

Sequential Lip Augmentation: Preventing Filler Migration through Staged Technique



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Abstract

Lip augmentation with dermal fillers has emerged as an important aesthetic procedure for enhancing facial harmony, restoring lip volume, and improving perioral aesthetics. Hyaluronic acid fillers are widely used because of their biocompatibility, reversibility, and ability to provide natural, dynamic enhancement. Filler migration remains a clinically important complication that may compromise lip symmetry and contour. A 32-year-old female with relatively thin lips and loss of vermillion border definition underwent sequential lip augmentation using a hyaluronic acid-based dermal filler. The first session involved conservative filler placement using linear threading and microbolus techniques, followed by assessment of filler integration and tissue response after 3–4 weeks. A second session involved selective filler placement to enhance projection and balance between the upper and lower lips. The sequential approach emphasizes controlled

volumization, appropriate injection depth and plane, and minimal tissue manipulation. A thorough understanding of lip anatomy, dynamic muscle activity, and individualized treatment planning is essential for minimizing migration and achieving predictable, natural-looking outcomes.

Keywords: Lip augmentation, hyaluronic acid filler, filler migration, staged technique, vermillion, Cupid's bow

Introduction

The lips constitute a highly specialized and functionally complex anatomical unit of the lower face, playing a central role in facial harmony, nonverbal communication, speech, and social interaction. Their morphology and mobility significantly influence perceived attractiveness, emotional expression, and psychosocial well-being. Characteristics such as symmetry, adequate volume,

and well-defined contours are commonly associated with youth, vitality, and health. Conversely, congenital disproportion or age-related structural changes may negatively affect self-perception, thereby contributing to the increasing demand for aesthetic lip interventions.^{1,2}

Anatomically, the lips consist of the upper and lower labia, each divided into cutaneous, vermilion, and mucosal regions. Aesthetic evaluation considers the lips within the perioral complex, extending from the nasolabial folds to the nasal base and from the commissures to the labiomental crease. The oral commissures anchor perioral muscles essential for expression, speech, and oral competence and functional stability. The upper lip contains key midline landmarks important for both function and aesthetics. The philtrum, defined by paired columns extending from the nasal septum to the vermilion, ends at the Cupid's bow and helps shape upper lip contour. These ridges arise from organized collagen and elastic fibers but gradually flatten with age. The double-curved Cupid's bow and central tubercle are principal aesthetic features. The vermilion border and white roll provide definition and procedural guidance, while the labial frenula ensure stability and mobility.¹

Histologically, the vermilion represents a specialized transition zone composed of thin, non-keratinized stratified squamous epithelium. It lacks hair follicles, sebaceous glands, and sweat glands, distinguishing it from adjacent cutaneous skin. Its characteristic coloration, ranging from pink

to brown depending on ethnic background, results from minimal melanocyte content and a dense superficial vascular plexus. The vermilion is subdivided into a dry (externally exposed) and a wet (internally oriented) mucosal surface, separated by the red line, which marks the transition to submucosal salivary glands and the angle of the orbicularis oris muscle.^{1,2}

Aesthetically, youthful lips are typically firm, well-hydrated, and proportionally voluminous, with clearly defined borders and harmonious projection. The aging process is associated with progressive thinning of the vermilion, blunting of the vermilion border, loss of philtral definition, and inferolateral descent of the oral commissures. These changes contribute to an aged facial appearance and may adversely affect self-confidence. Although cultural and ethnic factors influence aesthetic ideals, commonly referenced proportions include an upper-to-lower lip ratio of approximately 1:1.6 and a mild anterior projection of the upper lip relative to the lower, averaging 2 mm.^{1,2}

Patient motivations for lip enhancement vary according to age, gender, and cultural factors, with younger individuals often seeking subtle contour refinement, older patients prioritizing rejuvenation and perioral wrinkle correction, males favoring conservative volume restoration, and gender-diverse individuals requesting specific volumetric and contour modifications for gender-affirming care. Careful assessment is crucial to minimize procedural complications such as filler migration, which can

result from improper injection technique, high-volume or superficial placement, repetitive muscle activity, or excessive post-procedural manipulation. Migration may manifest as asymmetry, nodularity, or irregular lip contour, potentially compromising aesthetic outcomes and patient satisfaction. A thorough understanding of lip anatomy, injection planes, and dynamic function, coupled with meticulous procedural planning, is essential to prevent migration, optimize volumetric distribution, and achieve predictable, harmonious, and durable aesthetic results.

