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EXPERT OPINION

Expert Consensus on Injection Technique and Area-Specific Recommendations for the Hyaluronic Acid Dermal Filler VYC-12L to Treat Fine Cutaneous Lines

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Background: VYC-12L is a hyaluronic acid (HA) injectable gel designed to treat fine cutaneous lines and improve skin quality attributes such as hydration and elasticity.

Objective: Expert consensus was sought on VYC-12L injection technique and primary treatment target areas.

Methods: A multinational group of aesthetic medicine clinicians (n = 128) attended product training and each identified ~10 patients for VYC-12L. After treating their first and last patients, the clinicians completed a survey on preferred injection methodology/technique, including injection angle, volume, and spacing. An expert panel (n = 12) discussed survey results and their clinical experiences to obtain consensus on VYC-12L technique and appropriate treatment areas.

Results: Recommendations included micro-depot injections of VYC-12L into the deep dermis with a 32G $\frac{1}{2}$ inch needle inserted at <45° to the skin, spaced 0.5–1.0 cm apart, with 0.01-0.05 mL volume per injection (full-face total volume: ~2 mL). Recommended primary treatment areas were the malar, perioral, neck, and décolletage regions. Injection techniques for different treatment areas/demographic characteristics were similar, with some variability in treatment approach. Patient selection criteria, pre- and post-treatment guidelines, and managing patient expectations are important components of treatment.

Conclusion: These consensus recommendations may assist clinicians in optimizing the treatment of fine lines with VYC-12L.

Keywords: consensus, hyaluronic acid, injectable dermal filler, dermis, skin aging, Juvéderm Volite

Introduction

The topographic appearance of facial skin can influence judgments of age, physical health and fitness, and psychological factors such as self-esteem and well-being.¹⁻⁴ Skin smoothness, hydration, firmness, and texture are just a few of the attributes that contribute to overall skin appearance or skin quality.^{5–9} Poor skin quality results from a variety of intrinsic and extrinsic factors, such as age- and hormone-related structural changes and environmental stressors (eg, ultraviolet, infrared A, and ozone exposure); effects on the skin may include roughness, surface irregularities, and wrinkling.^{6,10–15} Minimally invasive cosmetic procedures to improve skin appearance, such as chemical peels, laser skin resurfacing, and microdermabrasion, have increased in popularity over the last 2 decades, exceeding 3.1 million procedures in the United States in 2017.^{16,17}

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VYC-12 with lidocaine (VYC-12L [Juvéderm Volite]; Allergan plc, Dublin, Ireland) is a crosslinked HA injectable gel that was developed using the Vycross technology platform (Allergan plc, Dublin, Ireland) and was designed to treat superficial cutaneous depressions such as fine lines and to improve skin quality attributes such as hydration and elasticity.¹⁸ A prospective, single-center, single-arm study in 131 subjects with moderate to severe cheek skin roughness at baseline showed that a single treatment with VYC-12 without lidocaine was safe and effective for reducing skin roughness and fine lines up to 6 months and improving skin hydration up to 9 months.¹⁹ Most subjects (76.4-90.8%) reported significant improvements in satisfaction with skin at all time points through month 9 on the FACE-Q Satisfaction With Skin scale, a validated patientreported outcome measure, and more than 80% said they would recommend the treatment to a friend.²⁰ A prospective, open-label, 2-center study also demonstrated that VYC-12 improved skin quality and texture for up to 6 months, based on both objective and subjective analysis methods, in 40 women aged 35 to 60 years presenting with facial lines, low skin hydration or brightness, and signs of chrono- or photoaging.²¹ This article provides consensusbased guidance and direction on VYC-12L injection technique, ideal treatment areas, and pre- and post-treatment management based on clinical experiences of aesthetic medicine clinicians and the author group.

