrate the accessory lines that are generally parallel to the marionette lines, and other weakened areas of skin and volume loss in the vicinity. Once those are determined, the appropriate treatment can begin. Fill should occur in the areas of concavity, avoiding thicker areas of convexity.

Precautions

Undercorrection of this area will lead to unsatisfactory results, and patients will feel "that it didn't make much difference." It can often take 1 mL of product in each marionette line to correct the entire area and blend in on the chin and all the way down toward the mandible, not even including the prejowl or along the mandibular border, to achieve a proper correction.

Post-Injection Instructions

Ice and pressure are helpful to prevent bruising. The product will swell some with an HA and feel firmer to palpation the first week and then blend in more naturally. Massage of the area after injection can help reduce lumpiness.

Risks

Minimal risks exist other than bruising and Tyndall effect from overly superficial injection into the dermis.

Pearls of Injection

- Overcorrection of this area is unlikely, unless there are no lines to begin with before injection.
- Bruising is quite common.
- As this area blends in with the oral commissure, techniques to augment the oral commissure will assist in improving the appearance of this fold.

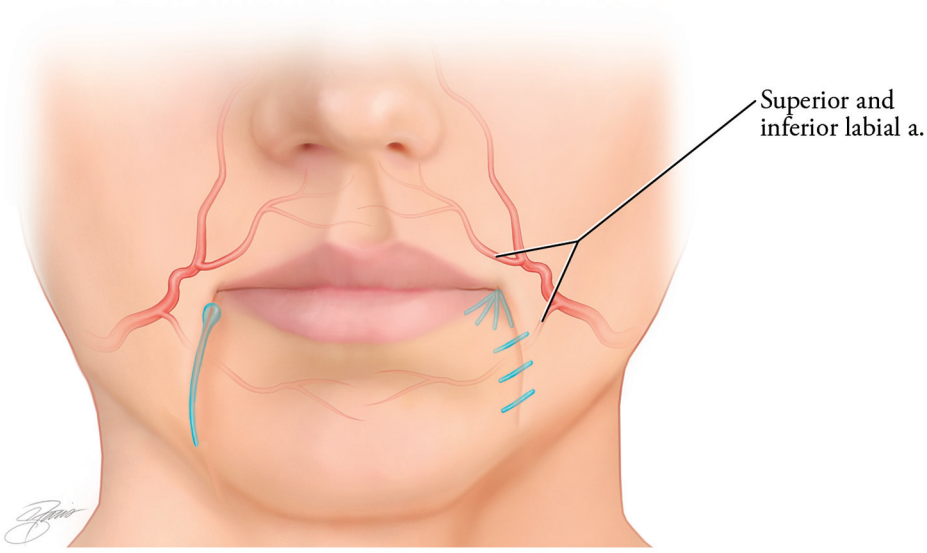


Fig. 41.1 A combination of techniques may be necessary to improve this region, including injection into the fold, horizontal filling across the fold, and fanning at the oral commissure. Combine techniques as needed to obtain the desired clinical result.

Additional Reading

[1] Jansen DA, Graivier MH. Evaluation of a calcium hydroxylapatite-based implant (Radiesse) for facial soft-tissue augmentation. Plast Reconstr Surg. 2006; 118(3) Suppl:22S–30S, discussion 31S–33S

[2] Wise JB, Greco T. Injectable treatments for the aging face. Facial Plast Surg. 2006; 22(2):140–146

42
Filler Injection for Lip Augmentation

Difficulty: ●
Patient Satisfaction: ●●
Risk: ●●

Indications

One of the most requested filler treatments is that of lip rejuvenation or augmentation. Unfortunately, poor technique in performing this injection has resulted in patients being fearful of unnatural and overdone results.

Anatomic Considerations

It is important when filling the lips to decide what area needs to be augmented: the volume of the lip, the outline, or both. The lips can be accentuated and shaped by filling the vermillion border. There is a potential space that, if entered accurately, will allow the product to track along the lip margin.

Volume can be placed in the body (pink) of the lips for augmentation or rejuvenation, or to improve symmetry. The ideal lip ratio for upper to lower lip is 1:1.6. Achieving this ratio produces natural-looking lips.

Often overlooked are the philtral columns, which flatten with aging. A small amount of filler to accentuate the philtrum will give more definition to cupid's bow and slightly evert the upper lip.

Injection Technique

Only HA fillers should be used to augment the lips. Filler injections into the lips can be quite painful. A dental block or topical anesthetic may be placed prior to injection. Some injectors believe that no anesthetic is necessary when using fillers with added lidocaine. A skillful injector will inject slowly and enter the skin in areas previously injected that have become anesthetized. These injections are generally placed in the superficial subcutaneous plane. Massage after injection helps to evenly distribute the product.

Injection of the vermillion proceeds from lateral to medial. Palpation is important to feel how far along the vermillion the filler has traveled and to detect untreated or skipped areas. Injection may be performed in an anterograde fashion as the filler can track along a plane along the vermillion. Alternatively, filler may be placed in a retrograde fashion.

The body of the lips can be improved by filling in the zones that require augmentation. Do not think of the lip as one long unit but rather as smaller subunits, and fill appropriately. Overdone lips are usually the result of overfilling the lip without paying attention to aesthetic units. Do not fill the lips like "filling a sausage."

The philtral columns can be redefined using a small amount of filler. Pinch the

philtrum after injection to further define the ridges.

Precautions

As a general rule, do not inject more than 2 mL into the lips at one time. Avoid over-injection of the upper lip, especially in patients with very small lips. Rather than over-filling small lips, consider the adjunctive use of BoNTA to evert and lift the lips (see also Chapter 16).

Post-Injection Instructions

Ice as needed. Bruising and edema are likely. Advise patients that the edema will subside in a few days.

Risks

Injections into the lips can stimulate recurrence of herpes simplex viral eruptions. Any patient receiving lip injections who has a history of fever blisters should be placed on a short course of antiviral medication.

Pearls of Injection

- Consider treating the oral commissures when treating the lips (see also Chapter 15).
- Take photographs prior to performing the dental block, as the block itself will likely produce some asymmetries. Once the injection is completed, persistent asymmetries may be evident. Wait until the effects of the local anesthetic and swelling/bruising have worn off before assessing the final results.
- Because of its hydrophilic properties and syrup-like consistency, Juvéderm may be preferable for use in the body of the lips.
- For deep upper lip rhytids or to create a well-defined vermillion border, Restylane is often the product of choice.
- If swelling is a concern, Volbella and Restylane Refyne seem to swell the least in the author's experience.
- Restylane Silk and Volbella both feel very soft and can be used close to the upper dermis, but are not as good for effacement of deeper perioral rhytids.

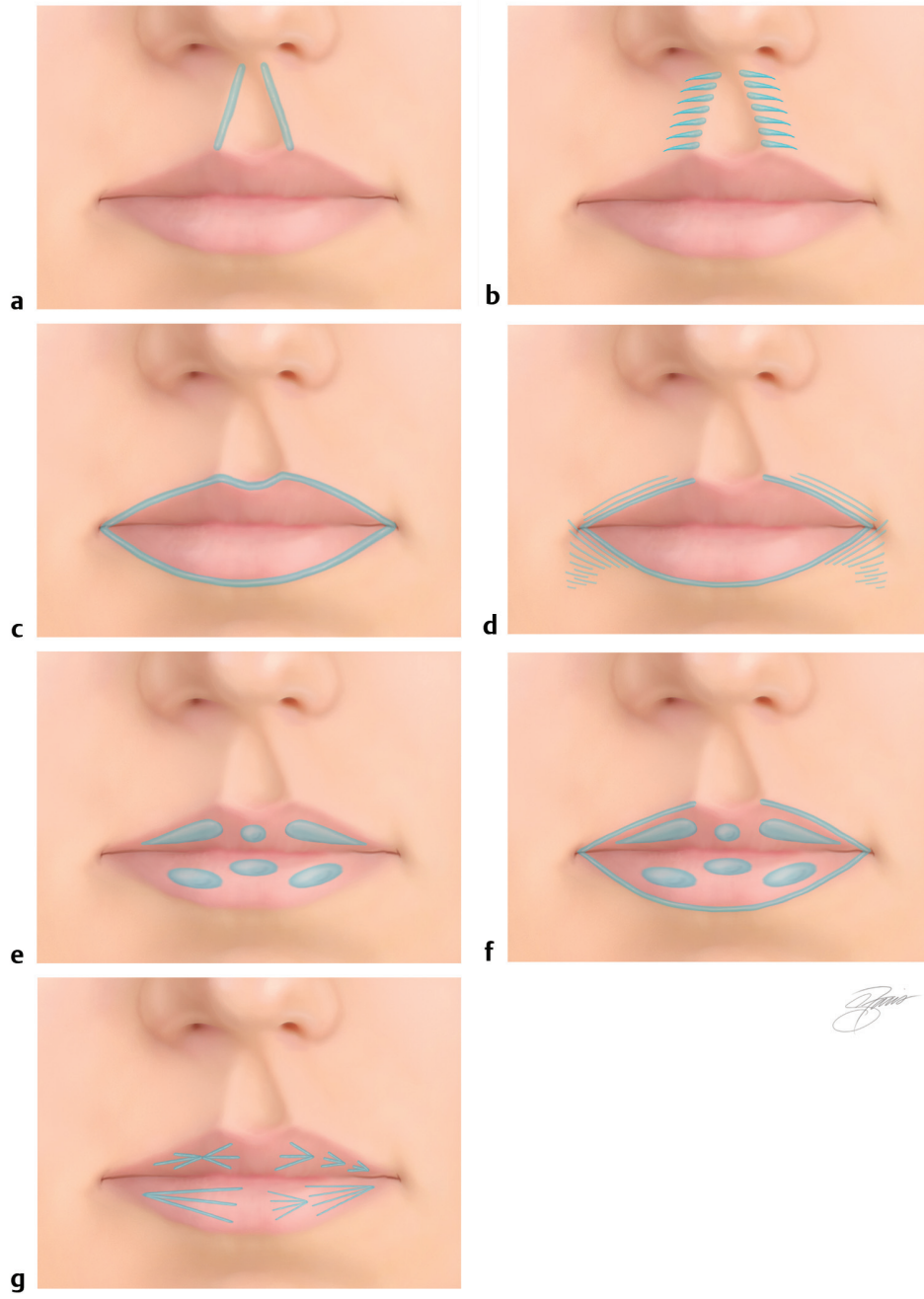


Fig. 42.1 Filler injections for lip augmentation. (**a**) The philtral columns can be augmented linearly along the fold. (**b**) Alternatively, the philtral columns can be augmented with small horizontal retrograde injections injected medial to lateral. (**c**) Definition of the lips is accomplished by augmenting the vermillion border, injection either retrograde or anterograde, from lateral to medial. (**d**) Small amounts of filler may need to be placed outside the vermillion after augmentation to decrease shadowing. (**e**) Lip fullness is achieved by directed injection into the body of the lips, artistically filling in deficient areas. (**f**) A combination of these techniques may be necessary to achieve the desired results. (**g**) Fanning technique to smooth pink lip often used for Volbella or Restylane Silk.

Additional Reading

[1] Bass LS. Injectable filler techniques for facial rejuvenation, volumization, and augmentation. Facial Plast Surg Clin North Am. 2015; 23(4):479–488

[2] Jacono AA. A new classification of lip zones to customize injectable lip augmentation. Arch Facial Plast Surg. 2008; 10 (1):25–29

[3] Sarnoff DS, Saini R, Gotkin RH. Comparison of filling agents for lip augmentation. Aesthet Surg J. 2008; 28 (5):556–563

[4] Sclafani AP. Soft tissue fillers for management of the aging perioral complex. Facial Plast Surg. 2005; 21(1):74–78

43
Filler Injection for Elevating the Oral Commissures

Difficulty: ●●
Patient Satisfaction: ●●
Risk: ●●

Indications

The corner of the mouth, known as the oral commissure, turns downward with age, and often there is a genetic predisposition to this downward turn. Filling the oral commissure can significantly alter the sad or angry appearance; it can "turn a frown upside down."

Anatomic Considerations

In childhood, the corner of the mouth turns up in a slight smile. In the teens to early twenties, the commissure becomes level to neutral in position. It is not until later in life, when skin, soft tissue, and volumetric loss in the lower face and chin develop, that the oral commissure angle drops and may become turned downward or negative in its vector. When this occurs, the overall effect is one of a mistakenly sad, tired, or stern facial countenance.

Injection Technique

The most frequently used products in this area are the hyaluronic acids (HAs). The injection technique involves placing an X-like injection at the oral commissure. A depot of product inferiorly also can help turn the commissure upward. Occasionally an injection of filler can be placed perpendicular to the commissure. A slight immediate overcorrection, which takes a down-turned lip and makes it into a slightly up-curved lip at the corner, is necessary to achieve a good result when the swelling subsides. Also, because this is such a highly mobile area it is necessary to use an adequate amount of product in the space or the effect will be relatively short lived.

Precautions

It is important to advise patients that they will experience an overcorrection at first, and that they should not be alarmed by a slight "joker-like" smile at first. This will resolve once the swelling subsides.

Post-Injection Instructions

Ice and pressure are helpful to prevent bruising. Bruising and a sense of firmness or hardness in the corner are not uncommon. Gentle massage also may be necessary post injection as lumpiness can occasionally be palpable intraorally.

Risks

Minimal risks occur besides bruising and the Tyndall effect from overly superficial injection into the dermis.

Pearls of Injection

- The action of the depressor anguli oris (DAO) muscle pulls the corners down. In

cases where fillers result in inadequate upturning of the commissures, consider also treating the DAO with BoNTA (see also Chapter 15).

- The use of a firmer HA is appropriate in this area. Commonly used products include Restylane, Restylane Lyft, Juvéderm Ultra or Ultra Plus, Voluma, Restylane Refyne, Restylane Defyne, and Vollure. The thinner products, such as Volbella, Restylane Silk, and Belotero, can be used for fine lines at the surface but do not have enough lift capacity to elevate the oral commissures.

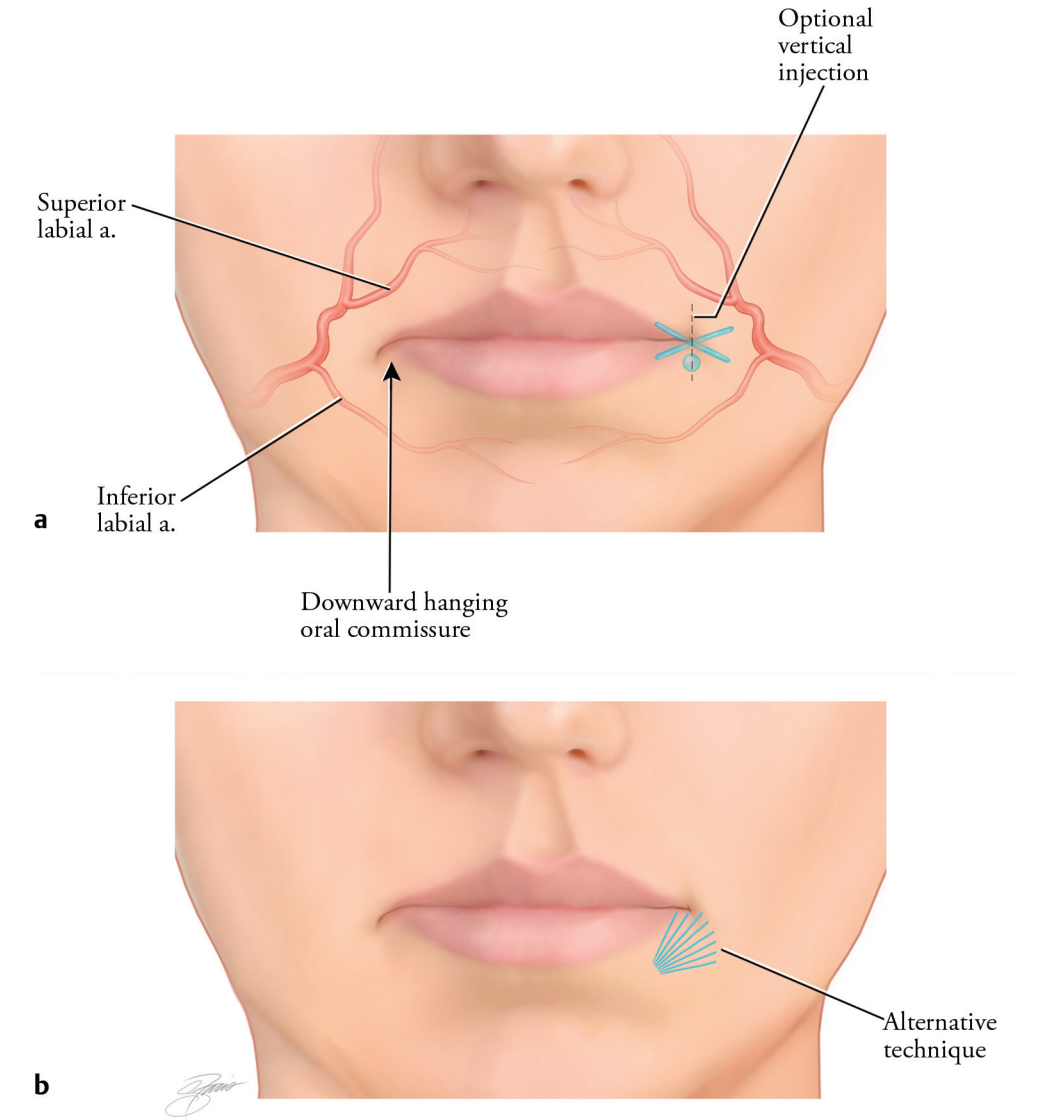


Fig. 43.1 (**a**) The oral commissure can be elevated by injecting in an X-shaped fashion as shown. An optional vertical injection can also be placed. A depot of filler will also act to support the commissure. (**b**) Alternate fanning technique may be used alone or in combination with other procedures described.

Additional Reading

[1] Carruthers A, Carruthers J, Monheit GD, Davis PG, Tardie G. Multicenter, randomized, parallel-group study of the safety and effectiveness of onabotulinumtoxinA and hyaluronic acid dermal fillers (24-mg/mL smooth, cohesive gel) alone and in combination for lower facial rejuvenation. Dermatol Surg. 2010; 36 Suppl 4:2121–2134

[2] Graivier MH, Bass LS, Busso M, Jasin ME, Narins RS, Tzikas TL. Calcium hydroxylapatite (Radiesse) for correction of the mid- and lower face: consensus recommendations. Plast Reconstr Surg. 2007; 120(6) Suppl:55S–66S

[3] Perkins SW. The corner of the mouth lift and management of the oral commissure grooves. Facial Plast Surg Clin North Am. 2007; 15(4):471–476, vii

44
Filler Injection for Vertical Lip Lines

Difficulty: ●●●
Patient Satisfaction: ●●
Risk: ●●

Indications

Perioral wrinkles extend radially from the lips due to the repeated puckering motion from speaking or smoking. In women, lipstick may "bleed" into these lines. In nonsmokers, these lines can be produced in patients who purse their lips while talking.

Anatomic Considerations

The orbicularis oris muscle is the sphincter that surrounds the mouth. Repeated contraction of this muscle may result in circumoral rhytids.

Injection Technique

Because of the risk of visible product ridges under the skin, this is a difficult area to correct with fillers. Only low-concentration hyaluronic acid (HA) fillers and small volumes of product should be used in this area. Restylane Silk and Volbella were developed to treat these fine lines. The initial injection is placed along the vermillion border. Subsequent injections are placed in the skin of the lips; a combination of linear threading and cross-hatching techniques can be used. Injection in the lips is painful. Patients may require topical anesthesia or a dental block.

Precautions

Consider antiviral medication when injecting patients with a history of fever blisters (herpes simplex).

Post-Injection Instructions

Ice as needed.

Risks

Risks include asymmetry, incomplete correction, swelling, and bruising. Some patients experience 2 to 3 days of significant lip edema after treatment with Restylane Silk. Patients should be counseled that fillers and neurotoxins cannot fully eradicate lip lines. Over-injection may produce ridges or a simian-like thickening of the upper lip.

Pearls of Injection

- Do not over-inject this area.
- Massage after injection to minimize lumpiness.
- The concomitant use of neurotoxins in this area can improve results (see also Chapter 17).
- Appropriate filler choices depend upon the thickness of the skin and the depth of the rhytids. For deep upper lip rhytids Restylane is often the product of choice, although Restylane Refyne and Vollure also work nicely in this area. Restylane Silk, Belotero, and Volbella all feel very

soft and can be used close to the upper dermis, though they are not as good for deeper rhytid effacement.