Patient Selection and Clinical Assessment

A 32-year-old female presented with concerns of relatively thin lips and loss of definition of the vermilion border. She desired a subtle, natural-looking lip enhancement without an overfilled appearance. Clinical examination revealed mild volume deficiency of both upper and lower lips with preserved symmetry and no prior history of filler injections. A sequential lip augmentation protocol was planned to minimize the risk of filler migration and ensure controlled volumization. A hyaluronic acid-based dermal filler was selected for its safety profile and reversibility.

Functional assessment of the perioral region is essential. Clinicians should evaluate dynamic muscle activity, smile symmetry, and lip behavior at rest and in motion, while noting perioral rhytids, marionette lines, and nasolabial folds. Variations in muscle dominance and repetitive movement influence filler placement, integration, and

durability. A thorough dental and skeletal evaluation is equally important, including incisor position, occlusion, alveolar support, and enamel wear, as these determine lip projection and balance. Structured frameworks such as the A.S.S.E.S.S. 4 protocol enable comprehensive facial analysis. Standardized photography, three-dimensional imaging, and high-frequency ultrasound further refine planning by improving anatomical visualization and risk assessment.^{3,4}

Treatment Protocol

Patient Assessment and Preparation

Prior to the procedure, a comprehensive evaluation of the perioral region should be conducted, including assessment of lip morphology at rest and during dynamic movements, vermilion height, symmetry, tissue quality, and overall facial proportions. Detailed medical and aesthetic history, including prior filler treatments or lip surgeries, should be obtained to identify contraindications such as active infection, recent herpes labialis, or significant lip scarring. Patients should be informed regarding the risks, benefits, and post-procedure care requirements, and written informed consent should be obtained.⁵

The perioral area is prepared with an appropriate antiseptic solution to reduce the risk of infection. Local anesthesia is administered using an intraoral block with a low-volume anesthetic, such as prilocaine, injected into the mucobuccal fold to ensure adequate analgesia while minimizing tissue distortion and swelling. This approach

allows accurate filler placement without compromising the natural contours of the lips.^{5,6}

Filler Selection

A high-viscosity, cohesive hyaluronic acid filler with incorporated lidocaine is recommended to maintain stability within the tissue and reduce migration risk. The filler should be chosen based on desired volumization, tissue support, and patient-specific anatomical considerations.^{5,6}

Procedure

Hyaluronic acid filler is injected at predetermined anatomical points using a fine-gauge needle, with careful attention to injection depth, plane, and volume, often employing a retrograde linear threading technique. Injections are performed gradually in small boluses, and gentle molding ensures even distribution while avoiding excessive manipulation to prevent migration. A cold compress may be applied to reduce post-procedural edema, and patients are advised to avoid vigorous lip movements, massaging, or heat exposure. Follow-up assessment evaluates symmetry, volume, and aesthetic outcome, with touch-ups scheduled as needed, optimizing safety, comfort, and predictable results.^{5,6}

Sequential Injection Technique

Initial Bolus Placement

A small initial deposit of filler is placed at the central aspect of the upper vermilion using a linear threading technique to establish the primary volumetric foundation. This ensures that subsequent filler placement follows the natural vector of the lip and reduces lateral spread.⁷