Consensus Methodology Experience Phase

A multinational group of 128 European aesthetic medicine clinicians participated in an initiative to gather real-world clinical experience on the use of VYC-12L. After attending a product training event, participants identified approximately 10 patient candidates for VYC-12L treatment. The clinicians each completed a survey after treating their first and last patients. The clinicians were asked to indicate their preferred injection methodology, including technique, depth and angle of injection, volume per injection, and spacing between injection sites; primary target areas of treatment; and pre- and post-injection advice. Survey questions and results from the experience phase are summarized in the Supplemental Table.

Consensus Phase

An expert panel of 12 international advisors convened in Paris, France, in January 2017 and reviewed the results of the survey (Supplemental Table). The advisors were selected and invited by Allergan to participate in this initiative based on their positive reputation in the aesthetic community and extensive clinical practice and/or clinical trial experience with VYC-12L. During the meeting, the advisors discussed their individual experiences using VYC-12L and established consensus on general injection technique; area-specific recommendations for the forehead, malar, perioral, neck, hands, and décolletage regions; and pre- and post-treatment management.

Consensus Recommendations Injection Technique

Key recommendations for VYC-12L injection technique were to use micro-depot injections, inject into the deep dermis at an angle less than 45 degrees from the skin surface, and space injections approximately 0.5 to 1.0 cm apart (Table 1).^{22–25} The depth and spacing of the injection may be individualized to the patient and the treatment area based on the severity level of the skin lines, roughness, and photodamage.

Anatomical Region

The malar, perioral, neck, and décolletage regions were identified as primary target areas for VYC-12L treatment with area-specific injection techniques based on skin characteristics in the respective regions (Table 2).

The panel did not identify the forehead as a primary indication for injection in otherwise treatment-naïve patients. Forehead skin has different sebaceous properties than the other areas identified for treatment; specifically, greater sebum production in the forehead results in increased skin surface hydration and a better skin appearance. Further, patient concerns about the forehead generally relate to dynamic lines, typically addressed with a neuromodulator.^{22,26,27} However, clinical data have demonstrated the efficacy and safety of VYC-12 without lidocaine for the treatment of forehead lines, and there is clinical practice experience in this facial area.

The dorsum of the hands was not considered a primary target for VYC-12L treatment; visible or protruding tendons or veins in the hands would be best addressed by other HA-based products with greater lift capacity,²⁸ such as VYC-17.5L (Juvéderm Vollure XC/Juvéderm Volift XC; Allergan plc, Dublin, Ireland). Based on the clinical experience of some members of the panel, however, VYC-12L may be used to improve the appearance of the skin on the hands without producing an excessive volumizing effect.

General Recommendations		
Technique	Micro-depot	
Needle	 Use 32G 1/2 inch needle provided with product (larger needles, such as 30G, will make small- volume dosing more difficult) Do not use a cannula, which cannot deliver into deep dermis Blunting of needle may occur with repeated injections; may need to use 2–4 needles per syringe 	
Angle	• <45° between needle and skin	
Depth	 Target deep dermis; injection is too superficial if tip of needle is visible and skin whitens during injection Injecting too deeply is preferable to injecting too superficially because overly superficial injections may cause skin surface irregularities^{22,23} Immediately mold/massage for 10 mins any areas that were unintentionally too superficially injected Author experience suggests that initial surface irregularities with VYC-12L will settle within a day Areas with greater photodamage may require deeper injections, but care must be taken to avoid increased bruising Be attentive to differences in skin thickness across injection sites; for example, neck skin tends to be thinner, but solar elastosis may cause thickened dermal layer^{24,25} 	
Spacing of injections	 0.5–1.0 cm To guide spacing, use standardized grid or pattern individualized to patient Adapt spacing to patient or facial area or to target specific lines; spacing may be wider in younger patients or those with less severe skin roughness/ fine lines whereas spacing may be more narrow in areas with more severe skin roughness/fine lines 	
Volume	 0.01-0.05 mL per injection Accurate delivery of 0.01-0.05 mL may be difficult with the gradations provided on the syringe but will improve with training/practice Total volume of ~2 mL is typically required for the full face, excluding the forehead Slightly greater total volume (≤2.5 mL) may be needed for more severe photodamage or when the neck and décolletage are included in treatment 	