- Perioral lines can be quite resistant to many forms of treatment. Consider laser resurfacing, chemical peel, dermabrasion, or other adjunctive measures to treat stubborn lines.

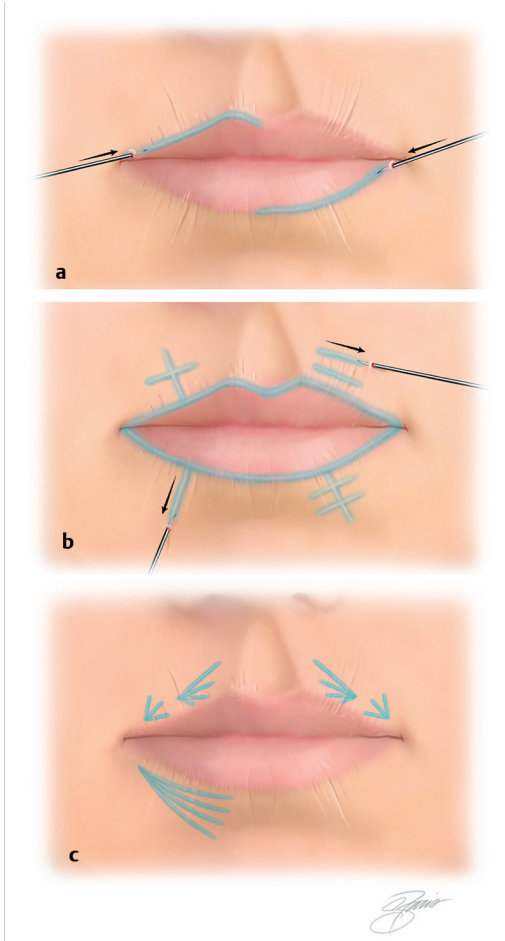


Fig. 44.1 (**a**) The vermillion is treated first, injecting from lateral to medial in an anterograde or retrograde fashion. (**b**) After the vermillion is outlined, the lip lines are treated in a vertical or a cross-hatch fashion and massaged after injection to minimize lumpiness. A combination of these techniques may be required to optimize clinical results. (**c**) Fanning technique should be performed with a thinner filler like Volbella, Refyne, or Restylane Silk.

Additional Reading

[1] Ali MJ, Ende K, Maas CS. Perioral rejuvenation and lip augmentation. Facial Plast Surg Clin North Am. 2007; 15(4):491–500, vii

[2] Barton FE , Jr, Carruthers J, Coleman S, Graivier M. The role of toxins and fillers in perioral rejuvenation. Aesthet Surg J. 2007; 27(6):632–640

[3] Bertucci V, Lynde CB. Current concepts in the use of small-particle hyaluronic acid. Plast Reconstr Surg. 2015; 136(5) Suppl:132S–138S

45
Filler Injection for Glabellar Frown Lines

Difficulty: ●●●
Patient Satisfaction: ●●
Risk: ●●●

Indications

Neurotoxins are commonly used to treat the vertical lines between the brows. Fillers can be used in conjunction with neurotoxins, or as a primary mode if patients are afraid of BoNTA injections. The horizontal lines on the nasal dorsum can be similarly treated.

Anatomic Considerations

The vertical lines of the glabella are produced by contraction of the paired corrugator supercilii muscles, and the horizontal lines are caused by contraction of the centrally located procerus muscle.

Branches of the supraorbital and supratrochlear vessels are located in the glabella. The supratrochlear artery is a distal branch of the ophthalmic artery.

Injection Technique

Topical anesthesia may be used; however, this injection usually can be tolerated without anesthesia. Prior to injecting, have the patient furrow the brow. Filler is placed parallel to the wrinkle with a 30-gauge needle. Filler is placed into the superficial to mid-dermis in a retrograde fashion and massaged to prevent lumpiness. Inject small amounts of HA slowly, and continuously watch for blanching of the forehead, which can indicate a vascular occlusion.

If there is also a concavity below the glabellar furrow, then product can be placed in a depot fashion onto the galea (after a refluxing maneuver) to bring the area up to the correct level.

Precautions

Injection of fillers in this region should be considered with some trepidation. Warnings in the past about collagen injections suggested that arterial embolization and possible skin necrosis could occur with injection in the glabella. Additionally, particles can travel retrograde in the supratrochlear vessels and embolize the ophthalmic artery. Because of the high risk in this area and the potential for lumpiness, hyaluronic acids (HAs) are the product of choice in this region.

Post-Injection Instructions

Ice as needed.

Risks

When treating the vertical lines of the glabella, reflux on the syringe prior to

injecting to minimize the risk of arterial injury, and do not inject deeply in this area. Do not overfill in this area to minimize lumpiness and the risk of vascular compression. However, injection of the horizontal lines over the nasal bridge is much safer and can be injected into the subdermal plane. Massage is also necessary to prevent lumpiness.

Pearls of Injection

- Patients who have persistent glabellar lines after BoNTA treatment may benefit from injection of fillers into the residual creases.
- Patients find that the combination of fillers and neurotoxins in this region produces a longer-lasting result.

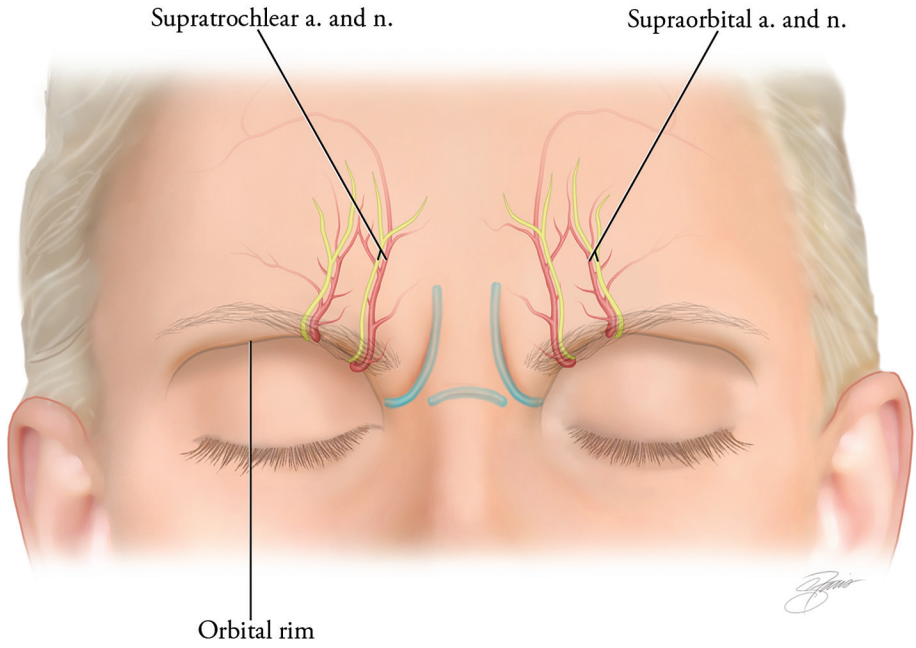


Fig. 45.1 Hyaluronic acid is placed deep to and parallel to the glabellar creases. Stay very superficial in this region so as to avoid injury to the supraorbital and supratrochlear vessels.

Additional Reading

[1] Carruthers J, Carruthers A. Volumizing the glabella and forehead. Dermatol Surg. 2010; 36 Suppl 3:1905–1909

[2] Glaich AS, Cohen JL, Goldberg LH. Injection necrosis of the glabella: protocol for prevention and treatment after use of dermal fillers. Dermatol Surg. 2006; 32(2):276–281

46
Filler Injection for Forehead Wrinkles

Difficulty: ●●
Patient Satisfaction: ●●
Risk: ●●

Indications

Transverse wrinkles of the forehead in patients who have had insufficient response from BoNTA injections, or who are not candidates for BoNTA injection of the forehead.

Anatomic Considerations

Transverse wrinkles of the brow generally respond to neurotoxin injection; however, even with BoNTA some rhytids may not fully improve. Also, some patients are opposed to BoNTA injections. Patients with ptotic brows may not be candidates for BoNTA because the ptosis can be accentuated (and constantly raising a ptotic brow is likely the reason they have rhytids in the first place). In certain cases, the injector may elect to augment deep transverse folds of the forehead with filler.

Injection Technique

Multiple injections are required in this area, so topical anesthetic is recommended. Small depot injections are placed along the line of the wrinkle in the immediate subdermal plane. The filler is marched along the fold along its entire length. After several injections, the product should be massaged to evenly distribute the filler into the wrinkle. Hold firm pressure over areas that bleed.

An alternative technique for injection is retrograde threading, both in the deep dermis with a 30-gauge needle and in the immediate subdermis with a 27-gauge cannula. A thinner product is required the more superficial the plane of injection.

Precautions

Care must be taken to smooth the product well and to place very small amounts directly into the fold to elevate the crease. Inject only the amount of product necessary to improve the wrinkle, or an elevated ridge of product will be seen horizontally across the forehead.

Post-Injection Instructions

None. Ice may be used for bruising.

Risks

Although this is an easy technique, vascular interruption of the subdermal vessels can occasionally occur. If blanching of a wide area is seen during injection, then massage and warm compresses will usually restore the circulation to the region.

Pearls of Injection

- Use a small needle (30- or 32-gauge) and inject only enough filler to elevate the wrinkle.
- Do not over-inject!
- Because of the chance of lumpiness, we prefer hyaluronic acids in this area.
- Combining fillers with BoNTA can also improve results.

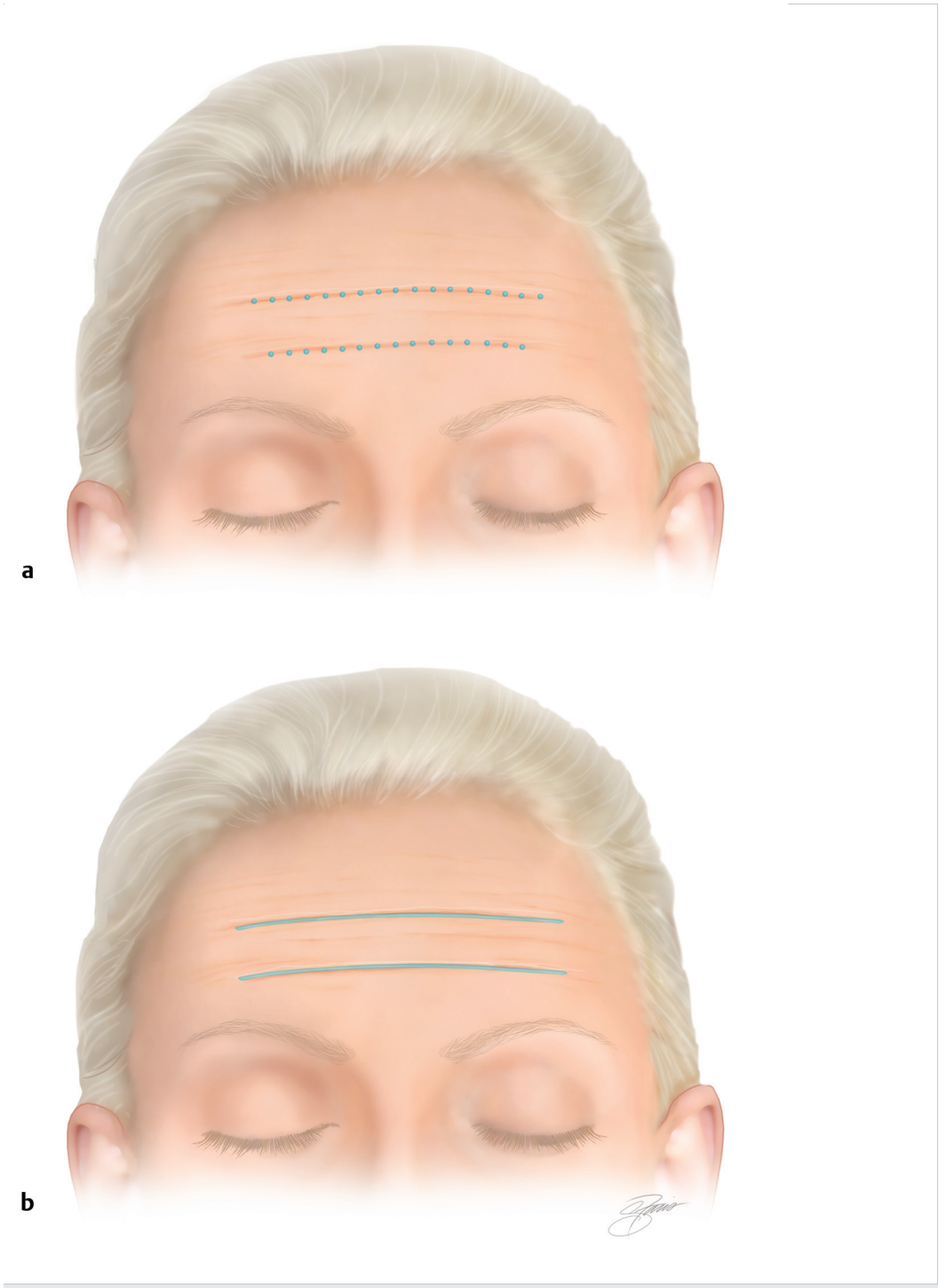


Fig. 46.1 (**a**) Filler is placed like a string of pearls along the forehead crease. The serial puncture (depot) technique is used and the product is smoothed by gentle massage of the treated areas. (**b**) Alternatively, filler can be placed parallel to the crease by linear threading technique.

Additional Reading

[1] Carruthers JDA, Glogau RG, Blitzer A, Facial Aesthetics Consensus Group Faculty. Advances in facial rejuvenation: botulinum toxin type A, hyaluronic acid dermal fillers, and combination therapies–consensus recommendations. Plast Reconstr Surg. 2008; 121(5) Suppl:5S–30S, quiz 31S–36S

[2] Coleman KR, Carruthers J. Combination therapy with BOTOX and fillers: the new rejuvnation paradigm. Dermatol Ther (Heidelb). 2006; 19(3):177–188

[3] Dubina M, Tung R, Bolotin D, et al. Treatment of forehead/glabellar rhytide complex with combination botulinum toxin A and hyaluronic acid versus botulinum toxin A injection alone: a split-face, rater-blinded, randomized control trial. J Cosmet Dermatol. 2013; 12(4):261–266

47
Filler Injection for Tear Trough Deformity

Difficulty: ●●●●
Patient Satisfaction: ●●●
Risk: ●●

Indications

The semicircular depression under the eyes may be filled with hyaluronic acid (HA) fillers to lessen the shadowing in this area. Fillers may be used to delay blepharoplasty surgery in patients with mild fat herniation.

Anatomic Considerations

Classically the tear trough referred to the most medial segment of the under-eye crease; however, with aging the infra-orbital rim becomes more skeletonized, and filler may be placed at the top of the rim along its entirety.

Injection Technique

This is not a painful area to inject, but it is quite unsettling for many patients. Options for anesthesia include topical anesthetic cream, or an infraorbital nerve block using a small amount of lidocaine.

This is one of the most difficult areas to inject well. Ideally a 1-inch (2.5-cm), 30-gauge needle should be used to allow the point of entry to occur below the thin skin of the lower eyelid. Use of a half-inch (1.25 cm) 30-gauge needle is also possible, although this requires pushing the cheek skin upward to reach the highest point on the orbital rim for proper product placement. This inferior entry point will greatly reduce the amount of bruising, as most of the blood vessels are in the orbicularis muscle. The needle is then passed upward at an angle until it comes to rest at the top of the orbital rim, where the finger of the opposite hand is positioned so as to direct the needle, confirm the location, and protect the contents of the orbit. Injection should not proceed until the tip of the needle has been placed against the bone and its precise location has been verified.

Inject very slowly and deeply onto the bone. It is very important that the product be precisely placed at the highest point along the upper edge of the maxilla at the top of the infraorbital rim. If due to hesitation or fear the injection is placed lower, then one runs the risk of creating a deeper trough by augmenting the cheek while neglecting the deep valley. Massage the product as it is injected in small 0.1- to 0.2-mL depot boluses to fill in the depressed areas. The patient should be placed in a sitting position. Have the patient vary the eye position, as this may accentuate bulges and depressions and aid in evaluating for symmetry.

Precautions

Inject deeply onto the orbital rim periosteum. Superficial injections will increase bruising and increase the risk of the Tyndall effect.

Post-Injection Instructions

Firm pressure over the injection sites and ice are necessary. Bruising is possible but less common when injected as described above. If injected through the thin skin or superficially, then bruising will be very common. Lumpiness and unevenness of the lower lid should not be seen if the injection has been done properly, unless a hematoma occurs. If it persists for more than 2 weeks, have the patient place a warm compress over the lid for 20 minutes while applying firm pressure. This can help flatten lumps and improve minor irregularities.

Risks

Although there are no serious risks to injecting the tear trough, the greatest risk of injection is an unsatisfactory result. Particularly with the HAs, the Tyndall effect can be seen even if the HA is deposited deeply. Hyperpigmentation can be seen in patients who complain of a "bruise" lasting more that 2 to 3 weeks. This post-inflammatory hyperpigmentation may require hydroquinone to improve. The HA can occasionally increase fluid retention in the entire periocular area in certain patients and lead to prolonged swelling in the malar area or a delayed bluish color in the medial orbicularis muscle. If this occurs, hyaluronidase injections into the subcutaneous tissue can often disperse the swelling and discoloration. If the injection is placed too inferiorly at the mid-pupillary line, there is a risk of injuring the infraorbital nerve and intravascular injection into the foramen vessels.

Pearls of Injection

- It is not uncommon for patients to become vasovagal with cosmetic injections, but this is particularly seen with tear trough injections. Patients are often quite anxious about being injected in this area. They also complain of an unsettling feeling when the lower lid becomes numb. At the completion of the procedure, ensure that the patient does not feel lightheaded upon standing.
- Hyaluronic acids are the products of choice in this area. The uniform particle size and lower HA concentration of Belotero, Restylane Silk, and Volbella allow for more superficial injections and less chance of the Tyndall effect.
- Twitching of the eyelid muscles can be seen occasionally due to the lidocaine, and will resolve spontaneously.
- For optimal results, the injector should proceed slowly and only inject 1 mL of product at a time. It helps to have the patient return 2 weeks after the initial injection for a re-treatment, if necessary.
- Patient education is key for this procedure. The patients must be patient with the process until the final result is achieved.

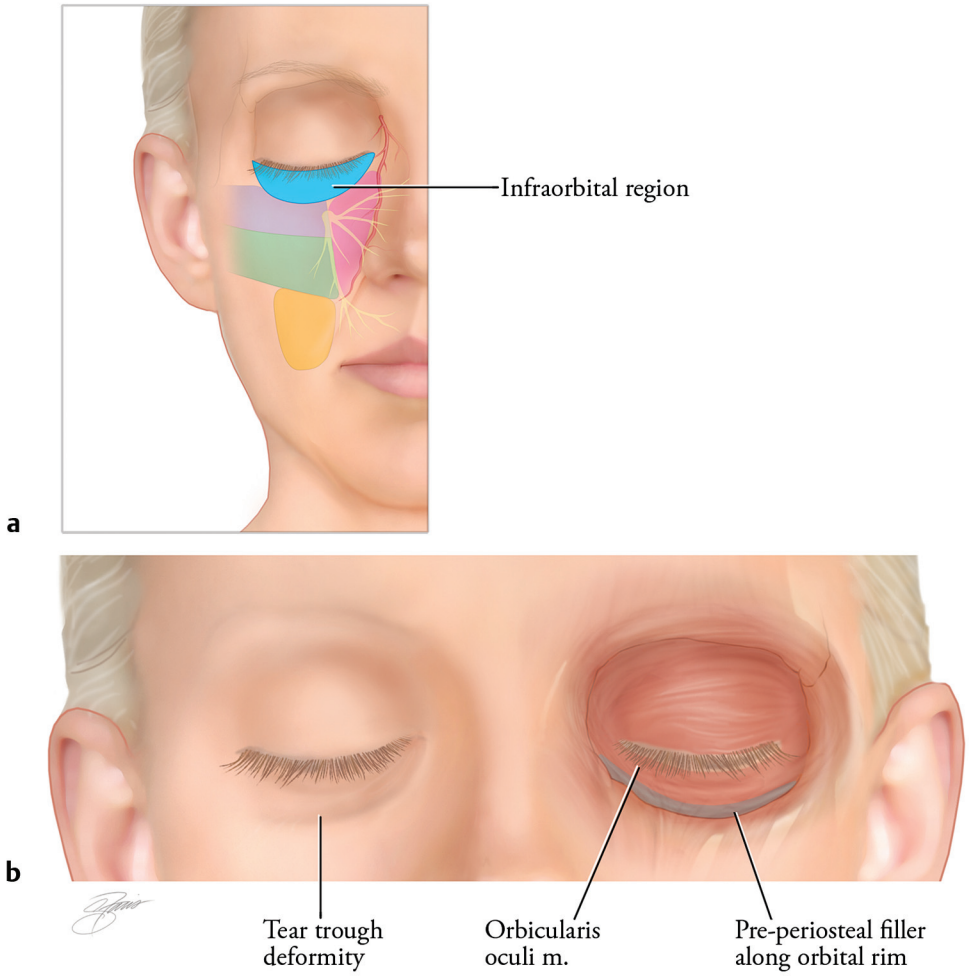


Fig. 47.1 (**a**) The intraorbital region of the midface. (**b**) Filler is placed along the infraorbital rim periosteum to improve inferior orbital hollowing. If necessary, filler can be placed subcutaneously, but this technique runs the risk of the Tyndall effect with some products.