Top-to-Bottom Linear Threading

The needle is oriented from the upper vermilion border towards the mucosal surface, following the natural top-to-bottom vector of the lip tissue. Linear threading is performed slowly, with careful withdrawal of the needle while injecting small aliquots of filler to create a uniform distribution and avoid overfilling in any one area.⁷

Sequential Lateral Distribution

After central deposition, additional filler is placed sequentially along the lateral aspects of the upper lip, maintaining the same top-to-bottom vector. This approach prevents displacement toward the cutaneous lip, preserves the Cupid's bow contour, and supports symmetrical tissue expansion.⁷

Vermilion Border Definition

Superficial filler placement is performed along the vermilion border to enhance lip contour and define the Cupid's bow, avoiding deep intramuscular injection. Careful attention is given to maintaining a submucosal plane, as deep placement may predispose to migration or compromise lip mobility.⁷

Final Contouring and Massage

Gentle molding of the filler is performed using minimal pressure to achieve a smooth, symmetrical appearance. Post-procedure massage should be limited to prevent unwanted filler displacement. Patients are advised to avoid vigorous lip movements, heat exposure, and manipulation of the treated area during the initial 24–48 hours.⁷

Follow-Up and Outcome Assessment

In the first session, a conservative

volume of filler was injected using a combination of linear threading and microbolus techniques targeting the vermillion border and lip body. The focus was on structural support and contour definition rather than maximal volumization. The patient was reviewed after 3–4 weeks to assess integration of the filler and tissue response.

During the second session, additional filler was placed selectively to enhance projection and balance between the upper and lower lips. Care was taken to respect anatomical boundaries and maintain a natural lip ratio. Post-procedure instructions included avoidance of excessive lip manipulation and application of cold compresses to reduce swelling.

Patients should be observed for immediate complications such as

vascular compromise, bruising, or edema. Follow-up evaluation is recommended to assess filler stability, lip symmetry, and patient satisfaction. Sequential top-to-bottom injection vectors, coupled with careful volumetric control and minimal tissue manipulation, have been shown to reduce filler migration toward the cutaneous upper lip while optimizing aesthetic outcomes.⁷

Clinical outcome/results

First session



Figure 1 (a,b,c): First session of sequential lip augmentation showing conservative HA filler placement along the vermillion border and lip body for structural support and contour definition.

Second session



Figure 2 (a,b,c): Second session of sequential lip augmentation with selective HA filler placement to enhance projection and achieve balanced, natural lip contours.

Discussion

Lip augmentation with dermal fillers has emerged as a cornerstone in aesthetic medicine, primarily due to its capacity to enhance facial harmony, restore youthful lip volume, and improve overall perioral aesthetics. The lips serve as a central feature of the face, contributing to expressions, symmetry, and individual identity, and changes in

their morphology can significantly influence perceived age and attractiveness. Age-related factors, including cumulative sun exposure, intrinsic tissue aging, genetic predisposition, and lifestyle influences, often lead to

diminished lip volume, decreased elasticity, fine line formation, and blurring of the vermilion border, resulting in an aged or fatigued appearance.⁸

Hyaluronic acid (HA) fillers have become the treatment of choice for lip augmentation owing to their biocompatibility, reversibility, and capacity to provide natural, dynamic enhancements. HA, a naturally occurring glycosaminoglycan, exhibits strong hygroscopic properties, allowing it to attract and retain water, which not only restores volume but also improves hydration and texture of the treated tissue. The pliable gel consistency of HA closely mimics native lip tissue, supporting subtle contouring while preserving functional mobility, and the availability of hyaluronidase allows for safe correction in cases of overcorrection or adverse events. Advances in injection techniques, particularly the adoption of micro-cannulas and precision needles, have minimized trauma, reduced bruising and swelling, and improved filler placement accuracy, thereby optimizing outcomes while reducing procedural discomfort. Careful patient selection, including assessment of medical history, skin integrity, allergy profile, and concomitant medication use, is essential to minimize risks, particularly in patients with active dermatologic lesions, bleeding disorders, or those on anticoagulant therapy. Additional precautions include delaying treatment in cases of active infections or inflammatory skin conditions, and counseling regarding the avoidance of NSAIDs, high-dose vitamin E, and other agents that may