Table IExpertPanelConsensusOnVYC-12LInjectionTechnique

Pre- and Post-treatment Management

Specific recommendations for both patients and clinicians to observe before and after treatment with VYC-12L (Table 3)²⁹ are largely consistent with pre- and post-

Area-Specific Recommendations*		
Malar region	 Initially, use grid for spacing, then target specific areas of concern (eg, radial cheek lines or fine radial lip lines) Begin injections laterally and progress medially Lateral areas may require less volume because the skin is thinner and less visible than in medial areas; these less visible areas also allow for gaining familiarity with the skin To increase patient comfort in sensitive patients, diffuse anesthetic from the lateral region as injections progress 	
Perioral region	• Sensitive patients may require additional anesthesia	
Neck	 Target specific areas of concern as needed (eg, horizontal neck lines) Stretch skin while injecting to help clarify depth of injection and to reduce injection discomfort and bruising If injections are too superficial, "cobblestoning" may occur; either massage the area for 10 mins with a cotton swab or use fingers to squeeze the nodules to help disperse these lumps Neck may be more prone to complications and bruising because of increased vascularity Volume per injection should be the smallest injectable aliquot (~0.05 mL), and total volume should be ~1 mL Do not treat if patient is extremely thin 	
Décolletage	• Stretch skin to help clarify depth of injection	

Note: *Follow general recommendations (Table 1) for each area.

treatment guidance for other HA-based dermal fillers.^{23,30,31} Specific training on the use of VYC-12L is essential in order to avoid potential side effects associated with HA dermal fillers.

Demographic-Based Treatment Considerations

Improvements in skin appearance with VYC-12L treatment are expected regardless of age, skin phototype, and ethnicity (Table 4).^{32–36} However, there are specific considerations for treatment with VYC-12L in each group. For example, older individuals whose skin is highly damaged may require more volume or closely spaced injections compared with younger individuals. Further, VYC-12L would not typically be the first aesthetic simplex virus²⁹

Pretreatment	Post-treatment	Pre-/Post-treatment	
Patient should:	Patient should:	Patient should:	
Avoid use of makeup and/or cosmeceuticals	• Avoid direct sun,	Avoid nonsterile topical agents	
 Avoid NSAID or aspirin intake within 7–10 days of 	sunbeds, or saunas for 2	 Increase water intake for 48 hrs 	
treatment or as approved by treating physician	weeks	 Avoid aspirin, NSAIDs, medications, or 	
 Avoid alcoholic beverage intake the night before 	 Use sunblock 	supplements that affect coagulation time (eg, herbal	
 Increase water intake 	 Avoid makeup for 12 hrs 	supplements with garlic and ginkgo biloba)	
Clinician should:	•Avoid exercise for 24 hrs	•Avoid microneedling, peels, or laser treatments for 2	
Obtain patient consent for procedure	 Avoid radiofrequency 	-4 weeks	
 Warn patients of risks associated with the 	procedures for 2 weeks	 Apply disinfecting cream (eg, Fucidin cream) 	
procedure, such as inflammatory skin reactions and	 Expect limited downtime 	 Apply sunblock daily 	
bruising	 Massage nondispersed 	 Avoid dental procedures for 2–4 weeks 	
• Educate patients on realistic expectations for	filler (bumps/cobblestones) if		
treatment, emphasizing tangible, long-lasting effects on	visible after 10 days		
overall skin appearance and improved moisture retention	Clinician should:		
vs instant visibility of results	• Perform vibration		
 Clean skin with antiseptic 	massage on treated areas		
• Apply topical anesthetic, cold compress/ice pack, or	before patient leaves clinic		
contact cooling device to target areas, especially to	 Apply anesthetic cream, 		
sensitive areas such as the neck or perioral region, to	if necessary		
make injections more comfortable and minimize bruising,			
for up to 30–45 mins before injection according to			
patient sensitivity			
• Prescribe antiviral prophylaxis several days prior to			
treatment in patients with a history of facial herpes			
22	1		

Abbreviation: NSAID, nonsteroidal anti-inflammatory drug.