Additional Reading

[1] Andre P. New trends in face rejuvenation by hyaluronic acid injections. J Cosmet Dermatol. 2008; 7(4):251–258

[2] Donath AS, Glasgold RA, Meier J, Glasgold MJ. Quantitative evaluation of volume augmentation in the tear trough with a hyaluronic acid-based filler: a three-dimensional analysis. Plast Reconstr Surg. 2010; 125(5):1515–1522

[3] Lee S, Yen MT. Nonsurgical rejuvenation of the eyelids with hyaluronic acid gel injections. Semin Plast Surg. 2017; 31 (1):17–21

[4] Morley AM, Malhotra R. Use of hyaluronic acid filler for tear-trough rejuvenation as an alternative to lower eyelid surgery. Ophthal Plast Reconstr Surg. 2011; 27(2):69–73

48
Filler Injection for Sunken Upper Eyelids

Difficulty: ●●●●
Patient Satisfaction: ●●●
Risk: ●●●

Indications

The hollow or sunken upper eyelid can be unattractive and an aging sign on the face. Genetics, aging, illness, and overly aggressive surgical fat resection can all contribute to a skeletonized, bony appearance of the medial third to half of the superior orbital rim as it blends into the nasal bridge. Restoring the look of lost soft tissue fullness in this area can greatly improve the youthful aesthetic of a hollow orbit.

Anatomic Considerations

The upper lid skin is usually quite thin in most individuals; there are sensory nerves of the supraorbital and supratrochlear nerve branches, as well as vascular bundles to avoid during the injection of this area. This is an area that requires advanced knowledge and experience; it should be approached only by the confident injector who is experienced and comfortable with the pertinent anatomy and the management of all aspects of complicated filler patient care.

Injection Technique

We prefer hyaluronic acid (HA) for these injections. The best injection plane is directly onto the periosteum on the lower to inferior aspect of the superior orbital rim. Whether performed as a series of depot pearl-like injections massaged together or with a long retrograde injection, the goal is to coat the bone with a uniform layer of product so as to cushion and fill the space between the bone and the skin/muscle complex. The area is most safely approached from a lateral to medial direction, keeping the injections lateral to the medial aspect of the brow. The safest technique is to use a 30- to 32-gauge, half-inch (1.25 cm) to 1-inch (2.5 cm) needle; place the tip of the needle firmly on the bone and perform retrograde injections. Careful observation will reveal where extra sculpting is necessary to augment the deepest concavities of the upper eyelid complex and improve the upper lid contour. This is one area where use of a cannula may be the best choice for product placement and avoidance of vascular injury.

Precautions

Injecting higher along the face of the frontal bone away from the free edge of the orbit will create two potential problems. The first would be a risk of injury to or injection into one of the neurovascular bundles as it exits the bone or orbit. The second possible problem would be the potential for creating the appearance of frontal bossing if filler is placed along the bone rather than in the orbital hollow.

Post-Injection Instructions

Immediate pressure and then ice are helpful to minimize bruises. The eyelid will swell and may need to be iced for several days.

Risks

Risks for swelling and bruising are real, but the catastrophic intravascular, periocular accidents that could arise are enough to deter most novice and even experienced injectors from trying this new area of volumetric correction.

Pearls of Injection

- Keep the injection volume low at first. Inject from the lateral toward the medial upper eyelid, staying low and keeping the needle moving while introducing product. Often there is not a true foramen for the supraorbital nerve, so it can be expected to exit from the orbit and course superiorly over the bony rim.
- Consider dilution of the HA with Xylocaine.
- Consider using a cannula technique when treating this region.

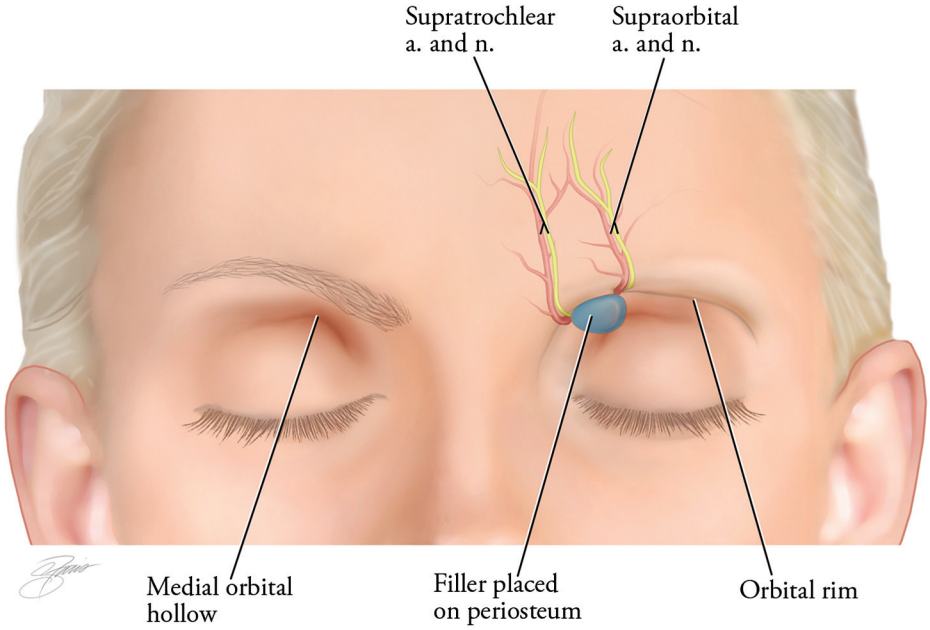


Fig. 48.1 Filler is placed along the superior orbital rim periosteum to camouflage a supraorbital hollow. Care should be taken to avoid injury to the supraorbital and supratrochlear neurovascular bundles.

Additional Reading

[1] Lambros V. Volumizing the brow with hyaluronic acid fillers. Aesthet Surg J. 2009; 29(3):174–179

[2] Morley AM, Taban M, Malhotra R, Goldberg RA. Use of hyaluronic Acid gel for upper eyelid filling and contouring. Ophthal Plast Reconstr Surg. 2009; 25(6):440–444

[3] Romeo F. Upper eyelid filling with or without surgical treatment. Aesthetic Plast Surg. 2016; 40(2):223–235

49
Filler Injection for Lateral Brow Lift

Difficulty: ●●●
Patient Satisfaction: ●●
Risk: ●

Indications

The brow becomes ptotic or droopy because of volume loss between the skin and the bone, with hollowing of the temple and skeletonization of the lateral orbital rim. As a result, the position of the brow hairs can be much lower than desired, and the overall position of the brow can cause a sad or even stern appearance. When placed properly, fillers can be used to restore fullness, volume, and actual lift to a flat or bony brow.

Anatomic Considerations

The skin is usually thin in individuals who are candidates for lateral browlift with volumetric filling, and there may be a great deal of superficial vascularity. Typically, there is a single perforating sentinel vein just superolateral to the orbital rim that is perpendicular to the surface of the skin, whereas all the other vessels spread out parallel with the surface and can be avoided with deep injection.

Injection Technique

The best injection plane is deep to the orbicularis and the aponeurotic fascia and galea, but just above the periosteum. It is often easiest if this plane is first entered with a 30-gauge needle and some local anesthetic (1% lidocaine with 1:100,000 epinephrine buffered with sodium bicarbonate 1:9). When the patient is numb, the product is inserted via a long needle (1.0- to 1.5-inch/2.5- to 3.8-cm needle) under the deep, tight, thicker fascia just above the periosteum. Once the needle is in place above the bone but below the level of the brow hairs, the injector will not be able to lift the needle vertically away from the bone. A retrograde injection can then occur as the needle is withdrawn slowly. A second or third pass directed at a slightly different angle could help build a mound or roll of fullness in the area of the lateral brow.

Alternate Technique

Filler is layered on the periosteum and also in the subdermal tissue until adequate elevation of the brow is achieved. Massage into place after injection, and confirm bilateral brow symmetry.

Precautions

Do not over-inject this area. Be careful to maintain symmetry.

Post-Injection Instructions

Immediate pressure and then ice are helpful to minimize bruises. The brow will swell and may need to be blended out laterally to the temple or the lateral orbit to achieve a natural look.

Risks

Minimal risks occur besides bruising using the superficial technique, so long as the injections are smooth and even.

Pearls of Injection

- Keep the injection at the tail of the brow at or under the brow hairs initially to make the best use of the product and get the most lift. Also, keeping the volume at or below the level of the brow will keep the brow lifting rather than potentially making the brow appear heavier.
- Hyaluronic acid or calcium hydroxylapatite may be used in this region.
- Consider treatment of the lateral orbicularis muscle with BoNTA (see also Chapter 10).

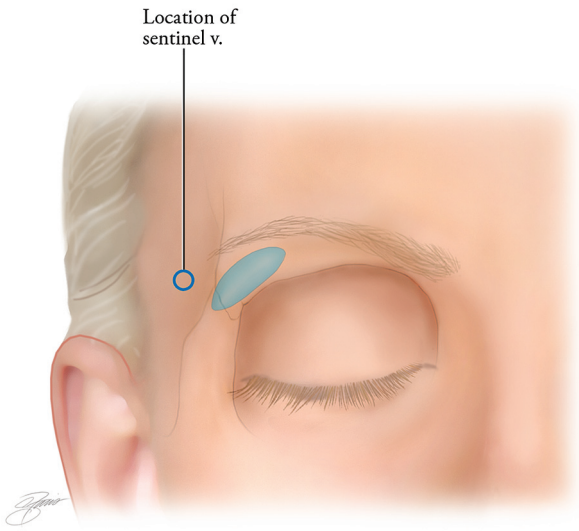


Fig. 49.1 Filler is placed along the periosteum of the lateral orbital rim to produce a lateral brow lift.

Additional Reading

[1] Carruthers JD, Carruthers A. Facial sculpting and tissue augmentation. Dermatol Surg. 2005; 31(11 Pt 2):1604–1612

[2] Moradi A, Watson J. Current concepts in filler injection. Facial Plast Surg Clin North Am. 2015; 23(4):489–494

50
Filler Injection for Sunken Temples

Difficulty: ●●
Patient Satisfaction: ●●●
Risk: ●●

Indications

Hollowing of the temporal fossa can lead to a sunken or gaunt look that ages the upper half of the face. Though fat loss can occur from trauma or disease states, the most common cause is natural aging. Other causes include surgical deformities, HIV-associated lipoatrophy, or thin patients with little body fat.

Anatomic Considerations

The anatomic boundaries of the temple are the temporal line superiorly, the tail of the brow and lateral orbital rim medially, the hairline posteriorly, and the zygomatic arch inferiorly. Several large veins and arteries run superficially in this region. The temporalis muscle fills the temporal fossa. Injections are placed through the muscle, down to the periosteum of the temporal fossa.

Injection Technique

Hyaluronic Acid

The superior and medial aspects of the temporal area provide the most benefit aesthetically, and should be filled first. Injection of hyaluronic acid (HA) requires use of a 1-inch (2.5-cm) needle to inject deep onto the periosteum in the upper half of the fossa and then deep onto or below the temporalis fascia more inferiorly. Depot injections must be used in this region to minimize contour irregularities. Placing the product deep and then massaging it into place will ensure uniform volumization of the temporal fossa. It would not be unusual to use 1 mL of product in each temple in moderately to severely sunken temples.

Calcium Hydroxylapatite

Calcium hydroxylapatite (CaHA) may be injected into the temporal fossa to give a firmer feel to the temples. The injection technique is similar to that used for HAs.

Poly-L-Lactic Acid

The depot technique similarly is used, laying product onto the periosteum. A 25-gauge needle of at least 1.0 to 1.5 inches (2.5 to 3.8 cm) in length is preferable to ensure deep placement. To evenly spread the product, massage is performed by the injector just after placement and by the patient for 5 days posttreatment (for 5 minutes, 5 times a day). With a 6- to 8-mL dilution of poly-L-lactic acid (PLLA), 1 to 2 mL of product is administered to each temporal fossa, depending on the amount of atrophy. Two or three treatment sessions may be required. An interval of 4 to 8 weeks between injections is recommended, and increased improvement

continues for 3 to 6 months after the final injection.

Precautions

There are many surface vessels in the temple, and care should be taken to perform depot injections between or below them. If a vessel is traumatized, firm pressure for several minutes will minimize bruising.

Post-Injection Instructions

Massage is helpful for the HA patients, and mandatory for the PLLA patients. Cold compresses can help prevent both soreness of the temporalis muscle and discomfort while chewing.

Risks

Bruising is possible; apply firm pressure should a vessel be violated. Filling too close to the surface can result in an uneven or lumpy appearance. Trismus may be noted in some patients for 1 to 2 days posttreatment and will resolve without treatment.

Pearls of Injection

- The end point of treatment usually occurs when the area is still slightly concave to flat but not overcorrected to bordering on convex. Proper depth of placement is the key to smooth results.
- It is difficult to overfill this area. It is valuable to look at both sides of the patient to compare after completing the first side. Show the patient the difference in the two sides, as it is often dramatic; this will give the patient an idea of the treatment end point as well.
- Because of the high vascularity in this region, it is often helpful to perform a reflux maneuver on the syringe before injecting the product to prevent intravascular injection.
- Some patients will notice an elevation of the lateral brow with improvement of the temporal hollowing.

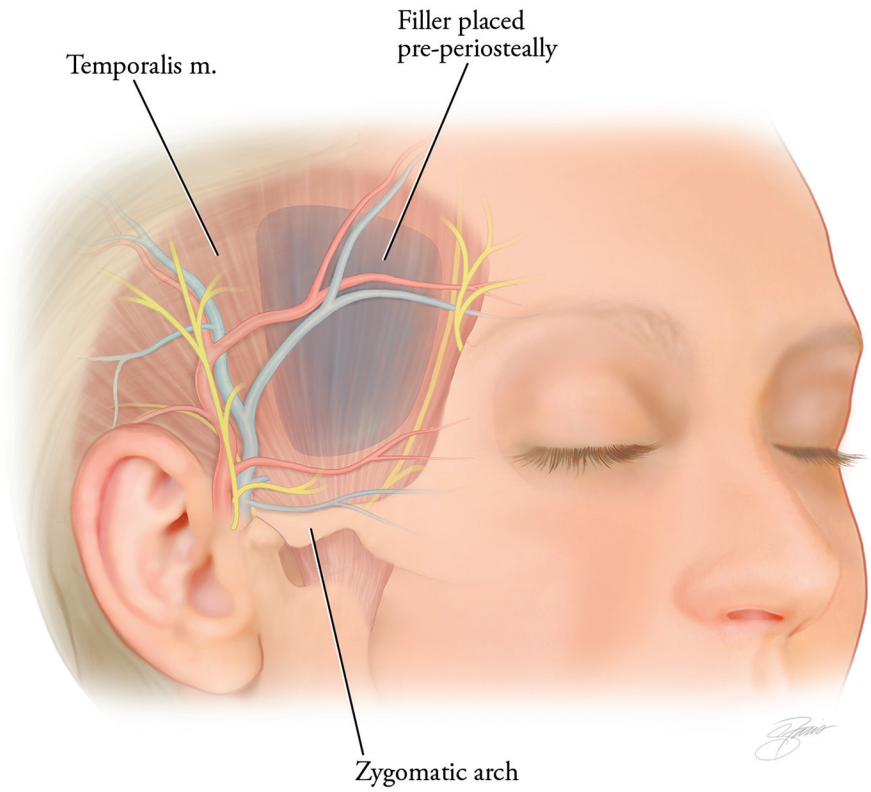


Fig. 50.1 Filler is placed deep to the temporalis muscle onto the periosteum to volumize the temples. Care is taken to avoid injury to the numerous vessels in this region.

Additional Reading

[1] Fitzgerald R, Vleggaar D. Facial volume restoration of the aging face with poly-L-lactic acid. Dermatol Ther (Heidelb). 2011; 24(1):2–27

[2] Lambros V. A technique for filling the temples with highly diluted hyaluronic acid: the "dilution solution". Aesthet Surg J. 2011; 31(1):89–94

[3] Rose AE, Day D. Esthetic rejuvenation of the temple. Clin Plast Surg. 2013; 40(1):77–89

[4] Ross JJ, Malhotra R. Orbitofacial rejuvenation of temple hollowing with Perlane injectable filler. Aesthet Surg J. 2010; 30 (3):428–433

51
Filler Injection for Nonsurgical Rhinoplasty

Difficulty: ●●●●
Patient Satisfaction: ●●●
Risk: ●●

Indications

Because the nose occupies the center of the face, even mild asymmetries can be quite striking. Rhinoplasty surgery is not always a perfect procedure, and postsurgical defects can be difficult to correct. As a result, the use of fillers in small quantities to treat specific nasal deformities has become a way to fine-tune postsurgical noses. In addition, in some patients who refuse surgery or who are not surgical candidates, a nonsurgical approach to their nasal concerns may be possible by the use of filling agents.

Anatomic Considerations

Knowledge of the ideal proportions of an attractive nose will be necessary as well as knowledge of the basic anatomy of the bony, cartilaginous, and soft tissue structures involved. It is also important from a safety standpoint to be aware of the key vascular channels to avoid intravascular injections.

Injection Technique

When injecting a hollow or void in the nose, it is best to start deep on the bone or cartilage and perform a retrograde injection with a threading movement so as to avoid a direct depot injection that could possibly flow into a blood vessel.

Dorsal Hump

To straighten a dorsal hump, inject both above and below it as needed to straighten the dorsal profile. This technique can also be used on a wide nose to give the illusion of a higher and narrower nasal profile.

Saddle Nose Deformity

In these cases, there is little to no supporting cartilage at the base of the concavity. Therefore it is necessary to inject into the immediate dermal/subdermal plane to thicken the skin layer, allowing improved bridging from the bony dorsum to the cartilaginous tip. Secondary injection to the deeper plane below will help to further support and elevate the concave area and augment the bridge contour.

Twisted/Crooked Nose

When dealing with the twisted nose, it is possible to imagine a single line that passes through the midline. Usually there are portions of the twisted nose that will wind in a C or S shape onto either side of the midline. By filling the concavities the nose will appear straighter.

Drooping Tip

When there is little tip definition and a droopy tip, a new, more rotated and defined tip can be "created" by placing filler depot injections into appropriate anatomic locations. The injections can mimic a tip graft that will augment and better define the tip, and can also increase the tip projection and increase tip rotation. The thickness of the skin and the amount of scar tissue in the area will determine whether and to what extent this technique will be successful.

Precautions

Often, if there are large pores in the area being injected, the needle may need to be passed at a deeper or different angle if product begins to extrude through one of the dilated pore tracts. Over-injection of a given area can lead to blanching or even intravascular occlusion. Restylane is the preferred hyaluronic acid (HA) for the nose, because the hydrophilic nature of Juvéderm accentuates edema in this region. Calcium hydroxylapatite (CaHA) may be used, although, because of its permanence, the injector should proceed with extreme caution.

Post-Injection Instructions

Ice and pressure are helpful to prevent bruising. The product will swell some with an HA and feel firmer to palpation the first week and then blend in more naturally. The patient should expect that the areas injected will look raised and welted at first. Swelling should improve within about 2 to 4 days.

Risks

Nasal injections must be placed in an avascular plane, either preperiosteal or pre-perichondral. Care should be taken not to inject into the dermis to avoid the dermal vascular plexus.

The most significant risks involve injection into a vessel that could lead to vascular necrosis. Retrograde injections and avoiding high pressure on, or blanching of, the skin during treatments can help prevent this devastating complication. Because of the high risk of vascular compromise in these areas, consider using only HAs in this region.

