



ORIGINAL ARTICLE

An expert consensus report on the clinical use of the Vycross[®] hyaluronic acid VYC-25 L filler

María A. Segurado MD^{1,2}  | Fernando Urdiales-Gálvez MD³  | Paula A. Benítez MD⁴ | Sara Carrasco MD⁵ | Iratxe Díaz MD⁶ | Nuria Escoda MD⁷ | Lisandro Farollch-Prats MD⁸ | Vitor Figueiredo MD⁹ | Francisco Ortíz MD¹⁰ | María Consuelo Sebastián MD¹¹ | Luís Uva MD¹²

¹SClinic, Madrid, Spain

²Francisco Vitoria University, Madrid, Spain

³Instituto Médico Miramar, Madrid, Spain

⁴Clínica ROBEGA, Madrid, Spain

⁵Grupo Dra. Sara Carrasco - Dermatología Integral, Bilbao, Vizcaya, Spain

⁶Clínica Iratxe Díaz, Bilbao, Vizcaya, Spain

⁷Clínica Nuria Escoda, Barcelona, Spain

⁸Nu Clinic, Barcelona, Spain

⁹Up Clinic, Lisbon, Portugal

¹⁰Clínica del Dr Ortíz, Sevilla, Spain

¹¹Clínica Sebastián, Valencia, Spain

¹²Clínica Personal Derma, Lisbon, Portugal

Correspondence

María A. Segurado, SClinic, Calle de Lagasca 18, Madrid 28001, Spain.
Email: sclinic@sclinic.es

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Allergan

Abstract

Background: The portfolio of hyaluronic acid (HA) fillers and the techniques of administration have evolved in recent years. The latest innovation in the Vycross[®] range was the introduction of VYC-25L (Juvéderm Volux[®]; Allergan plc), a first-in-class filler effective for chin and facial lower third remodeling. The aim here was to provide clinicians who are starting to use VYC-25L with key advice, and to standardize procedures so that optimal and predictable outcomes can be obtained.

Methods: A multidisciplinary group of experts in esthetic medicine from Spain and Portugal reviewed the properties, treatment paradigms, administration techniques, and potential complications of VYC-25L, on the basis of which they drafted consensus recommendations for its clinical use.

Results: The consensus panel provided specific recommendations focusing on the patient profile, dose, administration techniques, and the complications of VYC-25L and their management. The panel identified five different profiles of patients who may benefit from VYC-25L, and they drafted recommendations aimed to facilitate the treatment of these patients, namely, microgenia (women/men), masculinization (men), rejuvenation (women/men), facial laxity (women/men), and submental convexity (women/men). In terms of their safety, no specific recommendations were made beyond those established for other HA fillers.

Conclusions: The evolution of esthetic medicine makes it necessary to update the clinical recommendations that guide patient assessment and treatment with the new HA fillers developed. The current consensus document addresses relevant issues related to the use of VYC-25L on different types of patient, in an attempt to standardize procedures and help specialists obtain predictable results.

KEYWORDS

facial rejuvenation, hyaluronic acid, myomodulation, Vyc-25L, Vycross

Segurado and Urdiales-Gálvez contributed equally to this work and should be considered equivalent first authors.

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1 | INTRODUCTION

Esthetic medicine is continuously evolving, providing specialists with constant challenges. The development of new classes of products, new indications and procedures, and the evolution of treatment paradigms, in conjunction with a better understanding of facial anatomy and its aging, make it necessary to adopt more comprehensive approaches to facial rejuvenation, and to update guidelines.

Over the past few years, the number of minimally invasive esthetic procedures has increased dramatically.¹ Based on a survey conducted by the International Society of Aesthetic Plastic Surgery, more than 13.6 million non-surgical procedures were performed worldwide in 2019.¹ Moreover, more than 4.3 million of minimally invasive hyaluronic acid (HA) esthetic procedures were performed that year, representing an increase of 15.7% from 2018.¹

Hyaluronic acid fillers are mainly used to fill rhytides and folds, or to restore/correct soft tissue loss caused by either disease or aging.²⁻⁴ HA is a high molecular weight, natural, and linear glycosaminoglycan that is present in all mammals.^{5,6} Due to its physicochemical properties, HA is one of the most hygroscopic molecules in nature and hydrated HA can contain up to 1000-fold more water than its own weight.⁷ Some specific features of HA influence its properties as a filler, such as polymer chain length, HA concentration, degree of cross-linking, or the cross-linking technology used, which affect its duration, extrusion force, and elastic Modulus (G'). These phenomena define the distinct products and the indications for which they may be employed.^{6,8-12}