Table 4 Demographic-Based Treatment Considerations

Sex	 Males and females require similar injection depth in target areas Males may require a lower total volume of VYC-12L for the face because of wider injection spacing in the male beard area Strong scaffold of terminal hair makes skin in this area physiologically different and less prone to skin-quality issues than the same area in females³²
Skin phototype and ethnicity	 Recommended injection techniques do not differ Injection angle may need to be adjusted in Asian patients because Asian skin is thicker than Caucasian skin,³³ but Asian patients' response to treatment will likely be positive and durable, possibly because of heightened barrier function in the skin³³⁻³⁶ Benefits of VYC-12L treatment comprise both visual improvements in skin roughness and fine lines and tangible improvements in hydration and texture; the visual effects may be harder to see in darker skin, but all ethnic skin types are expected to have equally palpable improvements in skin quality, including improved moisture retention
Age	 Recommended injection techniques do not differ Patients in all age groups can benefit from VYC-12L treatment; it has a versatile effect on overall skin quality regardless of the severity of extrinsic or intrinsic damage Some older patients may need a multimodal treatment approach to address their skin quality concerns, in contrast to young patients who may require only VYC-12L; for example, older patients might combine treatment with VYC-12L in the neck or décolletage with a volumizing treatment in the face Older and more damaged skin may require more volume and closely spaced injections Older skin may be thinner due to atrophy, and skin stretching may make needle penetration into the deep dermis easier

Table 5 Recommendations for Selecting Patients

Selection Criteria

- Patients with first signs of aging, low-grade acne scars, or dry, rough, or flaky skin and who have realistic expectations for treatment with VYC-12L
- Patients who do not show signs of active skin infection/inflammation (eg, acne, herpes, common warts, etc.)^{18,38} in the areas to be treated
- Younger patients with photodamage and concerns about skin appearance
- Older patients who have had initial aesthetic treatments with neurotoxins or volumizers
- Patients with minimal sagging of the neck skin
- Patients with mild photodamage in the décolletage area

treatment for older patients, who may have previously received neuromodulating or volumizing treatments, or may have undergone cosmetic procedures that involve greater downtime, such as laser skin resurfacing.³⁷ Therefore, older patients (or patients with a previous history of aesthetic and/or cosmetic procedures) should be advised that VYC-12L involves minimal downtime in addition to other distinguishing treatment considerations.

Patient Selection

A broad range of patients are appropriate for VYC-12L treatment (Table 5).^{18,38} Younger patients who have sun damage or concerns about the texture or lackluster appearance of their skin may be good candidates for VYC-12L as an early or initial aesthetic treatment. Based on personal observation, the panel commented that skin with low-grade acne scars also responds well to VYC-12L.

Patient Expectations

In setting appropriate treatment expectations, patients may be counseled to expect visible results approximately 5 to 10 days after treatment, rather than immediately, and to experience effects for about 4 to 6 months. Increased, prolonged internal cutaneous moisturization was identified as a major driver of patient satisfaction with VYC-12L, and it was recommended that patient management and communication efforts emphasize such tangible effects more than the instant visibility of results. Clinicians might communicate anticipated results to patients using words such as *luminosity, radiance, glow,* and *freshness*, which may be easier for patients to visualize than *improved skin quality.* Clinicians may also share with patients that improvements in horizontal neck lines and décolletage skin may be particularly satisfying, as these results, in the opinion of the panel, may last the longest. Patients should also be made aware that some skin characteristics, such as uneven pigment and large pores, will not improve significantly.

Representative images of results before and after treatment with VYC-12L are presented in Figures 1–4. These figures demonstrate the effectiveness of VYC-12L for fine lines and skin appearance at 1-month post-treatment in patients who had no prior experience with the product.

Role of VYC-12L in an Aesthetic Treatment Plan

Treatment with VYC-12L may be performed in the same session as injection of neurotoxins or other facial rejuvenation procedures. For example, a study conducted in 45



Figure I Representative images of facial area (A) before treatment and (B) I month after injection of VYC-12L into cheek, jawline, and perioral area, 1.0 mL per side. Images courtesy of Jesper Thulesen, MD.