Pearls of Injection

- Undercorrection is recommended in this region.
- Keep the needle in motion so as not to inject into a vessel and create an occlusion or embolic situation.
- Proceed with caution in post-rhinoplasty patients because prior surgery may compromise the blood supply to the nasal skin, which may increase the chance of skin necrosis.
- Always perform a reflux maneuver before injecting.

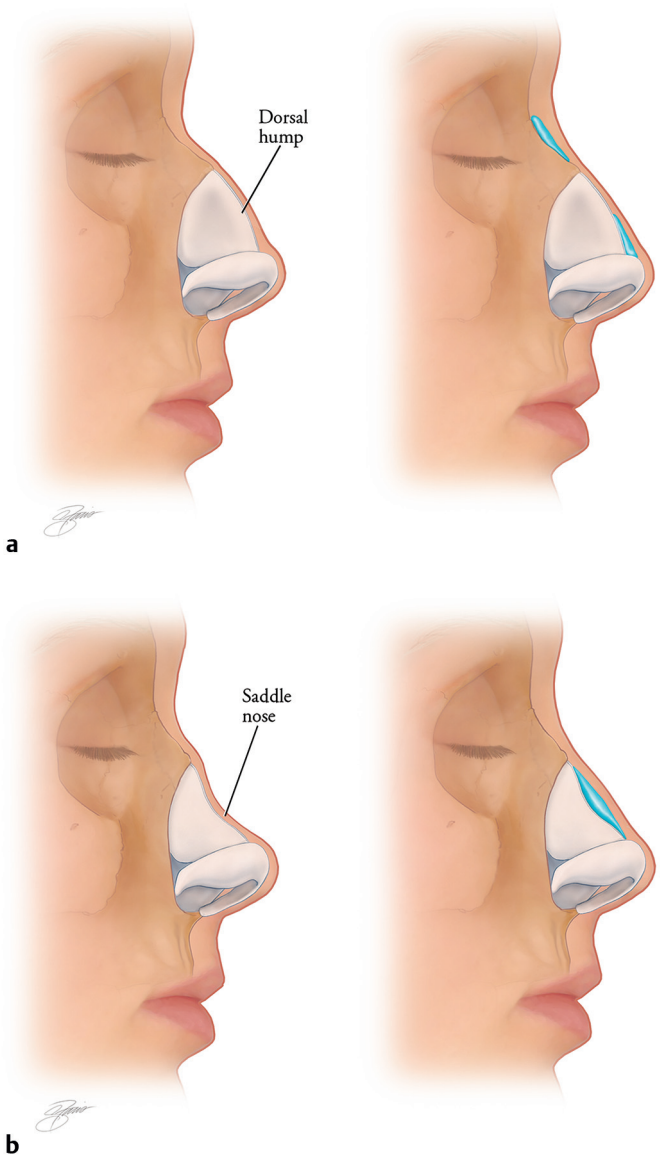
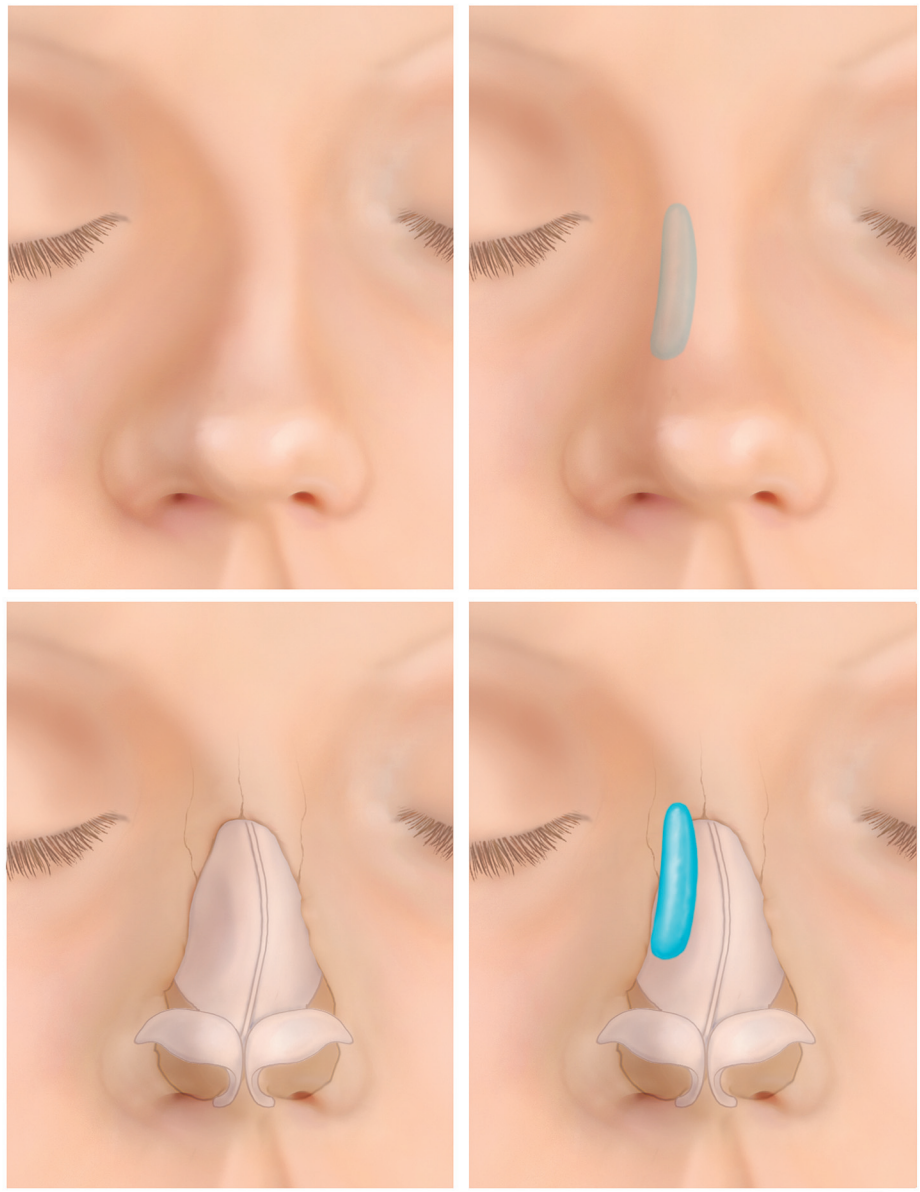


Fig. 51.1 Fillers for nonsurgical rhinoplasty. (**a**) Dorsal hump. Filler can be placed above and below a dorsal hump to straighten the dorsal profile. (**b**) Saddle nose. The concavity of the dorsum seen in the saddle nose deformity can be improved nonsurgically by using filler.



c

Fig. 51.1 (*Continued*) (**c**) Crooked nose. Filler is placed along the periosteum or perichondrium in the concave aspect of the nasal sidewall to give the illusion of a straight dorsum. Pre- (left upper and lower panels) and post- (right upper and lower panels) injections along the right nasal sidewall improve a mildly crooked nose in a patient with a persistent deformity after closed reduction of a nasal fracture.

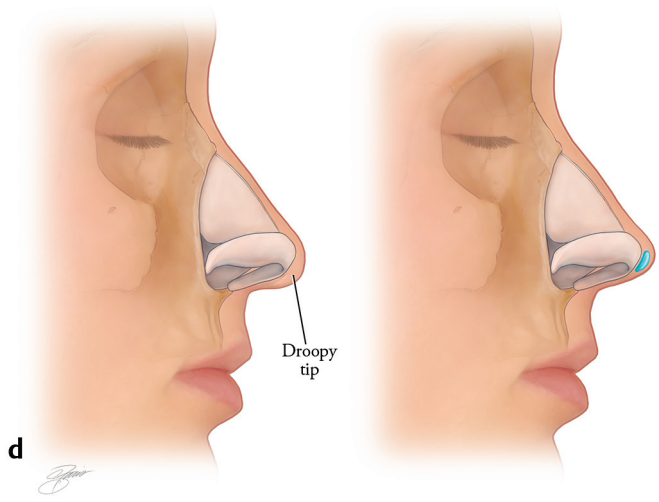


Fig. 51.1 (*Continued*) (**d**) Droopy tip. Filler can be used as a "tip graft" to define and elevate a ptotic tip.

Fig. 51.2 (**a**) Dorsal hump with deep radix. (**b**) Improvement of nasal dorsum immediately post injection by placing filler as shown in ▶ Fig. 51.1a.

Additional Reading

[1] Humphrey CD, Arkins JP, Dayan SH. Soft tissue fillers in the nose. Aesthet Surg J. 2009; 29(6):477–484
[2] Kontis TC. Nonsurgical rhinoplasty. JAMA Facial Plast Surg. 2017; 19(5):430–431–; [Epub ahead of print]
[3] Kontis TC. The art of camouflage: when can a revision rhinoplasty be nonsurgical? Facial Plast Surg. 2018; 34(3):270–277
[4] Redaelli A. Medical rhinoplasty with hyaluronic acid and botulinum toxin A: a very simple and quite effective technique. J Cosmet Dermatol. 2008; 7(3):210–220
[5] Wang LL, Friedman O. Update on injectables in the nose. Curr Opin Otolaryngol Head Neck Surg. 2017; 25(4):307–313

52
Filler Injection for Nasal Valve Stenting

Difficulty: ●●●●
Patient Satisfaction: ●●
Risk: ●

Indications

Collapse of the internal and external nasal valves is generally treated surgically. In patients who have not had adequate improvement after surgery, or those who refuse surgery, filler can be used to stent the valve and prevent collapse with inspiration. Filler material can be used similar to how cartilage grafting is used in the nose.

Anatomic Considerations

The internal nasal valve is the acute angle formed by the junction of the septum and the lateral crus of the lower lateral cartilage. The external nasal valve refers to the area created by the ala, columella, and nasal floor.

Injection Technique

Topical anesthetics or intranasal 4% Xylocaine is adequate anesthesia for this procedure. Avoid using injected local anesthesia as it will change the shape of the valve and negate the filler effect.

Internal Nasal Valve

Very small amounts of filler are deposited intranasally in the area of the lateral crus or scroll region until the patient notices improvement in the airway. Before injection, ask the patient to rate the nasal patency on a scale of 1 to 10. Inject a small amount of filler, and ask the patient to rate the airway patency again. Inject until the nasal patency is acceptable.

External Nasal Valve

Very small amounts of filler are placed along the alar rim until there is improvement of collapse during deep inspiration.

Precautions

Lumpiness may be seen externally if over-injected.

Post-Injection Instructions

None. Bruising is unlikely.

Risks

Over-injection can weigh down the ala and worsen collapse.

Pearls of Injection

- Optimal results are obtained with thicker fillers like calcium hydroxylapatite or more concentrated hyaluronic acid fillers. The advantage of HA fillers is that they can be reversed with hyaluronidase in case of intravascular injection, over-injection, or blanching.

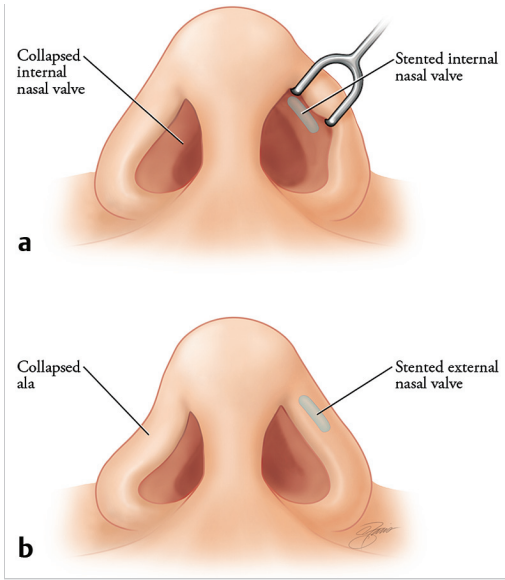


Fig. 52.1 (**a**) Filler is injected intranasally at the scroll region to stiffen the internal nasal valve. (**b**) Filler can be used to strengthen a collapsed ala and improve the external nasal valve.

Additional Reading

[1] Nyte CP. Hyaluronic acid spreader-graft injection for internal nasal valve collapse. Ear Nose Throat J. 2007; 86(5):272–273

[2] Nyte CP. Spreader graft injection with calcium hydroxylapatite: a nonsurgical technique for internal nasal valve collapse. Laryngoscope. 2006; 116(7):1291–1292

53
Filler Injection for Medial Midface Hollowing

Difficulty: ●●●
Patient Satisfaction: ●●●
Risk: ●●

Indications

Facial aging is a complex combination of volume loss and tissue ptosis. However, midface hollowing can be seen with facial aging or occasionally in younger individuals who present with an anatomically flattened midface.

Anatomic Considerations

The medial midface is the triangular zone below the infraorbital rim, lateral to the nasal sidewall and medial to the infraorbital foramen adjacent to the submalar region.

Injection Technique

Hyaluronic acid (HA) or calcium hydroxylapatite (CaHA) may be injected into this area for facial volume restoration. Injection may be placed deeply onto the periosteum or more superficially in the superficial subcutaneous tissue. A fanning technique can ensure even placement of the product. Massage after placement helps to evenly distribute product and allows the injector to palpate any areas that were not fully injected.

Precautions

Bruising is common in this area. The angular artery runs lateral to the nose, and care must be taken not to injure this vessel, either by compression or by embolization. Avoid injecting into the infraorbital nerve foramen.

Ask the patient to refrain from applying heavy pressure on the injected cheeks (either from ice after treatment or from pressure from sleeping) to prevent flattening the revolumized areas.

Post-Injection Instructions

Ice and pressure are helpful to prevent bruising. The product will swell some with HA or CaHA and feel firmer to palpation the first week and then blend in more naturally.

Risks

There are minimal risks of injection in this area. The most difficult aspect of injection here is ensuring symmetry.

Pearls of Injection

- To reduce the risk of vascular injury, consider the use of cannulas in this region when performing deep injections. Fine-tuning of the injection in a more superficial plane may require the use of needles.

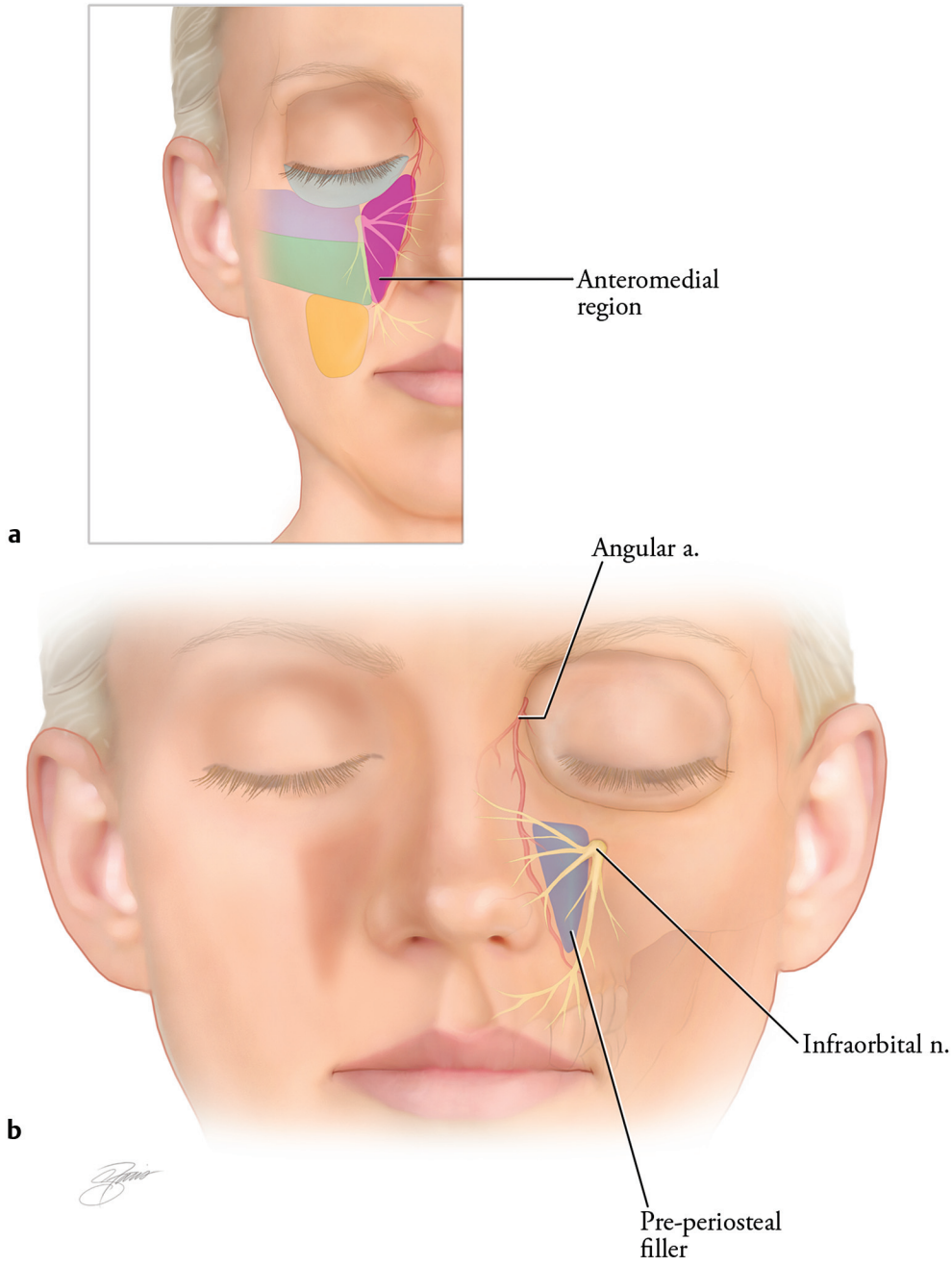


Fig. 53.1 (**a**) Anteromedial subdivision of the midface lies medial to the infraorbital nerve, lateral to the angular artery, and inferior to the infraorbital rim. (**b**) Filler may be placed along the periosteum and massaged into place to improve a flattened midface.

Additional Reading

[1] Few J, Cox SE, Paradkar-Mitragotri D, Murphy DKA. A multicenter, single-blind randomized, controlled study of a volumizing hyaluronic acid filler for midface volume deficit: patient-reported outcomes at 2 years. Aesthet Surg J. 2015; 35 (5):589–599

[2] Funt DK. Avoiding malar edema during midface/cheek augmentation with dermal fillers. J Clin Aesthet Dermatol. 2011; 4(12):32–36

[3] Raspaldo H. Volumizing effect of a new hyaluronic acid subdermal facial filler: a retrospective analysis based on 102 cases. J Cosmet Laser Ther. 2008; 10(3):134–142

[4] Tansavatdi K, Mangat DS. Calcium hydroxyapatite fillers. Facial Plast Surg. 2011; 27(6):510–516

54
Filler Injection for Cheekbone Augmentation

Difficulty: ●●
Patient Satisfaction: ●●●
Risk: ●●

Indications

Fillers may be used to augment the cheekbones, or lateral malar prominence. (Alternatively, permanent malar implants may be inserted surgically, or fat augmentation can be performed.)

Anatomic Considerations

The malar bone and overlying soft tissue form the lateral malar prominence. High cheekbones contribute to a youthful arc seen in three-quarter view. Some patients with aging of the midface display a fat pad of the lateral malar prominence, referred to as the "malar mound." This triangular prominence results from the orbital retaining and zygomaticocutaneous ligaments.

Injection Technique

Topical anesthesia may be used for this procedure. Fillers with lidocaine may be placed deeply at first injection to anesthetize the infraorbital nerve. Dental blocks are discouraged and may actually distort the anatomy. To volumize the lateral malar prominence, fillers may be placed through the intraoral or percutaneous route. Intraoral injection does not predispose the patient to infection. Filler can be placed deep in the subcutaneous tissue and pre-periosteal planes.

To camouflage the malar mound, hyaluronic acid (HA) fillers can be placed more superficially (deep dermal or subcutaneous) over the retaining ligaments. In addition, deep injection over the malar prominence will also camouflage the malar mound and elevate the lateral cheek.

Precautions

As this is a very safe injection location, HA or calcium hydroxylapatite (CaHA) may be used. Avoid injection into the malar mound fat because this might increase edema of the fat pad.

Post-Injection Instructions

Ice may be used as needed, but instruct the patient not to press firmly on the injected site or to sleep on that side for a few days to minimize flattening of the product.

Risks

Bruising is possible. The greatest challenge with performing this procedure is ensuring symmetry.

Pearls of Injection

- Lateral malar augmentation may be performed through a single-entry point on each cheek. Cannulas may be used for the deep injections.