One of the most recent generation of fillers was created using the patented Vycross® technology (Allergan, Inc.), which utilizes a proprietary mixture of high and lower molecular weight HA.¹³ VYC-25L (Juvéderm Volux®; Allergan plc) represents the latest innovation in the Vycross® range, combining high G' (resistance to deformation) and high cohesivity HA,¹⁴ properties that make it an ideal filler to create and restore facial volume. In clinical practice, VYC-25L has been successfully used to restore and create facial volume in patients with chin retrusion^{15,16} and for other esthetic indications.¹⁷ Moreover, when used for chin augmentation in patients with chin retrusion, its effects persist for at least 18 months.¹⁶

It is not only effectiveness but also the safety of new HA products that must be considered. Thus, it is particularly important to study the bio-integration and tolerability of HA fillers after their injection.¹⁸ Tissue bio-integration of VYC-25L was assessed recently in a prospective, non-comparative, open-label, and multicenter study carried out on subjects who underwent facial rejuvenation treatment of the lower third of the face.¹⁹ According to this study, partial bio-integration of VYC-25L was evident 48 h after treatment and the HA had fully integrated into the tissue 30 days after injection.

Although we have data from clinical studies about the good efficacy and safety profile of VYC-25L, there is only limited knowledge about its use in daily practice. This manuscript aims to provide guidelines for the best way to use VYC-25L in clinical practice, focusing mainly on three issues: (1) the best patient profile; (2) patient-tailored treatment approaches to improve esthetic outcomes; and

(3) the prevention of adverse events and potential complications. Thus, in this article we shall establish consensus-based recommendations to provide doctors with a reference framework extracted from the available data and the panel's clinical experience.

2 | METHODS

A multidisciplinary group of experts in esthetic medicine from Spain and Portugal convened to discuss the use of VYC-25L in clinical practice. Meetings took place using a virtual platform from April 3 to May 26, 2020.

Different topics emerged as core concerns, including patient profiles, injection techniques, indications, and potential complications (Table 1). As a result, the authors drafted this consensus document based on their experience and opinions, and on a literature search of PubMed conducted in using the search terms "Hyaluronic acid" OR "Dermal Fillers" OR "Aesthetics" OR "Tissue bio-integration" OR "complications." Articles on human subjects in English, French, Portuguese, or Spanish were selected. Moreover, the references cited in the selected articles were also reviewed to identify additional relevant reports. In addition, relevant national and international guidelines were also reviewed.

Consensus was achieved by discussing the expert panel's opinions, and considering their clinical experiences and the currently available scientific evidence. An initial document was drafted as a result of these meetings, and it was reviewed by the members of

TABLE 1 The session's objectives and the issues considered as key points for the Consensus document about the use of VYC-25L (Juvéderm Volux®; Allergan plc) in clinical practice

Session objectives and key points

Patient profile:

- To identify and understand the different types of patients who can benefit from VYC-25L treatment.
- To determine how specialists can readily diagnose these patients in private clinical practice.
- To identify other possible indications that can be treated with VYC-25L.

Tailored treatment approach

- To understand and select the best treatment approach to be used for each patient profile based on their characteristics and needs.
- To understand and evaluate the best way to administer the treatment.
- To understand the possibility to combine VYC-25L with other esthetic treatments in these patients.

Safety

- To develop treatment strategies, recommendations and/or advice for the correct and safe use of VYC-25L.
- To establish potential risks or "warnings signs" that should be borne in mind based on the patient's baseline characteristics (medical and/or family history).
- To understand and to determine when and how it is appropriate and/or convenient to make recommendations to the patient (psychological profile, educational level, etc.).

the expert panel. Feedback from the panel was taken into consideration until the greatest level of consensus was achieved and the final text was validated. During the structured consensus-based decision-making process, panel members voted on the draft statements and recommendations. The extent of agreement was determined at the end of the session held on May 26, 2020 (Table 2).

3 | RESULTS

3.1 | Patient profile

Choosing the appropriate patients for treatment with VYC-25L is essential to obtain optimal esthetic results. Prior to any treatment, it is crucial to perform an exhaustive examination to determine why the patient wants to undergo esthetic treatment and to establish "realistic" treatment goals.²⁰

According to the expert opinion, the first step is to identify whether the patient is a suitable candidate for a lower third intervention.

- Recommendation 1 (Strong consensus): It is essential to establish whether the facial proportions and facial angles make the patient a good candidate for treatment. Evaluating the different measurements and characteristics of the jaw is crucial to determine the best patient profile to be treated.