Figure 2 Representative images of décolletage (A) before treatment and (B) I month after I.5-mL injection of VYC-12L. Images courtesy of Patricia Ogilvie, MD.



Figure 3 Representative images of neck (A) before treatment and (B) I month after 1.0-mL injection of VYC-12L. Images courtesy of Patricia Ogilvie, MD.



Figure 4 Representative images of cheek (A) before treatment, (B) I month after initial injection of VYC-12L, 0.5 mL per side, and (C) 2 weeks after second treatment with VYC-12L, 0.5 mL per side. Images courtesy of Izolda Heydenrych, MD.

patients aged 35 to 52 years demonstrated high patient satisfaction and multiple skin quality and texture improvements, including smoothness, brightness, hydration, elasticity, and tightness, when VYC-12L was combined with microinjections of onabotulinumtoxinA and fractional resurfacing laser treatments.³⁹ However, the initial treatment with VYC-12L in the face may be best administered without facial volumizing treatments in the same session. This approach will allow the injector to gain experience with VYC-12L and its distinct effects on a patient's skin independent of any changes in skin appearance resulting directly from the volumizer. It may be appropriate to combine VYC-12L and volumizing treatment in the face once clinical experience has been gained and clear expectations of the results of this combination can be determined. The use of VYC-12L in the neck or décolletage during the same session as a facial volumizing treatment is supported, because these treatment areas are distant from the face and results are more likely to be complementary.

Conclusions

These consensus recommendations provide important information to guide clinicians in the use of VYC-12L. They support clinicians in optimizing aesthetic outcomes for patients who are seeking enhancement of their skin appearance, whether because of extrinsic effects, such as photodamage, or intrinsic changes, such as skin aging. The expert panel concluded that VYC-12L is especially appropriate for treatment of the malar, perioral, neck, and décolletage regions using the same general injection technique, with some modifications based on region-specific skin and patient characteristics. Patients may expect skin appearance improvements with VYC-12L regardless of their age, sex, or ethnicity. VYC-12L can be part of a comprehensive aesthetic treatment plan for patients of any age.

VYC-12L has several features that differentiate it from other treatments intended to improve the appearance of the skin. For example, topical retinoids,^{40,41} photodynamic therapy,⁴² chemical peels,^{8,43} laser skin resurfacing,³⁷ and nonablative skin rejuvenation devices⁴⁴ are applied to the surface of the skin, whereas VYC-12L is injected intradermally, with the objective being long-term improvements in skin appearance.¹⁸ Treatment with injectable HA-based fillers has been shown to temporarily improve attributes of skin quality, by hydrating the dermis and stabilizing the structure of the extracellular matrix–supporting fibroblasts.^{45,46}

Unlike targeted volumizing treatments, VYC-12L treatment involves covering the whole topographical area with evenly spaced intradermal injections followed by targeted injections to correct lines, depressions, and other modalities of concern in the skin. VYC-12L also requires strategic and systematic intradermal injections, unlike mesotherapy, which consists of random microinjections of noncrosslinked HA, vitamins, minerals, and amino acids into the superficial part of the dermis.^{27,47,48}

Setting patient expectations is an important component of treatment with VYC-12L. VYC-12L is a reasonable option for patients who want more subtle improvements in the appearance of their skin. To this end, physician-patient communication is key; patient education should be focused on the palpable, rather than instantly visible, effects of the treatment (eg, increased, prolonged moisturization). As with other aesthetic treatment options, high-quality, standardized, and reproducible medical photography showing patients' skin before and after treatment may be useful in helping patients to detect and appreciate the effects of treatment with VYC-12L.

Prior Presentation

A poster based on this paper was presented at the 13th Aesthetic and Anti-aging Medicine European Congress, September 15–17, 2017, Monte Carlo, Monaco. The poster's abstract was made available to meeting attendees in the congress' on-site abstract book.

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