- Injections that are placed too inferior or medial, as well as over-injection of this area, can create an unnatural look in many patients.
- Preexisting asymmetry is the rule in most patients, and achieving a symmetrical final outcome should be the goal.

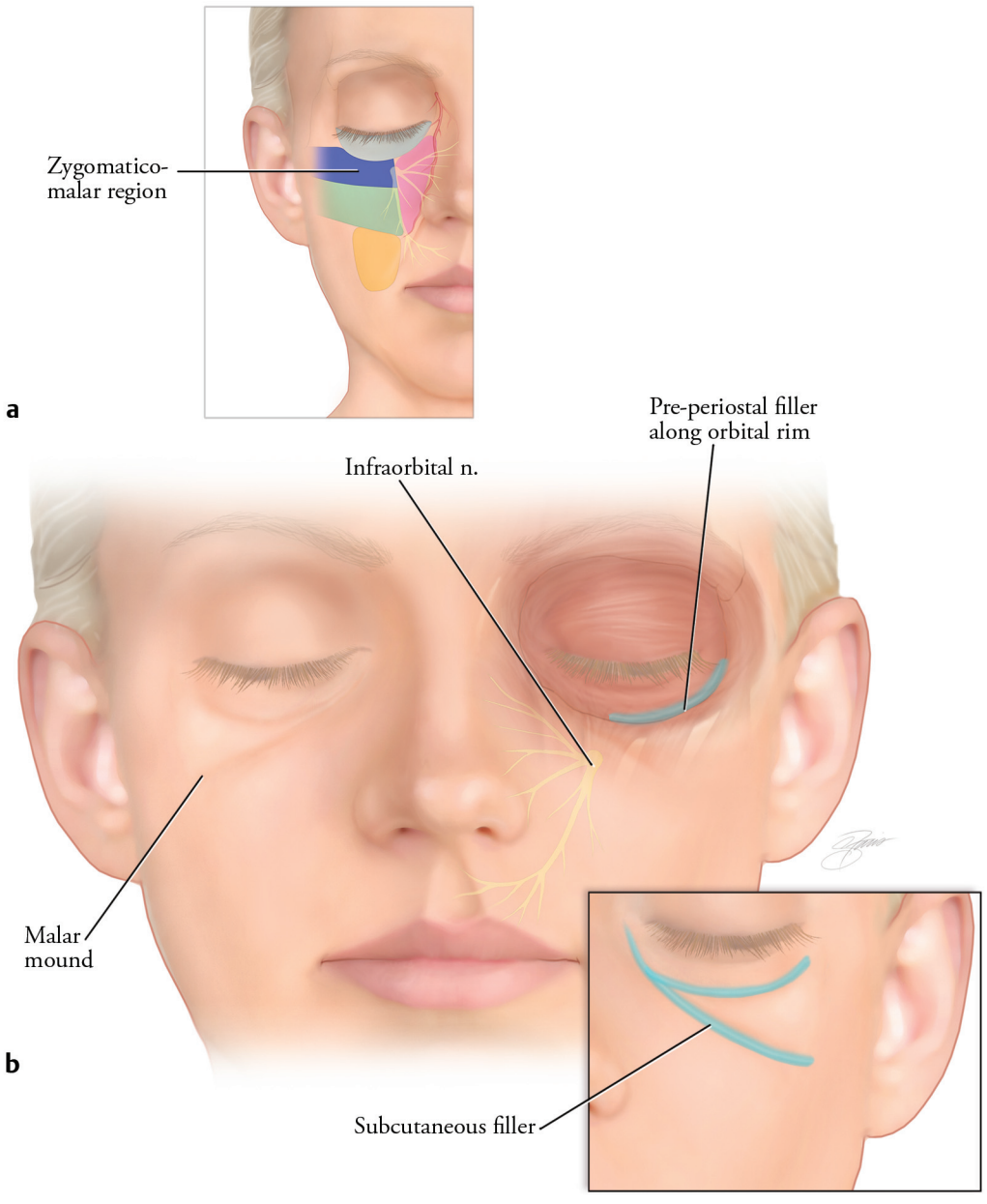


Fig. 54.1 (**a**) The zygomaticomalar subdivision of the midface lies inferior to the infraorbital rim and lateral to the infraorbital nerve. (**b**) The prominence of the cheekbones is improved by augmenting the zygomaticomalar region. Injection may include deep injection along the infraorbital rim and zygomatic arch as well as a more superficial injection to camouflage the malar mound.

Additional Reading

[1] Carruthers JD, Carruthers A. Facial sculpting and tissue augmentation. Dermatol Surg. 2005; 31(11 Pt 2):1604–1612
[2] Few J, Cox SE, Paradkar-Mitragotri D, Murphy DKA. A multicenter, single-blind randomized, controlled study of a volumizing hyaluronic acid filler for midface volume deficit: patient-reported outcomes at 2 years. Aesthet Surg J. 2015; 35(5):589–599
[3] Lowe NJ, Grover R. Injectable hyaluronic acid implant for malar and mental enhancement. Dermatol Surg. 2006; 32 (7):881–885, discussion 885
[4] Mendelson BC, Muzaffar AR, Adams WP , Jr. Surgical anatomy of the midcheek and malar mounds. Plast Reconstr Surg. 2002; 110(3):885–896, discussion 897–911

55
Filler Injection for Sunken Cheeks

Difficulty: ●●
Patient Satisfaction: ●●
Risk: ●

Indications

Hollowing of the cheeks can be seen in some patients who present with serious volume deficits. The loss of malar and buccal fat pads often can lead to a windswept post-facelift appearance as well as wrinkled cheeks, deepened nasolabial folds, and the presence of jowls. In many cases, the hollow submalar and buccal concavities are better suited to augmentation than surgery; however, filling these regions with autologous fat may be performed as an adjunct to rejuvenation surgery.

In evaluating the patient as a whole, often he or she is noted to have flattened cheekbones and a hollow appearance under the eyes. Implementation of the techniques described in Chapter 53 and Chapter 54 often improves the appearance of the submalar area and decreases the volume necessary to correct the deformity in this region.

Anatomic Considerations

The area under the zygomatic arch and lateral to the nasolabial fold and modiolus comprises the submalar and buccal regions of the midface.

Injection Technique

Topical anesthesia is usually sufficient for these injections. The injection technique should be a grid or fanning pattern, spreading the product in a medial to lateral fashion. The plane of injection is usually at the dermal–subcutaneous junction. Gentle massage after injection helps to smooth irregularities.

Newer injection techniques developed by de Maio have been described using the higher G′, products like Juvéderm Voluma and Restylane Lyft. Volumization of this region is performed by pulling/pinching the cheek laterally and placing product along the periosteum in a depot or peaking type of injection. Improvement in the nasolabial fold and occasionally the upper marionette region can be seen using this technique.

To conserve product and achieve a nice elevation, the maximal cheek prominence region can be identified and one bolus placed in this “sweet spot” for malar elevation. This can also camouflage the malar mound.

Precautions

Injecting too superficially in this region can result in ridges or striping of material. Placing the product in deeper planes will necessitate using more material. Lumpiness in this region is common after injection, and the injector should massage the area after injection to ensure even placement of product. Placement of product too deeply will project some of the volume into the oral cavity because the buccal area is not supported by bone.

Post-Injection Instructions

Ice and pressure are helpful to prevent bruising. The product will swell some and will feel firmer to palpation the first week, and then blend in more naturally. A gentle post-injection kneading massage can be helpful. Care should be taken to avoid excessive pressure in the injected region for 24 hours. Instruct the patient to apply ice packs lightly to the cheeks to avoid flattening out the product.

Risks

This is a low-risk procedure, but if very large volumes of product are necessary, the excess filler can "weigh down" the cheek. In these excessively hollow patients, consider using poly-L-lactic acid (PLLA) or fat augmentation. Care must also be taken to ensure symmetry is achieved.

Pearls of Injection

- Inject at different levels and massage to evenly disperse product. Large volumes of product are necessary to properly correct these areas.
- To best treat a patient on a modest budget, begin the injection medially and near the inferior aspect of the zygomatic arch.
- The goal is to ease the transition from the high to low regions and create a softer step-off transition.

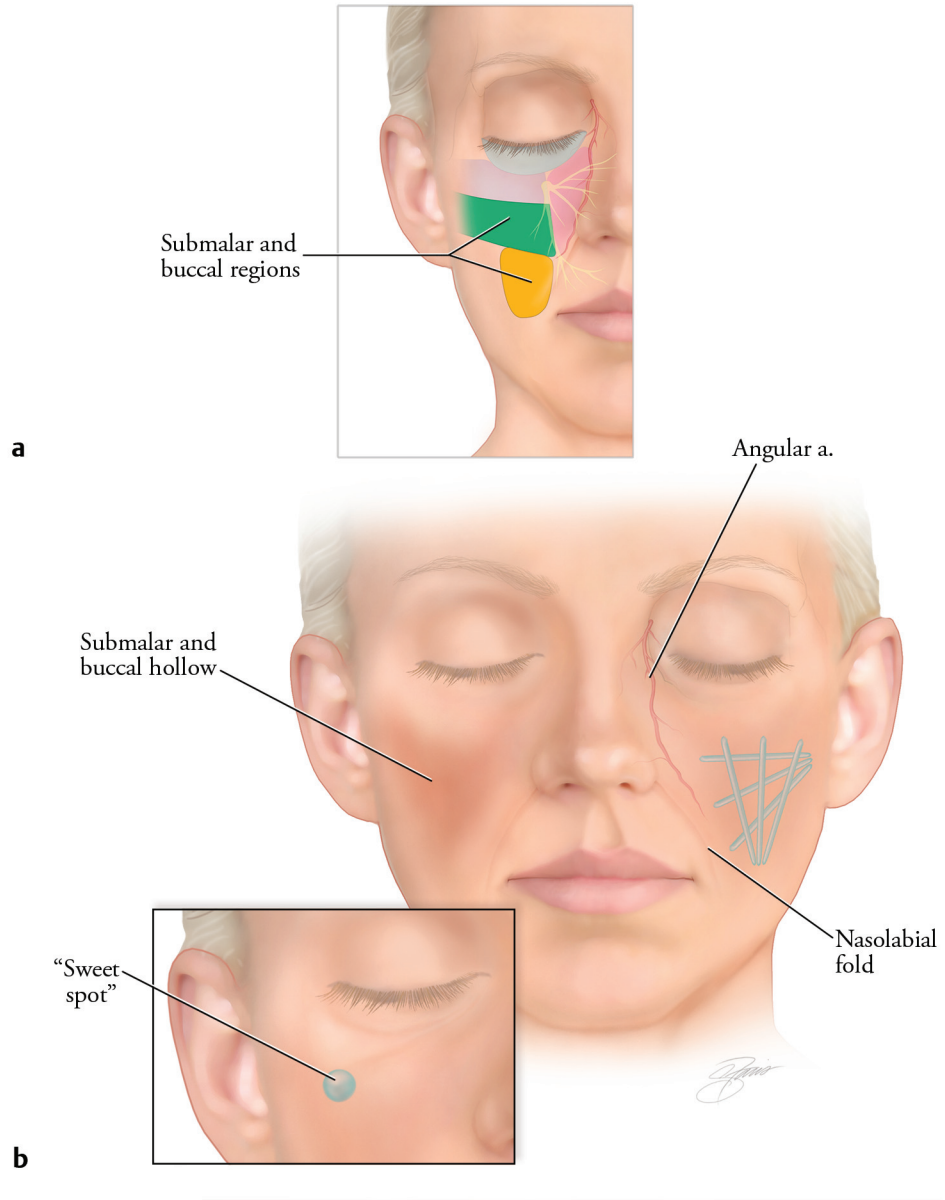


Fig. 55.1 (**a**) The submalar and buccal regions of the midface lie inferior to the zygomaticomalar region and lateral to the infraorbital nerve. (**b**) Filler is placed at different depths in a crossed fanning technique to elevate the submalar and buccal hollows. (**c**) "A sweet spot" peaking injection elevates the cheek with one targeted injection.

Additional Reading

[1] Cattin TA. A single injection technique for midface rejuvenation. J Cosmet Dermatol. 2010; 9(3):256–259

[2] Raspaldo H, Aziza R, Belhaouari L, et al. How to achieve synergy between volume replacement and filling products for global facial rejuvenation. J Cosmet Laser Ther. 2011; 13 (2):77–86

56
Filler Injection for Cheek Lift: de Maio Technique

Difficulty: ●●
Patient Satisfaction: ●●●●
Risk: ●●

Indications

Fillers may be used to augment the cheekbones or lateral malar prominence either when a bony deficiency exists or when soft tissue overlying the bone has been lost due to aging and volume loss or redistribution. Dr. Mauricio de Maio, a plastic surgeon from Brazil who has lectured as a speaker for Allergan, describes a repeatable technique using Juvéderm Voluma XC to augment the cheek bones with the goal of addressing volumetric loss in the midface, lift and widen the midface, decrease hollows under the eye, soften the nasolabial folds and marionette lines somewhat, and lift the face in general.

Anatomic Considerations

The malar bone, the inferior and lateral orbital rims, orbicularis oculi muscle, and infraorbital nerve are important anatomic landmarks in the area of this injection. High cheekbones, a short lower eyelid, and a smooth transition to the cheek contribute to a youthful arc seen in three-quarter view. Utilization of this technique may decrease the amount of filler needed to treat the nasolabial folds.

Injection Technique

Although de Maio described this technique using Juvéderm Voluma XC, other fillers that provide lift and support can also be used in this area, including the thicker HA products, calcium hydroxylapatite (CaHA), or even PLLA. This technique involves injecting depots (or peaking technique) of approximately 0.2 mL into four distinct areas described as V1 through V4, while pulling the cheek posteriorly and superiorly to "spot weld" the tissue, resulting in a cheek lift. Some patients will need more and some less than 0.2 mL depending upon their degree of volume loss. The depot injections are placed deep onto the maxillary periosteum.

The first step is to determine the lid–cheek junction and note or mark it on the patient, as well as the zygoma or cheek bone out toward the ear. The lid–cheek junction marks the transition of the thin skin of the eyelid to the thicker skin of the cheek, often coinciding with the lower edge of the dark circle under the orbital fat.

The V1 injection site is a few centimeters outside the lateral canthus at a point where the lid–cheek junction has been determined to fall on the patient. V2 corresponds to the point on the line dropped perpendicular from the lateral canthus as it hits the lid–cheek junction. V3 is then 1 to 2 cm medial to the lateral

canthus, but lateral to the infraorbital nerve and foramen, which is 2 cm below the orbital rim at the level of the pupil. Finally, V4 lies inferiorly and lateral to V2 on the lower aspect of the zygomaticomalar junction. This injection is more commonly a combination of subcutaneous and depot rather than pure depot as it is filling a broader submalar hollow.

A further modification of this technique by the authors, which can provide more lift to the lower face and a more natural cheek, is the addition of a second syringe lateral to V1 in a depot technique extending in small boluses V-1 to V-2 along the outer edge of the zygoma out to the hairline. This can also extend up the lateral orbital rim Y1 superior to V2 in order to increase the center of gravity of the cheekbone and lift the eye further.

Precautions

This is a very safe injection location so long as the vessels in the infraorbital area are avoided. Performing a reflux maneuver during the injection increases safety by avoiding direct vessel injection in this area.

Post-Injection Instructions

Ice may be used as needed; no massaging is necessary except when PLLA is used. Swelling can increase for a few days before resolving. If a patient likes the appearance while swollen, then the patient should wait a few weeks before coming back for more, so as to get the clearest picture of how much is truly needed.

Risks

Bruising is possible. The greatest challenge with performing this procedure is ensuring symmetry. Pretreatment photography, including 3D images, is useful for achieving optimal results and reminding patients of what they looked like before treatment began.

Pearls of Injection

- Cannulas may be used for the deep injections in the V4 area especially, as they deliver product from a side port in contradistinction to a needle, which will accurately place product on the periosteum.

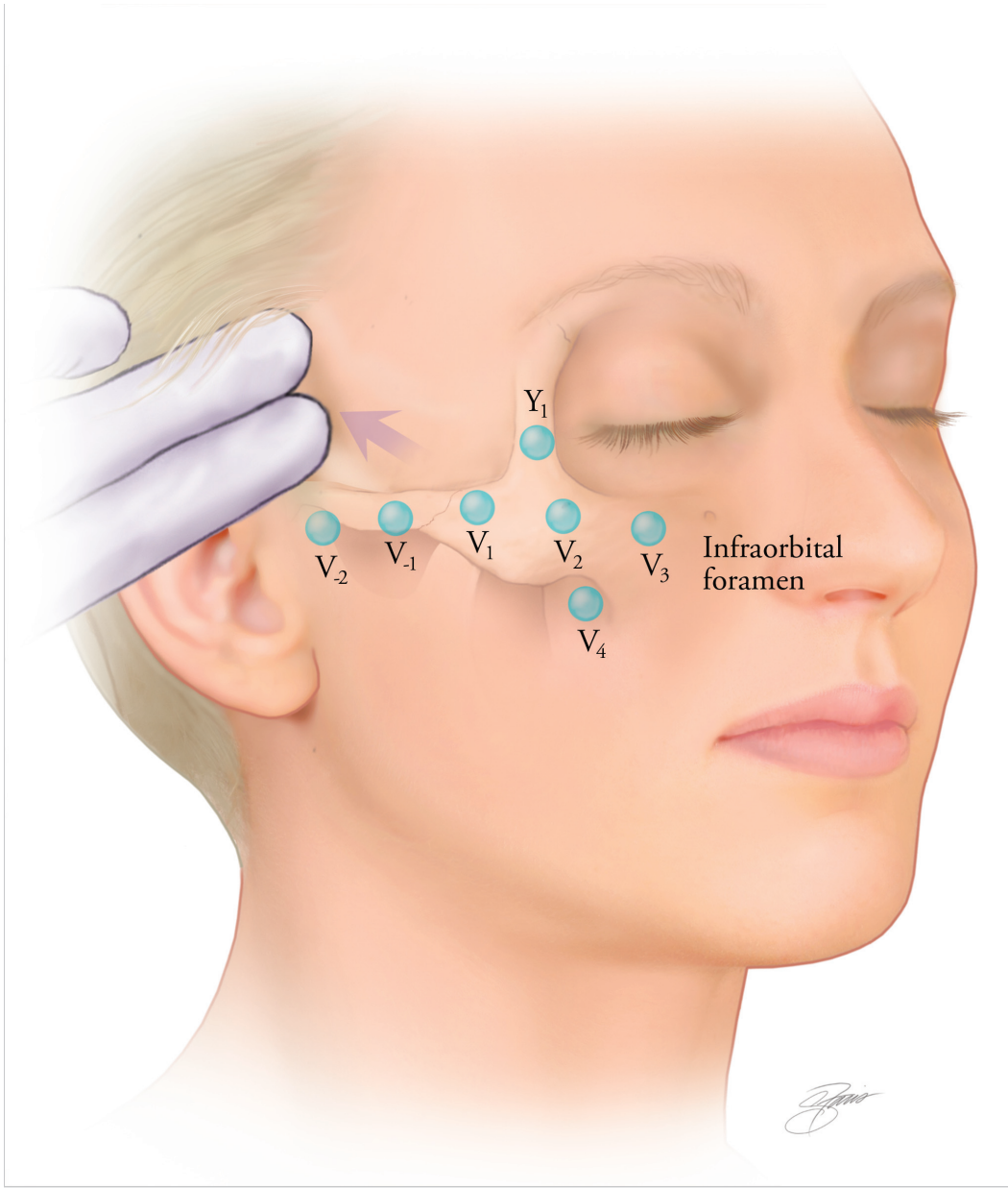


Fig. 56.1 The de Maio injection technique: depot or peaking techniques placed deeply. V1, zygomatic arch; V2, zygomatic eminence; V3, anteromedial cheek; V4, submalar. Further modification of this technique may include V-1 and V-2 placed posteriorly and Y1 placed superiorly to soften the transition zones and "blend" the volumization.

Additional Reading

[1] Cotofana S, Schenck TL, Trevidic P, et al. Midface: clinical anatomy and regional approaches with injectable fillers. Plast Reconstr Surg. 2015; 136(5) Suppl:219S–234S

[2] De Maio M, Rzany B. Injectable Fillers in Aesthetic Medicine. 2nd ed. Springer-Verlag; 2014

57
Filler Injection for Chin Augmentation

Difficulty: ●●
Patient Satisfaction: ●●●
Risk: ●

Indications

The weak chin is usually best addressed with a permanent surgical solution, such as an alloplastic implant. However, augmentation with a filler can be a good alternative in the following situations: the patient needs only small amounts of augmentation; the patient is elderly or a poor surgical candidate; the patient is already scheduled to undergo lower facial volume restoration; the patient is looking for immediate results without surgical downtime or great expense; the patient is considering a chin implant but is hesitant about receiving a permanent implant; or the patient has a cleft chin and wants a smooth contour across the center of the chin.