An individual's facial beauty is determined by the harmony of its proportions and symmetry.²¹ Symmetry and balance are two relevant aspects that should be taken into consideration during the patient's facial assessment and diagnosis.²² Among the different facial angles, the glabella-subnasale-pogonion angle may be considered as the most important one. The mean value of the glabella-subnasale-pogonion angle ranges from 165° to 175°.²³

In addition, the "WAY" paradigm may be a valuable tool to diagnose and treat aging in the mid- and lower third of the face.²⁴ This paradigm takes into consideration different aspects of facial aging, including the appearance of the jaw contour ("W"); the prejowl ("A");

TABLE 2 Classification of the agreement in the consensus decision-making process

Level of consensus	Extent of agreement as a percentage
Strong consensus	>95% of the participants agree
Consensus	>75%-≤95% of the participants agree
Majority agreement	>50%-≤75% of the participants agree
No consensus	≤50% of the participants agree

Adapted from the German Association of the Scientific Medical Societies (AWMF)—Standing Guidelines Commission.³³

and the tear trough, palpebromalar area, and nasojugal groove ("Y") regions.

Table 3 summarizes the most important measurements to take into account.

- Recommendation 2 (Strong consensus): The most suitable patients for an intervention with VYC-25L in the lower third are patients with microgenia (women and men), and those undergoing masculinization (men) or rejuvenation of the lower third, mainly the jawline (women and men).

In addition to those profiles mentioned above, other patients that may obtain significant benefit from such a procedure are as follows:

1. Patients with facial laxity (Majority agreement);
2. Patients with thick subcutaneous cellular tissue in the upper and middle third of the face (myomodulation of the levator muscles due to their tightening effect).
3. Patients with a "heavy face" who have sagging tissues (skin/subcutaneous cellular tissue) in the upper and middle third of the face.
4. Patients with a double chin (Majority agreement).
5. Recommendation 3 (Strong consensus): Due to the product's characteristics¹, VYC-25L is especially well suited for creating and restoring facial volume in areas where strong muscles are present, such as the chin and jaw, and to add bone support.

3.2 | Treatment

The introduction of new products onto the market often requires new treatment paradigms to be devised. These new paradigms aim to establish comprehensive approaches focused more on achieving patient beautification than on treating individual facial deficiencies. Due to the increasing popularity of minimally invasive esthetic procedures, it is necessary to create a "common language" that can be used not only to describe treatment approaches but also to communicate among specialists around the world. The medical codes developed by de Maio (MD Codes®: 31) are specific injection guidelines that enable optimal esthetic outcomes to be achieved. The MD Codes® represent precise anatomical sites and procedures for the injection of HA fillers, referring to the Cheek (Ck); Temple (T); Chin (C); Jowls (Jw); Forehead (F); Lateral orbital (O); Eyebrow (E); Tear trough (Tt); Glabella (G); Nasolabial fold (NL); Marionette line (M); Lip (Lp); and Nose (N).²⁶

- Recommendation 4 (Strong consensus): High-quality, standardized photographs should be used. The panel recommends taking photographs at angles of 0°, 45°, and 90° (right and left). If possible, it would be preferable to obtain three-dimensional (3D) images.
- Recommendation 5 (Strong consensus): The recommendation is to use a customized 7-point protocol with women, which includes

TABLE 3 Different measurements and characteristics of the jaw to be taken into account

Examination	Description
Dental occlusion	Pay special attention to class II malocclusion as this may be due to any combination of the jaw, tooth, and lip position. In these patients, the upper jaw (maxilla) can be too far forward or more usually, the lower jaw (mandible) is too far back. ³⁴
Evaluation of facial angles	Glabella-subnasale-pogonion angle: Describe the angle of facial convexity, which is formed by connecting the soft tissue glabella, subnasale and soft tissue pogonion. ^{35,36} This value ranges from 165° to 175°. ^{34,35}
Evaluation of the effective jaw length	Evaluate the distance between the condilion and gnation, or between the condilion and pogonion (both are acceptable). The mean (\pm standard deviation) of the effective jaw length from the condilion to gnation is 120.2 (\pm 5.3) mm in women and 132.3 (\pm 6.8) mm in men. ³⁷
Evaluation of the chin	Analyze the previously described facial angles.
Evaluation of muscle activity	It is very important to assess the depressor anguli oris, mentalis and masseter muscle activity, in addition to that of the superficial musculoaponeurotic system.
Evaluation of skin laxity and submental fat	Evaluating these aspects may be important when addressing combined treatments (neck + submental fat). It is important to maintain good skin integrity and structure. The "WAY" paradigm* may be a useful method to diagnose skin laxity and facial aging. ²⁴

*WAY refers to the appearance of: the jaw contour ("W"); the prejowl ("A"); and the tear trough, palpebromalar area and nasojugal groove ("Y").