increase bleeding risk in the periprocedural period.⁹

Patient-specific lip anatomy guides a tailored approach to augmentation. Normal-volume lips with adequate baseline definition may require conservative volumization focused on the vermilion, typically not exceeding 1–1.5 mL per session, with follow-up assessments for incremental enhancement. Thin lips, whether hereditary or acquired, necessitate staged injections to respect tissue expansion capacity, with initial augmentation of 0.5–1 mL followed by additional sessions at 30-day intervals until optimal volume and symmetry are achieved, with subsequent refinement of lip borders. Aged lips with significant volume loss, elongation, perioral rhytides, and effacement of the vermilion border require a gradual, multi-session approach prioritizing volume restoration before definition, while addressing perioral lines to achieve a natural rejuvenated appearance. Throughout all procedures, vigilance for intravascular injection is critical; immediate recognition of blanching, disproportionate pain, or tissue ischemia necessitates prompt intervention with hyaluronidase, warm compresses, and supportive measures to restore perfusion.¹⁰

Among potential adverse events, filler migration represents a less frequent but clinically important complication that may compromise lip symmetry and aesthetics. Migration can manifest weeks to months post-injection as asymmetry, nodularity, lump formation, or irregular contouring.

Mechanisms include improper injection technique, high-volume or high-pressure bolus administration, superficial placement outside intended tissue planes, excessive post-procedural massage, repetitive orbicularis oris muscle activity, gravitational displacement, and vascular or lymphatic transport of filler material. Sequential, small-volume injections with attention to anatomical planes and dynamic muscular function are critical in minimizing migration, allowing controlled volumization while preserving natural lip movement. Migration may occasionally provoke localized inflammatory responses or granulomatous reactions, particularly with permanent fillers, whereas HA fillers carry a lower risk due to their resorbable nature and can be safely corrected with intralesional hyaluronidase. The risk of migration is influenced by anatomical factors, including the thin vermilion, variations in tissue thickness, and orbicularis oris muscle activity, which may predispose certain regions to displacement. Accurate diagnosis relies on comprehensive history, careful clinical examination, and imaging modalities such as high-frequency ultrasound, which facilitates localization and characterization of the filler, and in select cases, magnetic resonance imaging may further delineate filler type and tissue involvement.¹¹

Prevention of migration and other complications is grounded in meticulous procedural planning, staged volumetric augmentation, precise depth and plane selection, and thorough knowledge of perioral anatomy and function. Early

recognition and intervention are essential to correct unwanted effects, restore symmetry, and maintain patient safety. Patient education regarding realistic outcomes, staged treatment expectations, and adherence to post-procedural precautions further contributes to optimal satisfaction.¹²

Overall, lip fillers, particularly HA-based products, provide a safe, effective, and minimally invasive option for aesthetic enhancement, and when administered with attention to anatomical detail, staged technique, and individualized patient needs, they yield predictable, natural, and durable results while minimizing the risk of complications, including filler migration.

Conclusion

Sequential filler administration in the lips allows precise, controlled volumization and contouring

while preserving symmetry and natural function. By using small, staged injections along anatomical vectors of the vermilion, Cupid's bow, and perioral musculature, risks of migration, asymmetry, and vascular compromise are minimized. Careful assessment of lip morphology, tissue quality, and dynamic muscle activity enables individualized treatment that restores volume, defines borders, and addresses perioral rhytides. This method ensures predictable, harmonious, and functional aesthetic outcomes with minimal complications.

Declarations

Patient Consent

Written informed consent was obtained from the patient for the lip augmentation procedure and for publication of the accompanying clinical photographs.

Conflict of Interest

The author declares no conflict of interest.

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Author Contributions

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Ethics Approval

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