Anatomic Considerations

The bone structure of the mandible can be too "squared," "pointed," or "weak," and filler can be used creatively to shape or augment the chin. During injection, be cognizant of the location of the mental nerves and adjacent vessels exiting the mental foramen.

Injection Technique

There are two basic techniques that are useful for filling the chin: deep depot injections onto the periosteum to truly mimic a surgical implant; and fanning, threading-type injections in the subdermal plane that spread over a broad area. The more superficial injection techniques should be at the dermal subcutaneous junction so as to add volume as well as to firm the overlying skin, which is often less firm than it once was. With the threading technique, a longer 1.0- to 1.5-inch (2.5- to 3.8-cm) needle of 27- to 30-gauge works best. The depot is easily placed along the border of the mandible so long as the mental foramen is avoided.

Precautions

Determine where the mental foramen and nerve are located, and avoid that region when injecting. If a chin implant is already in place, use careful sterile technique and avoid directly injecting into or onto the implant to avert seeding the implant with bacteria. Consider a short course of antibiotics post injection if the chin implant is encountered with the needle.

Post-Injection Instructions

Immediate pressure and then ice are helpful to minimize bruises. The chin initially will appear swollen and more rounded than it will appear once the edema subsides.

Risks

Minimal risks occur, besides bruising, with the superficial technique if the injections are smooth and even. When injecting deeply onto the bone, there are more inherent risks for damage to the mental nerve, and possible intravascular injection if a depot injection is used.

Pearls of Injection

- Evaluate the chin from all angles to ensure that it looks proportionate and balanced all over, as symmetry will be important as well as challenging when trying to fill a whole midline structure.
- Massage of the area will aid in smoothing any injection irregularities.

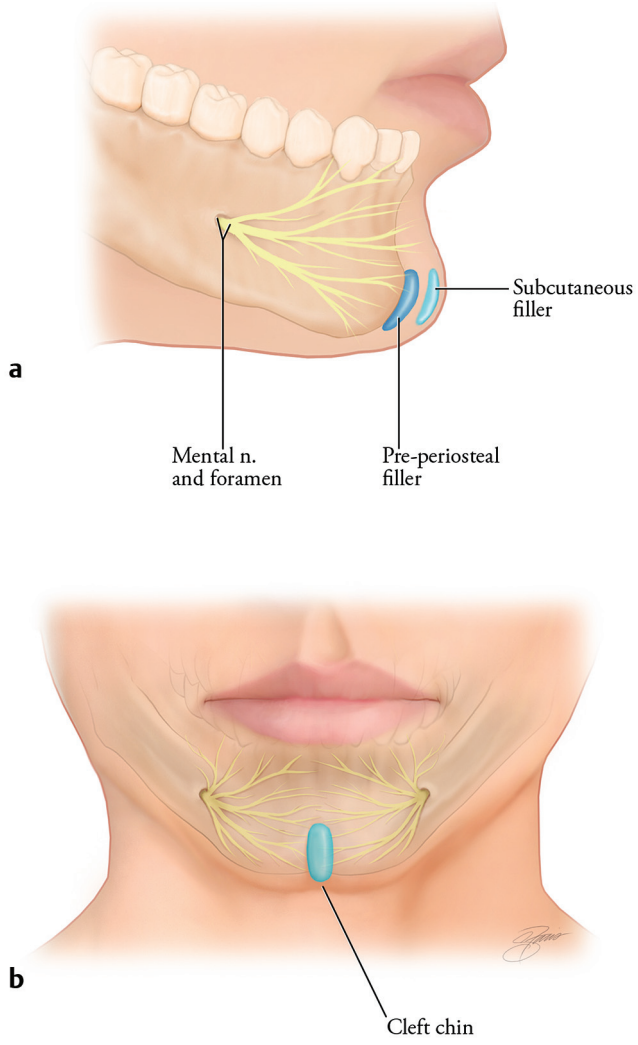


Fig. 57.1 (**a**) Filler is placed on the periosteum and/or in the subcutaneous tissue to increase prominence of the chin. (**b**) Filler may be placed subcutaneously to camouflage a chin cleft.

Additional Reading

[1] Binder WJ, Dhir K, Joseph J. The role of fillers in facial implant surgery. Facial Plast Surg Clin North Am. 2013; 21(2):201–211

[2] Sykes JM, Fitzgerald R. Choosing the best procedure to augment the chin: is anything better than an implant? Facial Plast Surg. 2016; 32(5):507–512

58
Filler Injection for the Mental Crease

Difficulty: ●
Patient Satisfaction: ●●
Risk: ●

Indications

The mental crease (or chin crease) is the horizontal crease between the lower lip and chin, which can be quite deep in some individuals.

Anatomic Considerations

The paired mentalis muscles originate on the incisor fossa of the mandible and insert directly into the dermis of the chin skin. Contraction of the mentalis muscles elevates the lower lip and contributes to the mental crease.

Injection Technique

This is a painful area to inject; a topical or dental block may be utilized. Filler is injected at multiple levels in the dermis and subdermal subcutaneous tissue to elevate the crease. A combination of linear threading both parallel and perpendicular to the crease can be used. Deeper creases can be treated with depot techniques.

Precautions

Superficial injection of some hyaluronic acids (HAs) will result in bluish blebs of material. Do not over-inject this area. Massage after injection to maximize smoothness.

Post-Injection Instructions

Bruising is possible; ice as needed.

Risks

This is a very safe area to inject. Deep creases may require a large amount of filler.

Pearls of Injection

Filler used alone in this area tends to last for very short periods of time. However, in conjunction with BoNTA injection to the mentalis, the duration of any filler in this area is significantly improved. Neurotoxin may be injected into the mentalis muscles as in treatment of the peau d'orange chin (see Chapter 19), which may also help to flatten the mental crease.

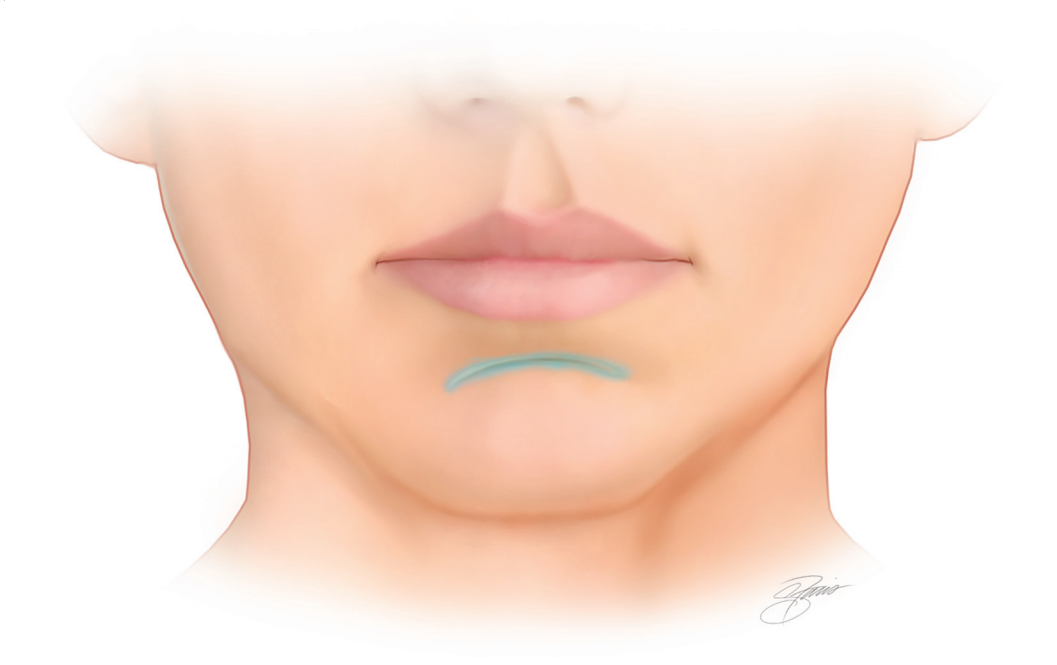


Fig. 58.1 The mental crease can be improved by injection of filler in the subcutaneous tissue beneath the concavity.

Additional Reading

[1] Brandt FS, Cazzaniga A. Hyaluronic acid fillers: Restylane and Perlane. Facial Plast Surg Clin North Am. 2007; 15(1):63–76, vii

[2] Romagnoli M, Belmontesi M. Hyaluronic acid-based fillers: theory and practice. Clin Dermatol. 2008; 26(2):123–159

59
Filler Injection for Jawline Rejuvenation

Difficulty: ●●
Patient Satisfaction: ●●
Risk: ●

Indications

Prejowl sulcus fat loss and descent of the midface can accentuate the formation of the jowls. By filling the concave area just anterior to the jowl, a straighter, more youthful jawline can be achieved. However, the formation of jowls is multifactorial, and often a facelift is the only treatment that can adequately lift or remove the jowl.

Anatomic Considerations

Aging changes of the jawline are a result of draping of excess skin, sagging of buccal fat, loss of prejowl fullness, and changes in the submental platysmal angle. Filling the prejowl area, both in the area of the marionette lines as well as in the area at and below the mandible, creates a much more pleasing anterior mandibular contour. Augmentation of the prejowl sulcus must occasionally be addressed when surgical options are planned, by the use of either filling agents or prejowl surgical implants.

Injection Technique

Hyaluronic acids (HAs) are commonly used in this area. They may be injected at the dermal subcutaneous junction so as to add volume as well as to firm the overlying skin, which is often less firm than it once was. A threading technique with 1.0- or 1.5-inch (2.5- to 3.8-cm) needles of 27- or 30-gauge works best. The injection must bridge all the way from the high point of the jowl and blend forward to the firm, level portion of the chin.

Alternate Technique

Subdermal injections may be combined with depot injections along the mandible. For such deep injections, HA, calcium hydroxylapatite (CaHA), or polymethyl methacrylate (PMMA) can be used safely, and these deep injections can mimic a true prejowl implant. This technique requires more product volume than do the more superficial injections to achieve a similar effect.

Precautions

Bruising is very common with the subdermal injection. Care must be taken to avoid the mental foramen, as paresthesias could occur with a direct injection into the foramen.

Post-Injection Instructions

Immediate pressure and then ice are helpful to minimize bruising.

Risks

Minimal risks occur, besides bruising, with the superficial technique if the injections are smooth and even.

Pearls of Injection

- Massage the product to shape it and re-create the mandibular jawline.
- Include injection along the inferior aspect of the mandible to fill in the entire prejowl concavity.
- Consider using a cannula for injection into this region, as precision of filler placement is not required in this location.

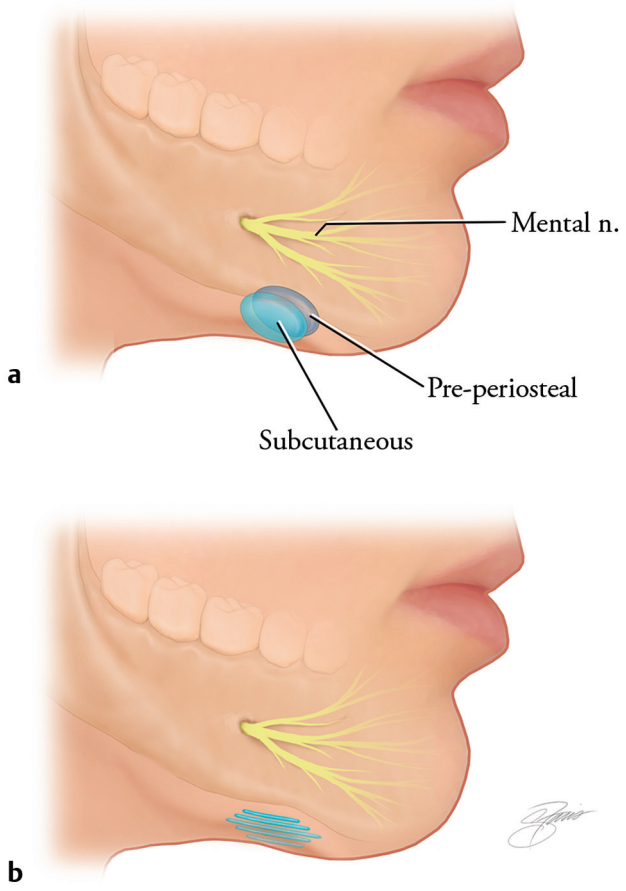


Fig. 59.1 (**a**) Filler can be placed in the preperiosteal or subcutaneous planes to augment the prejowl sulcus. (**b**) Filler can also be placed subcutaneously in a linear fashion. A combination of these techniques may be required for optimal correction.

Additional Reading

[1] Braz A, Humphrey S, Weinkle S, et al. Lower face: clinical anatomy and regional approaches with injectable fillers. Plast Reconstr Surg. 2015; 136(5) Suppl:235S–257S

[2] Moradi A, Watson J. Current concepts in filler injection. Facial Plast Surg Clin North Am. 2015; 23(4):489–494

60
Filler Injection for Mandibular Angle Augmentation

Difficulty: ●●
Patient Satisfaction: ●●●
Risk: ●

Indications

A strong jawline is considered a masculine characteristic, and some men request augmentation of this region. In the past, alloplastic implants were used, but filler can now be used to augment this region nicely. This injection technique may also be used in women who have a very small mandibular angle prominence, or to improve symmetry in patients with obvious mandibular asymmetries.

Anatomic Considerations

The mandibular angle has both a horizontal and a vertical component, and the injector must assess which areas require augmentation.

Injection Technique

Marking out the planned injection is often helpful in treating these patients. Ideal fillers for this region are thicker and provide enhanced lift and can include CaHA, PLLA, and the thicker HAs like Restylane Lyft, Restylane Defyne, and Juvéderm Voluma.

Topical anesthetic is placed and a 30-gauge needle is used, although a 25-gauge, 1.5-inch (3.8 cm) needle or a small cannula can be useful for tunneling product and preventing multiple needle sticks. Injections are placed in the deep subcutaneous plane in a retrograde tunneling fashion, then molded into place to prevent lumpiness. Achieving symmetry is the most difficult part of this procedure.

PLLA can also be used in this area, with product placed in the deep subcutaneous tissues and massaged for 5 minutes, 5 times a day for 5 days. Approximately three treatment sessions are performed 6 weeks apart until improvement is seen. Results with PLLA can last up to 2 years.

Precautions

Injections should be placed low along the mandibular border and extended superiorly in the preauricular region. Care should be taken to avoid the retromandibular vessels.

Post-Injection Instructions

Injections in this region are well tolerated. Ice can be used as needed, although bruising and swelling are usually minimal.

Risks

Asymmetric enhancement and undercorrection are the most common complications with this procedure.

Pearls of Injection

- Marking the areas prior to injection helps in assessing the area of mandibular deficiency and planned injection sites.
- Some patients request excessive augmentation, and multiple treatment sessions for such patients is recommended.

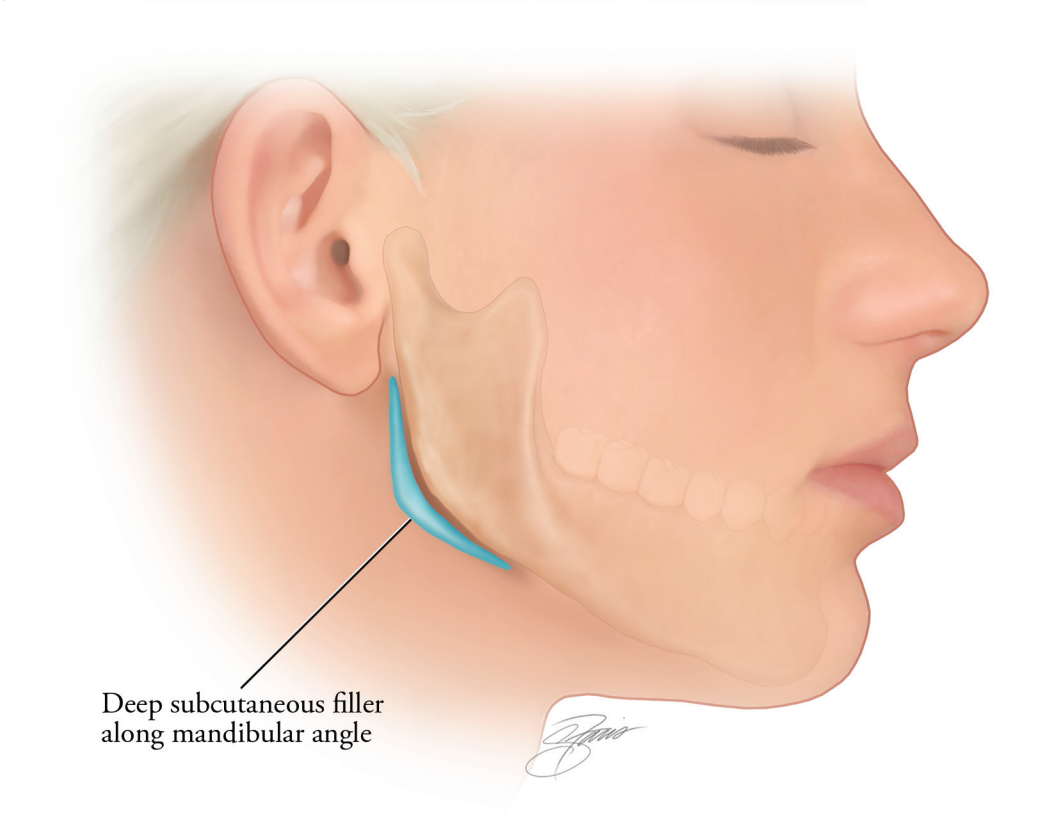


Fig. 60.1 Injection of filler to augment the mandibular angle.

Additional Reading

[1] Moradi A, Watson J. Current concepts in filler injection. Facial Plast Surg Clin North Am. 2015; 23(4):489–494

[2] Schierle CF, Casas LA. Nonsurgical rejuvenation of the aging face with injectable poly-L-lactic acid for restoration of soft tissue volume. Aesthet Surg J. 2011; 31(1):95–109

61
Filler Injection for Earlobe Rejuvenation

Difficulty: ●
Patient Satisfaction: ●●●
Risk: ●

Indications

The earlobes flatten with age and lose their volume. This flattening combined with elongated piercing holes can result in the downward hanging of stud earrings. Re-volumization of the lobes contributes to a more youthful look and more attractive earring positioning.

Anatomic Considerations

Fill the lower aspect of the earlobe to provide structural support to the earring and restore volume to the earlobe.

Injection Technique

Hyaluronic acid (HA) should be placed in the subcutaneous tissue in a U-shape around the pierced hole until adequate filling of the earlobe is seen. Alternately, poly-L-lactic acid (PLLA) may be used in a similar fashion, but the results will take longer to achieve. The added volume and support of the earlobes help add firmness needed to elevate drooping earrings.

Precautions

None.

Post-Injection Instructions

Ice as needed.

Risks

None: this is a very safe procedure to perform, yielding high patient satisfaction.

Pearls of Injection

- This is a nice technique to offer patients, especially when looking for an appropriate place for the last little bit of product remaining in the syringe after treatment of other facial areas.

Fig. 61.1 Hyaluronic acid may be placed in the earlobe both to support a hanging pierced earring and to restore volume to the deflated aging lobe.

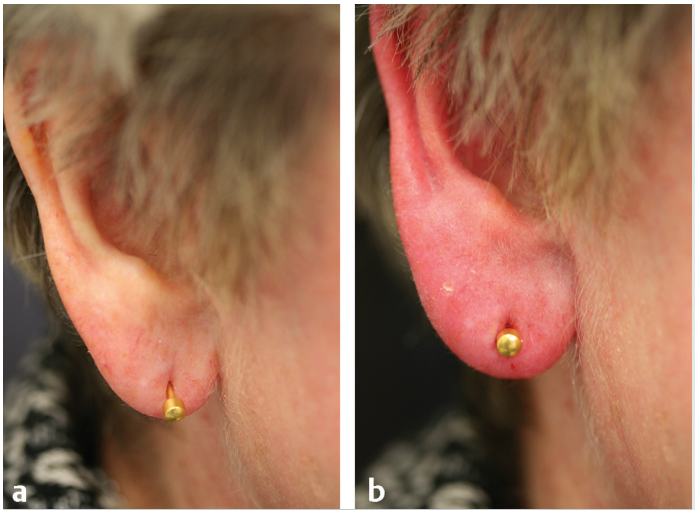


Fig. 61.2

Additional Reading

[1] Hotta T. Earlobe rejuvenation. Plast Surg Nurs. 2011; 31 (1):39–40

[2] Qian W, Zhang YK, Cao Q, Hou Y, Lv W, Fan JF. Clinical application of earlobe augmentation with hyaluronic acid filler in the Chinese population. Aesthetic Plast Surg. 2017; 41(1):185–190

62
Filler Injection for Acne Scars

Difficulty: ●●
Patient Satisfaction: ●●
Risk: ●

Indications

Severe cystic acne can lead to large, depressed facial scars. These scars can include depressions in the dermis as well as the subdermal fat. The shadowing of these depressed scars can accentuate their deep appearance, and elevation with fillers will minimize the shadowing and improve the overall skin contour. Although some flattened scars and concavities can be improved with fillers, enlarged pores and icepick scars will not improve with such injections.

Anatomic Considerations

Prior to injection of the scar, the injector may perform a "stretch" test to determine if the scar will improve with filler injection. If the scar flattens out with skin stretching, the scar will likely elevate and improve with filler. If it does not elevate, it may require release of the dermal attachments by subcision, or it may require direct excision. Most injections will be placed intradermally or in the immediate subdermal plane. To prevent lumpiness in areas with thin skin, such as the temple and the lower eyelid, very small amounts of filler should be injected.

Injection Technique

Any filler may be used for these injections; however, we commonly use hyaluronic acids (HAs) or PMMA. The injection technique should start with a 30-gauge needle so as to layer and cross-hatch the intended area with multiple passes from different angles. Part of the correction requires subcision within the dermis and subdermis to break up fibrosis and scar tissue. The action of the needle moving back and forth across the scar will disrupt the fibrous attachments deep to the scar and permit its elevation with filler. A significant amount of force is necessary to introduce the product into the scar area. If no resistance is met, then the needle is probably too deep. It is best to introduce the needle 4 to 5 mm away from the edge of the scar area so that the product does not escape out of the puncture site when the needle is withdrawn or when the next pass is made from a different angle.

Precautions

If there are large pores in the area being injected, the needle may need to be passed at a deeper or different angle, especially if product begins to extrude through one of the dilated pore tracts. Over-injection of a given area can lead to blanching or even intravascular occlusion.

Post-Injection Instructions

Ice and pressure are helpful to prevent bruising and lumpiness. The product will swell somewhat with an HA and feel firmer to palpation the first week and thereafter blend in more naturally. The

patient should expect that the areas injected will look raised initially.

Risks

Minimal risks exist besides bruising and Tyndall effect from overly superficial injection into the dermis.

Pearls of Injection

The force of the injection and the presence of the product in the expanded space of the scar can actually stimulate neocollagenesis. Unless adequate release of scar tissue is performed at the center of a depressed scar, filling the area can create a mound that will accentuate the shadowing at the base of the scar.

Consider layering fillers, placing calcium hydroxylapatite (CaHA) deeply in the subcutaneous tissues and HA more superficially in the deep to superficial dermis. Restylane has more lifting qualities than does Juvéderm and is preferred for acne scars. Collagen is also an excellent scar elevator. Polymethyl methacrylate (PMMA) may be used as well, usually several days after subcision has been performed.

Fig. 62.1 Some acne scars may be elevated by placing filler deep to the scars. Scars that do not elevate with filler alone may require subcision to release dermal attachments prior to injection.

Additional Reading

[1] Carvalho Costa IM, Salaro CP, Costa MC. Polymethyl methacrylate facial implant: a successful personal experience in Brazil for more than 9 years. Dermatol Surg. 2009; 35(8):1221–1227

[2] Goldberg DJ, Amin S, Hussain M. Acne scar correction using calcium hydroxylapatite in a carrier-based gel. J Cosmet Laser Ther. 2006; 8(3):134–136

[3] Joseph JH, Eaton LL, Cohen SR. Current concepts in the use of Bellafill. Plast Reconstr Surg. 2015; 136(5) Suppl:171S–179S

[4] Smith KC. Repair of acne scars with Dermicol-P35. Aesthet Surg J. 2009; 29(3) Suppl:S16–S18

63
Filler Injection for Aging Hands

Difficulty: ●●●
Patient Satisfaction: ●●●
Risk: ●●

Indications

The back of the hand is an area that often shows a person's age even while the face and body are well maintained and physically fit. The aging hands manifest dyschromias, loss of fat, thinning of the skin, and grooving of the spaces between the extensor tendons of the fingers.

Anatomic Considerations

For superficial injections of the hand dorsum, the anatomic concerns include a superficial venous arcade and the long extensor tendons. For deeper injections, the injector must be aware of the location of the interosseus muscles and the five metacarpal bones of the hand.

Injection Technique

Hyaluronic acid (HA) or calcium hydroxylapatite (CaHA) can be used to augment this region. These fillers provide instant gratification and a soft, even fill in the space between the skin and the interosseous muscles. The injections should be performed as if there are separate compartments between each metacarpal. It is best to avoid injecting directly over the tendons and bones, as it is more likely to lead to surface irregularities. As the area being injected is a long, narrow compartment with many large veins throughout, it is best to us a long needle (either 1.0- or 1.5-inch [2.5- or 3.8-cm], of 25- to 27-gauge) to inject product deep to veins and the skin into the deep subcutaneous layers, or right above the muscle if necessary. All injections should be performed as retrograde threading or fanning to avoid vessel injection.

An alternative technique is to place depot injections and massage the product to fill in the hollows between the tendons.

Precautions

With so many large and torturous vessels in this area, hitting one or even a few is often inevitable. Ice ahead of time, and quick, firm pressure on the site of injection as soon as the needle is withdrawn, can help keep hematomas or very large bruises from forming.

Post-Injection Instructions

Ice and firm pressure are helpful to prevent bruising. The product will swell somewhat with an HA and feel firmer to palpation the first week and thereafter blend in more naturally. The patient should expect that the areas injected will look raised and welted at first. Swelling should settle down within about 2 to 4 days.

Risks

The most significant risks involve injection irregularity and the product not feeling and looking smooth. It is important to massage uneven areas soon after injection so as to avoid a longer-term problem, although an even injection technique is always more effective than any amount of massage.

Pearls of Injection

- Undercorrection is usually safest, as well as injecting with the needle in motion so as not to inject into a vessel and create an occlusion or an embolic situation.

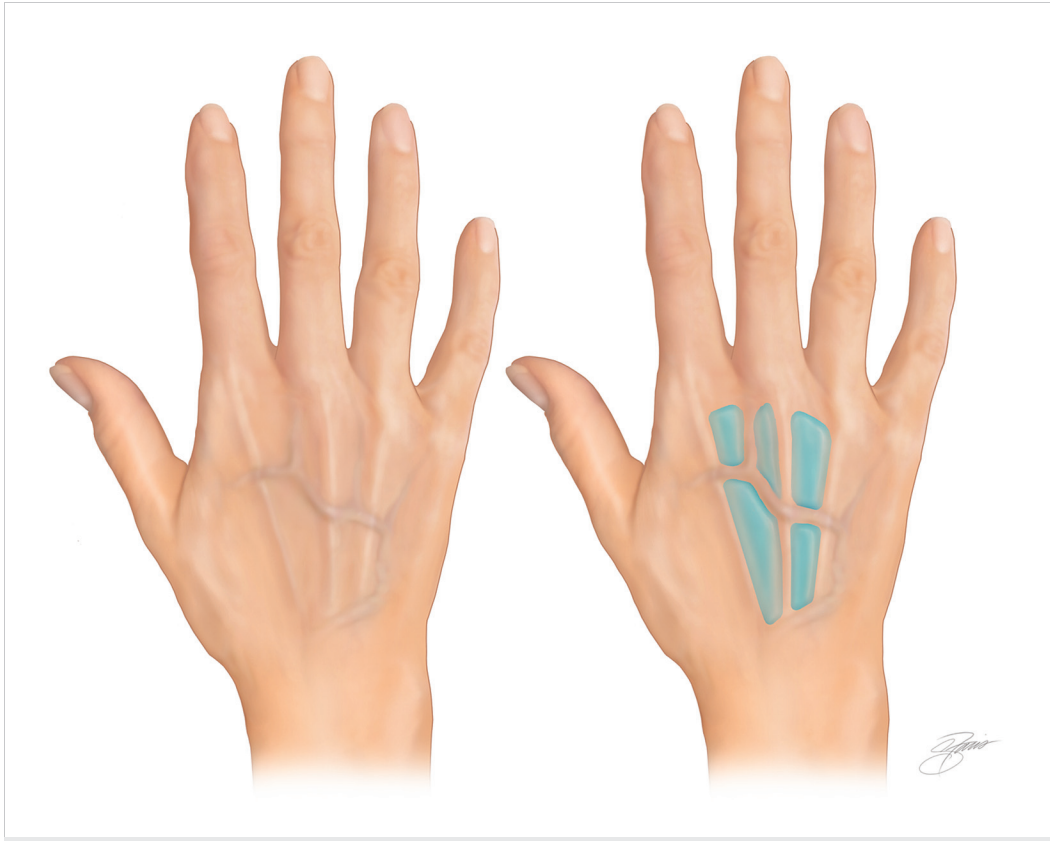


Fig. 63.1 Filler is placed subcutaneously and massaged into place to improve the hollows of the aging hand.

Additional Reading

[1] Butterwick K, Sadick N. Hand rejuvenation using a combination approach. Dermatol Surg. 2016; 42 Suppl 2:S108–S118

[2] Edelson KL. Hand recontouring with calcium hydroxylapatite (Radiesse). J Cosmet Dermatol. 2009; 8(1):44–51

[3] Lefebvre-Vilardebo M, Trevidic P, Moradi A, Busso M, Sutton AB, Bucay VW. Hand: clinical anatomy and regional approaches with injectable fillers. Plast Reconstr Surg. 2015; 136(5) Suppl:258S–275S

64
Filler Injection with Poly-L-Lactic Acid for Facial Volumizing (Sculptra)

Difficulty: ●●●
Patient satisfaction: ●●
Risk: ●●●

Indications

The aging face undergoes lipoatrophy and essentially "deflates" prior to succumbing to the effects of gravity. Fat augmentation of the face is gaining in popularity; however, poly-L-lactic acid (PLLA) may provide similar results without the need for a surgical intervention. In addition, many thin faces are part of a body that is also depleted of fat, so with no adequate donor site for fat augmentation, PLLA may be a viable alternative. PLLA is a biostimulatory filler, and multiple treatments are necessary.

Anatomic Considerations

Prior to injecting this product, it is essential to have a thorough understanding of the facial aging process to accurately restore volume to a more youthful shape. PLLA is not intended to be injected into the muscle. Therefore, the injections should be directed either into the more superficial subcutaneous planes in the lower face or near the periosteum below the muscles of the upper face.

Injection Technique

Re-suspension of product is performed preferably 48 hours prior to injection, but product may be reconstituted anytime between 20 minutes to 3 days prior to the procedure using preserved water. Preserved water is preferred because it allows a longer shelf life after rehydration. (According to the manufacturer, if saline is inadvertently used for re-suspension, then the product should not be used. However, some injectors routinely use saline and have not reported any problems.) The volume of water used should be 5 mL or more per vial. Xylocaine (1 or 2%) should be added to each vial (1 to 3 mL) just prior to performing the injections to increase patient comfort. Some injectors advocate using lidocaine with epinephrine 1:100,000 to theoretically minimize bruising: the authors do not use this mixture and have not found that its benefits outweighed its complications.

Targeted on-label areas for injection include the temples, nasolabial folds, cheeks, pre- and post-jowl regions, and melolabial folds. Advanced areas that lead to good results in experienced hands include the brows, infraorbital rims, midface, and lateral orbital rims. Injection is placed in the superficial subcutaneous or pre-periosteal planes, *not intradermally* or in the lips or lip lines. Typically a patient will receive one or two vials at each treatment session. A pan-facial volumization often requires the use of at least six vials over three sessions. In severe cases, more product can be used.

Injection techniques include linear threading in a grid pattern, which is an on-label use, along the cheeks and the whole lower face, or fanning, which is not an on-label use, but results in fewer injection entry sites through the skin. Depot onto the periosteum is used for volumization of the upper half of the face in all areas above the inferior border of the orbicularis oculi muscle. Due to the suspension particle size of the PLLA product, it is necessary to use at least a 26-gauge needle and preferably a 25-gauge needle to inject. With both the depot and the fanning and threading techniques, the use of a 1.0- to 1.5-inch (2.5- to 3.8-cm) needle makes for many fewer puncture sites and a more efficient placement of the product.

Post-Injection Instructions

Immediately after injection, the face is massaged. We apply a thin moisturizer onto the skin, which allows the fingers to glide smoothly. At that time, we teach the patients the massage technique. They are instructed to perform a deep tissue massage of the injected areas for 5 minutes, 5 times a day, for the next 5 days. Bruising can be quite significant, and patients should be warned that they may need to be camouflaged for a week or more because of the volume of injection and the size of the needles.

Patients should be aware that this is a slow process for volumization. They may not see any volume enhancement after the first treatment. In addition, the initial volumization they see is from the injected water, which will resorb in a few days.

Precautions

Nodule formation is the great fear for those injecting this product and is due in most cases to faulty technique. Overly concentrating the particles in one area and not placing the injection at the right plane are the most common reasons for clumping of the product and subsequent collagen overgrowth or granulomatous reaction. The occurrence of nodules and injection sequelae has diminished greatly due to the higher dilutions used and the injection training requirement by the manufacturing company.

Do not inject this product in the circular muscles of the face—the orbicularis oculi and oris—as there is increased incidence of nodules in these areas.

Risks

Intravascular injection is possible, especially along the nasal–alar junction. Perform a reflux maneuver on the syringe prior to injections in this area. One consolation, despite the blanching or hematoma, is that the product is almost entirely watery and that any embolic event will be self- limiting compared with a solid injectable substance.

Pearls of Injection

- Do not attempt this injection without the proper training. Make sure patients understand that it will take several treatments at 4- to 6-week intervals to see results.
- It is almost impossible to over-inject a patient with PLLA.
- To prevent the syringes or needles from plugging, after adding the water reconstitute, allow the product to sit for 48 hours without agitating. When you are ready to add the lidocaine, gently vibrate, stir, or agitate for 5 to 10 minutes to fully suspend the particles. Try to avoid shaking the vial and causing the production of foam, as this tends to increase clogging of the needle.

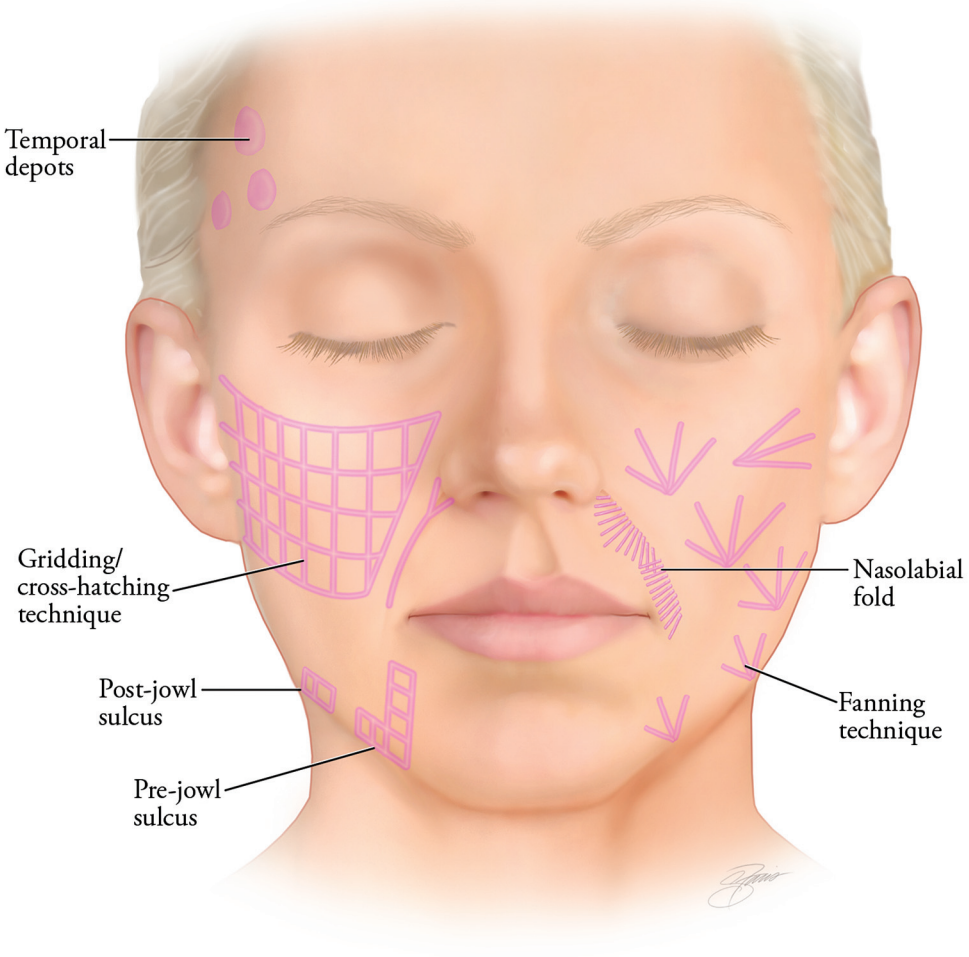


Fig. 64.1 Multiple techniques may be used to inject PLLA. The depot technique is generally used to augment the temples. A grid technique may be used for the cheeks and pre- and post-jowl regions. The injection also may be placed along the nasolabial fold. Alternatively, a fanning technique can be used. A combination of these techniques is also acceptable.

Additional Reading

[1] Fitzgerald R, Vleggaar D. Facial volume restoration of the aging face with poly-L-lactic acid. Dermatol Ther (Heidelb). 2011; 24(1):2–27

[2] Lacombe V. Sculptra: a stimulatory filler. Facial Plast Surg. 2009; 25(2):95–99

65
Filler Injection with Poly-L-Lactic Acid for the Décolleté

Difficulty: ●●
Patient Satisfaction: ●●●
Risk: ●●

Indications

The décolleté (the central chest area) is a region that is often quite sun damaged and wrinkled in women, especially those who grew up in an era before adequate sunscreens. The vertically oriented rhytids fanning upward from the sternal notch, dyschromias, loss of subcutaneous fat, thinning of the skin, and grooving of the spaces between the ribs in more extreme ectomorphs are characteristic of changes found in the aging chest anteriorly.

Anatomic Considerations

For superficial injections of the décolleté, the anatomic concerns include avoiding injury to superficial veins and the presence of preexisting surgical scarring. Deep injections into the muscle or past the bone should be avoided as vital organs and vessels of the thorax lie below.

Injection Technique

Poly-L-lactic acid (PLLA) can be used to effectively augment this region. This stimulatory filler provides a gradual firming to the thin, creased skin so as to provide a thicker, less wrinkle-prone foundation to the chest skin, especially when the elbows are brought together. The dilution of the PLLA should approach 10 to 12 mL of sterile water for injection with or without lidocaine, to insure even distribution of the particles. The injections should be performed in the dermal subcutaneous junction, fanning perpendicular to the vertical rhytids. As the area being injected is a long vertical region, it is best to use a long needle (either 1.0- or 1.5-inch [2.5-to 3.8-cm], of 25- to 27-gauge) to maximize the area of the fanning while decreasing the number of skin entry points, which are the most uncomfortable parts of the procedure. All injections should be performed as retrograde threading or fanning to avoid vessel injection. Typically one vial is injected per session, with usually three sessions performed about 4 to 6 weeks apart.

Precautions

The avoidance of bruising is the most common precaution during the injection process. Pre-treatment with ice, and quick, firm pressure on the site of injection as soon as the needle is withdrawn can minimize larger bruises.

Post-Injection Instructions

Swelling should resolve within about 2 to 4 days. Vigorous massaging for 5 minutes

2 to 5 times per day with a moisturizer, pushing down to feel the underlying sternum and ribs, is necessary for the next 5 to 10 days. The first massage is performed immediately after the initial injection.

Risks

The most significant risks involve injection irregularity and the product not feeling and looking smooth. It is important to massage uneven areas soon after injection so as to avoid a longer-term problem, although an even injection technique is always more effective than any amount of massage.

Pearls of Injection

- Undercorrection is usually safest, as well as injecting with the needle in motion so as not to inject a large bolus of PLLA into a single area and stimulate a bump or nodule formation.

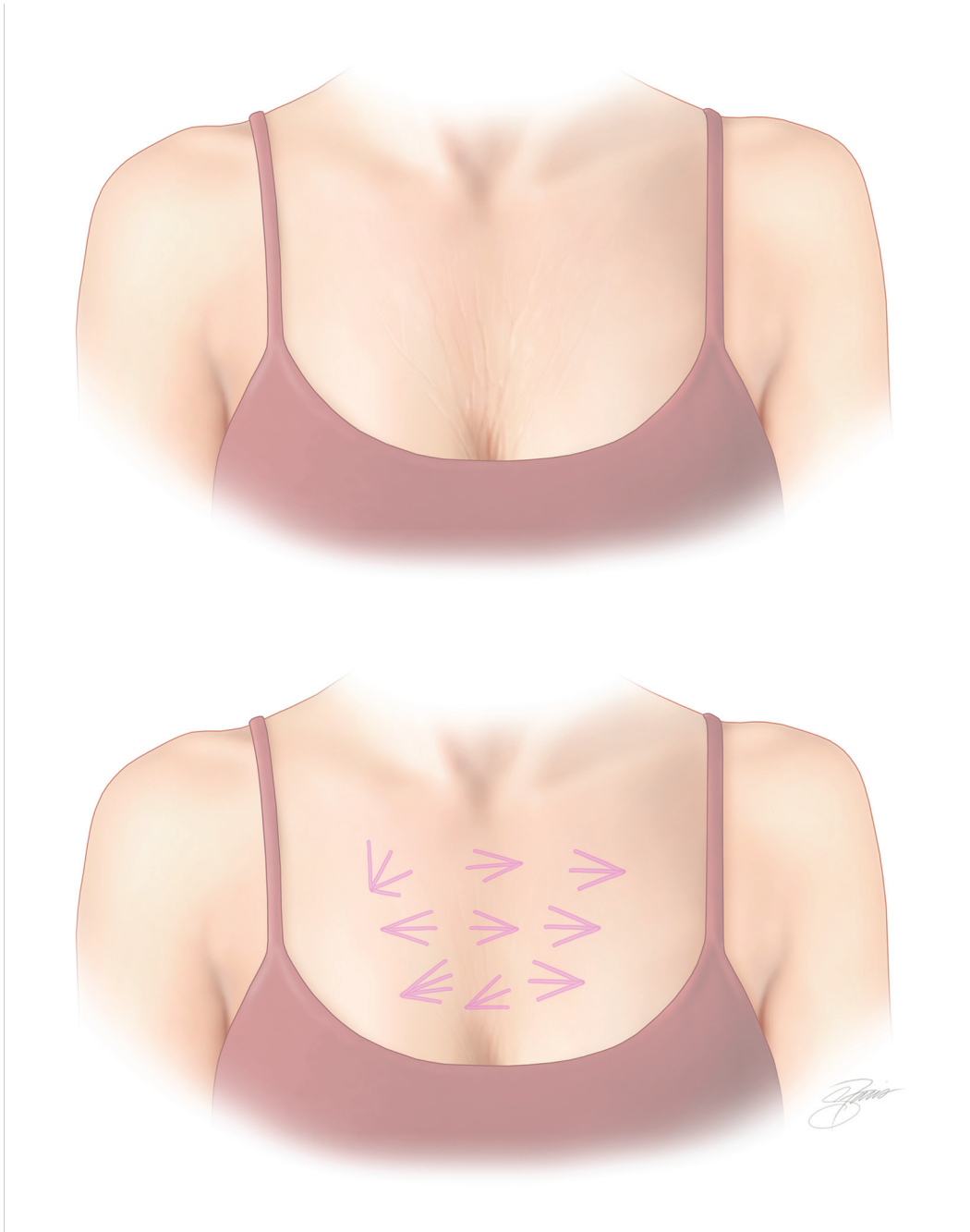


Fig. 65.1 Fanning technique for PLLA injection to décolleté.

Additional Reading

[1] Fulton J, Caperton C, Weinkle S, Dewandre L. Filler injections with the blunt-tip microcannula. J Drugs Dermatol. 2012; 11 (9):1098–1103

[2] Jabbar A, Arruda S, Sadick N. Off face usage of poly-L-lactic acid for body rejuvenation. J Drugs Dermatol. 2017; 16 (5):489–494

66
The “Liquid Facelift”

Difficulty: ●●●
Patient Satisfaction: ●●●
Risk: ●●

What Is a Liquid Facelift?

A combination of fillers and neurotoxins can be used to rejuvenate the face. This technique can be offered to patients who are not willing to undergo surgical treatments. It can be used to contour the face and rejuvenate wrinkles and folds. The results are temporary, and repeated treatments are usually necessary, but overall, the patients note a fresher, more youthful appearance.

“Liquid facelift” is somewhat of a misnomer, as it is not truly a facelift. Applied correctly and artistically, the techniques discussed in this book can be used alone or in combination to improve a patient’s appearance and “set the clock of aging back” perhaps 5 to 10 years.

What a Liquid Facelift Is Not

The liquid facelift is not a replacement for traditional facelift surgery. No amount of fillers and toxins can reposition the superficial musculoaponeurotic system (SMAS), improve the jowls, and remove fat and excess skin from the neck. It is important to accurately counsel patients about what fillers and neurotoxins can and cannot do for them: be sure that patients have the correct expectations prior to treatment.

Complementary Procedures

Fillers and neurotoxins can be used as an adjunct to facial surgical procedures. Treatment of the crow’s feet with neurotoxins (see also Chapter 8) and augmenting the lips with fillers (see also Chapter 42) can be nice adjuvants to facial rejuvenation surgeries.

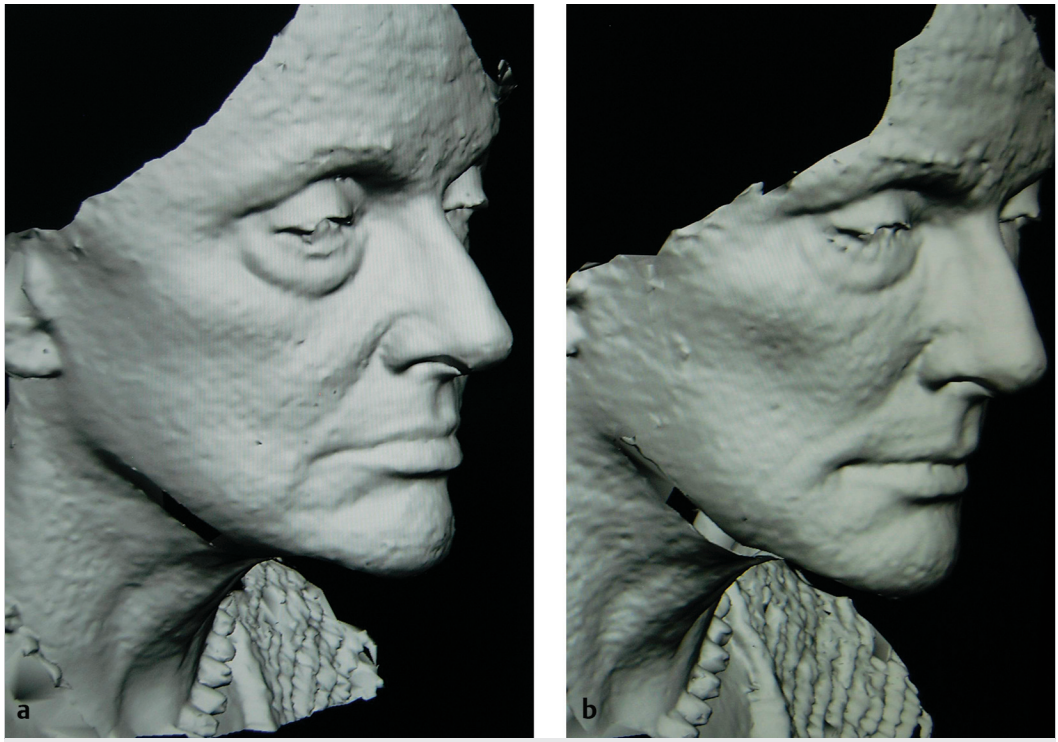


Fig. 66.1 Three-dimensional volume assessment of a patient before (**a**) and after (**b**) treatment with 10 mL Restylane and 50 units of Botox.

67
Gender-Specific Injections

Introduction

Today's patients may not only want to look younger or more rested, they also might wish to masculinize or feminize their face. Combinations of fillers and neurotoxins can be used to achieve these changes in men, women, and transgender patients.

Injections to Masculinize a Face

When one thinks of a masculine face, a heavy brow, strong jawline, and strong chin come to mind. The male brow is lower than the female brow, sits at or slightly below the superior orbital rim, and is minimally arched. The mandibular angle is square, and the chin is prominent. Also, a strong nasal dorsum is usually evident, with a tip that forms a 90-degree (or less) angle with the upper lip. The male midface is more prominent medially than laterally. The lips are properly thin in most men, and rarely do men require lip augmentation. The male face is more angular than the female, with prominence of the brow and mandible.

Masculinization of the face can involve using BoNTA to the forehead to lower the brow (see also Chapter 7), filler to the mandibular angle (Chapter 60), and filler to the chin (Chapter 57). A strong nasal dorsum can also be achieved by adding HA to the nose (Chapter 12). Midface volume in men is much more medial than in women, so volume should be added to avoid accentuating the cheekbones (Chapter 53).

Injections to Feminize a Face

A feminine face usually has brows that sit at or above the superior orbital rim and form a nice arch. The nose can be slightly upturned, the mandible small, the lateral cheekbones prominent, and the lips volumized and well defined. The youthful face of a women is heart-shaped, with more volume superiorly in the temples and cheeks and less prominence of the mandible.

Injections to feminize a face can include BoNTA to the glabella to elevate the brow (see also Chapter 6 and Chapter 10), volumization of the temple (Chapter 50), and lower lid fillers to soften the lower lid–cheek junction. A square mandible can be softened by using BoNTA to the masseter (Chapter 24), and cheek bones elevated and accentuated (Chapter 54 and Chapter 55). Adding volume to and increasing the definition of the lips also feminizes the face (Chapter 42). BoNTA and HA can also be used in some patients to elevate the nasal tip (Chapter 13 and Chapter 51). A prominent nasal dorsal hump can be softened with fillers (Chapter 51).

Additional Reading

[1] de Maio M. Ethnic and gender considerations in the use of facial injectables: male patients. Plast Reconstr Surg. 2015; 136 (5) Suppl:40S–43S

[2] Wieczorek IT, Hibler BP, Rossi AM. Injectable cosmetic procedures for the male patient. J Drugs Dermatol. 2015; 14 (9):1043–1051

68
Management of Filler Injection Complications

Introduction

Fortunately, the most common complications from filler injections are minor and temporary, and may include swelling, bruising, and lumpiness. Rarely, more serious complications can occur, even in the best-trained hands. By having thorough knowledge of facial anatomy and understanding the filler properties, most serious complications can be avoided.

Tyndall Effect

Some hyaluronic acids (HAs) will refract blue light if placed too superficially or if they migrate superficially.

Treatment

A 20-gauge needle is used to puncture the pool of product, and the product is expressed through this tract. This is the preferred treatment for product in the lower face. Treatment of the lower lids with the puncture technique is difficult and can cause excessive bruising while trying to manipulate the product. In this region, 20 to 50 units of hyaluronidase (Vitrase, ISTA Pharmaceuticals, Irvine, California) can be used. Vitrase is sheep-derived (ovine) hyaluronidase supplied in 200 U/1 mL vials (20 units/0.1 mL). Other hyaluronidases include Hydase (PrimaPharm, Inc, distributed by Akorn Inc.), which has been FDA-approved as a "thimerosol-free," animal-derived hyaluronidase. Hylanex (Halozyme Therapeutics) was approved by the FDA in 2005 and is recombinant (rDNA) "human" hyaluronidase.

Herpetic Outbreak

When injections are placed in the lips, patients who have experienced prior herpetic outbreaks may have a flare-up of symptoms. Valtrex (500 mg) is typically started 3 days before injection and continued for 1 week afterward. More aggressive therapy with higher dosing and acyclovir creams is prescribed if herpetic eruptions occur despite prophylaxis.

Nodules/Lumpiness

Clumps of product may occur after injections. Massaging the product at the time of injection can lessen the occurrence of these lumps and bumps. Warm compresses and massage often help improve these lumps over time. Hyaluronidase can be used if HA lumps are unacceptable to the patient.

Granulomas

Granulomas are reactions to product that can be seen several months after injection. Granulomas may be treated with

Kenalog injections, oral methylprednisolone, and oral antibiotics. Some advocate using 5-fluorouracil (5-FU) for treatment. Excision is also an option.

Delayed Hypersensitivity

Erythema of the skin surrounding the injected product can be seen weeks to months after injection. It is theorized that biofilms play a role in this condition.

Treatment

Oral fluoroquinolones (ciprofloxacin, levofloxacin) or macrolides (clarithromycin or azithromycin) may be used for up to 6 weeks. Steroids and nonsteroidal anti-inflammatory drugs (NSAIDs) may encourage the formation of biofilms and should be avoided in these conditions. Injection of 5-FU may also be considered.

Vascular Compromise

Vascular compromise can be due to intravascular injection, vasospasm, or external compression. Immediate blanching of the skin is seen during injection.

Treatment

- Stop injection immediately.
- Massage the area.
- Apply warm compresses.
- Consider use of hyaluronidase (even if a calcium hydroxylapatite [CaHA] was used).
- Apply topical nitropaste.
- Prescribe aspirin by mouth.
- Follow the patient frequently; photodocument the injury and its progress.
- Consider consulting colleagues for assistance/advice.

Blindness

Blindness is a terrifying complication of nasal injections, and the best treatment is knowledge of the anatomy and injector expertise *before* any injections are performed. It is important to know the nasal vascular anatomy to both avoid important vessels and understand the mechanism for cases of ocular injury and blindness. Complications can arise from direct injury to the vessels, compression of vessels from surrounding over-injection, or intravascular embolization of product that travels retrograde into the ophthalmic vessels. The dorsal nasal artery, angular artery, and supratrochlear artery are connected to the ophthalmic artery. Intravascular injection into any of these terminal branches of the external carotid system can cause retrograde flow and embolization of the ophthalmic and retinal arteries.

Blindness due to filler injection emboli has been found to be irreversible in most cases. Should the patient complain of visual deficit during the injection, the injector should perform all the above-mentioned emergency maneuvers, seek immediate assistance from an ophthalmologist, and consider retrobulbar injection of hyaluronidase. Systemic steroids, antibiotics, and low-molecular-weight heparin should also be considered in management.

Fig. 68.1 (**a**) Blanching seen acutely at the time of vascular occlusion. (**b**) Purpura noted after facial artery occlusion. (**c**) Vascular injury from nonsurgical rhinoplasty in a postoperative patient. (**d**) Delayed hypersensitivity seen 6 months after HA injection. (**e**) Herpetic outbreak after filler injections to nasolabial folds. (**f**) Tyndall effect seen on the lower eyelids.

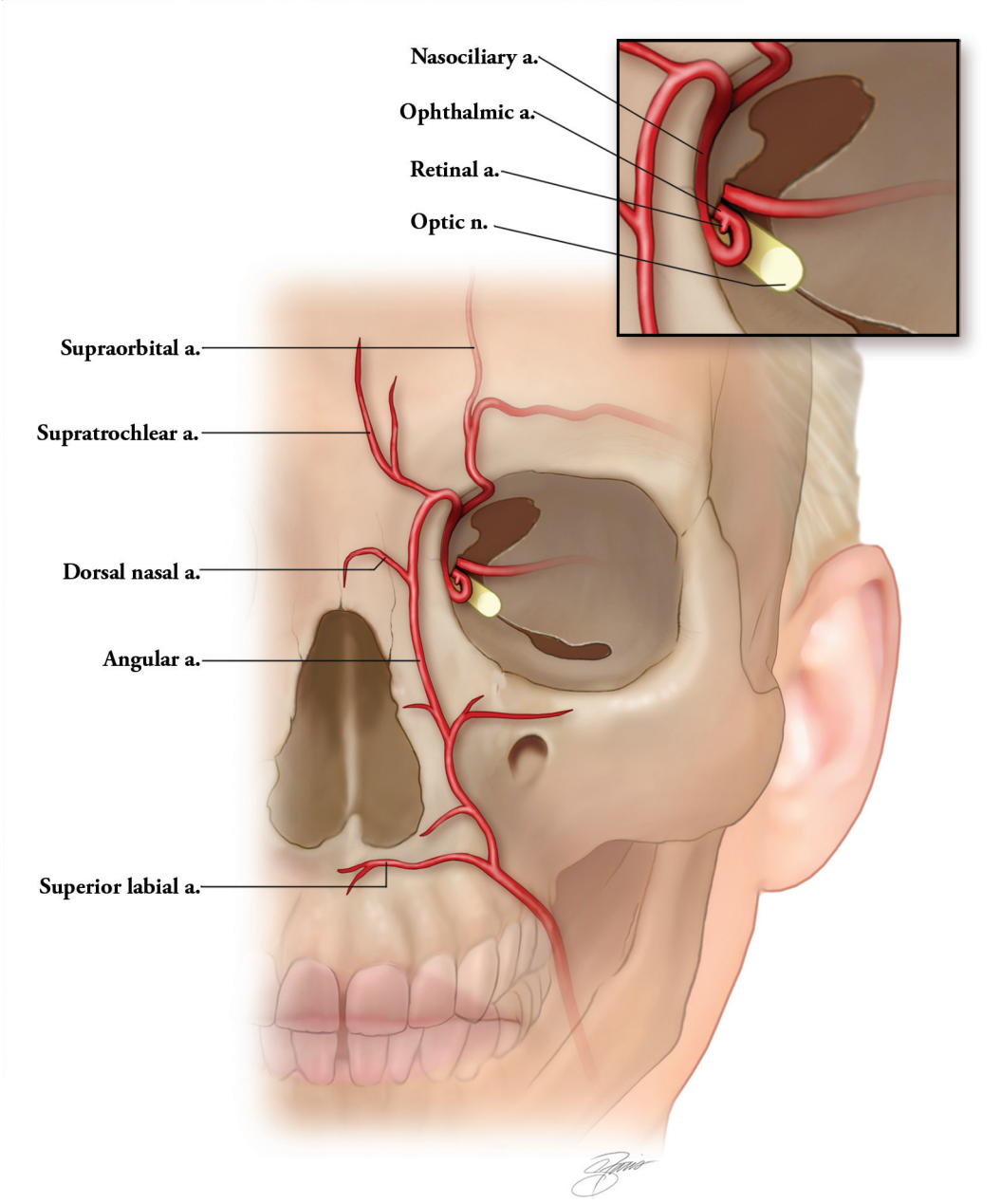


Fig. 68.2 The dorsal nasal artery, angular artery, and supratrochlear artery are connected to the ophthalmic artery. Intravascular injection into any of these terminal branches of the external carotid system can cause retrograde flow and embolization of the ophthalmic and retinal arteries.

Additional Reading

[1] Beleznay K, Carruthers JDA, Humphrey S, Jones D. Avoiding and treating blindness from fillers: a review of the world literature. Dermatol Surg. 2015; 41(10):1097–1117

[2] Dayan SH, Arkins JP, Brindise R. Soft tissue fillers and biofilms. Facial Plast Surg. 2011; 27(1):23–28

[3] Dayan SH, Arkins JP, Mathison CC. Management of impending necrosis associated with soft tissue filler injections. J Drugs Dermatol. 2011; 10(9):1007–1012

[4] Rzany B, Becker-Wegerich P, Bachmann F, Erdmann R, Wollina U. Hyaluronidase in the correction of hyaluronic acid-based fillers: a review and a recommendation for use. J Cosmet Dermatol. 2009; 8(4):317–323

[5] Scheuer JF , III, Sieber DA, Pezeshk RA, Gassman AA, Campbell CF, Rohrich RJ. Facial danger zones: techniques to maximize safety during soft-tissue filler injections. Plast Reconstr Surg. 2017; 139(5):1103–1108

[6] Urdiales-Gálvez F, Delgado NE, Figueiredo V, et al. Preventing the complications associated with the use of dermal fillers in facial aesthetic procedures: an expert group consensus report. Aesthetic Plast Surg. 2017; 41(3):667–677

[7] Woodward J, Khan T, Martin J. Facial filler complications. Facial Plast Surg Clin North Am. 2015; 23(4):447–458