FIGURE 1 Customized 7-point preferred protocol pattern recommended for women (adapted from de Maio:²⁶): Ck1, Zygomatic arch; Ck4, Lateral lower cheek/parotid area; Jw1, Mandible angle; Jw4, Lower prejowl; Jw5, Lower anterior Chin; C1, Labiomental angle; C2, Chin apex. This photograph has been reprinted with permission from Allergan plc, Dublin, Ireland

the following treatment areas: zygomatic arch; lateral lower cheek/parotid area; labiomental angle; chin apex; mandible angle; lower prejowl; and lower anterior chin (see Figure 1).

- Recommendation 6 (Strong consensus): The recommendation is to use a customized 9-point protocol with men, which includes the following treatment areas: zygomatic arch; lateral lower cheek/parotid area; labiomental angle; chin apex; lateral lower chin; mandible angle; pre-auricular area; lower prejowl; and lower anterior chin (see Figure 2).
- Recommendation 7: Despite its main indication for lower third facial treatments, due to its characteristics VYC-25L may also be effectively used for facial contouring at other locations:

- Temple – based on the MD Codes®.²⁶
 - Anterior temple: Strong consensus.
 - Posterior temple: No consensus.
- Cheek – based on the MD Codes®.²⁶
 - Zygomatic arch: Strong consensus.
 - Zygomatic eminence: No consensus.
 - AnteVromedial cheek: Majority agreement.

The panel addressed the esthetic management of 7 different situations, namely, beautification (women); masculinization (men); microgenia (women and men); rejuvenation (women and men); and submental convexity (women and men).

1 Women

Different treatment approaches were assessed in women, including beautification; microgenia; rejuvenation; and submental fat convexity (Table 4).

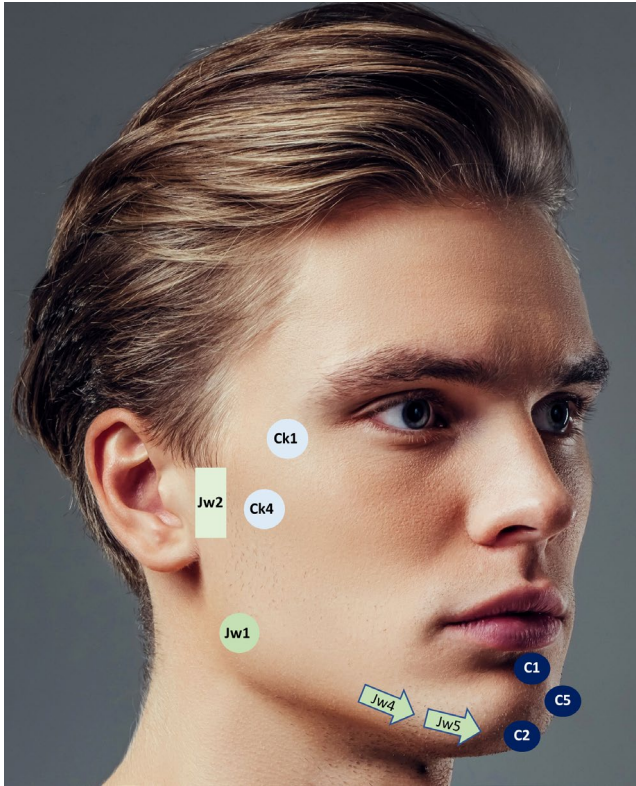


FIGURE 2 Customized 9-point preferred protocol pattern recommended for men (adapted from de Maio:²⁶). Ck1, Zygomatic arch; Ck4, Lateral lower cheek/parotid area; Jw1, Mandible angle; Jw2, Pre-auricular area; Jw4, Lower prejowl; Jw5, Lower anterior chin; C1, Labiomental angle; C2, Chin apex; C5, Lateral lower chin. This photograph has been reprinted with permission from Allergan plc, Dublin, Ireland

2. Men

The treatment indications for men included masculinization; microgenia; rejuvenation; and submental fat convexity (Table 5).

3. Other considerations

Besides the specific treatment strategies recommended for men and women, other issues that should be taken into consideration include dose/plane; learning curve; and warnings (Table 6). These were discussed along with additional aspects of the treatments, and the consensus reached regarding the MD Codes®, the areas to be injected, the dose, the depth, and the administration technique are summarized in Table 7. In terms of the amount of filler to be used, the volume administered should be customized depending on the patient's sex, age, and facial structure. It is advisable to start with volumes of 0.3–0.5 cc for each MD Code® treated and the panel recommended that a volume of 0.5 ml per/MD Code® should not be exceeded. In addition, it was considered that treatment can be performed in either one or two sessions, depending on the patient's specific characteristics.

3.3 | Safety

According to panel's experience, no unexpected adverse events have been observed with VYC-25L.

- Recommendation 8 (strong consensus): To prevent serious adverse events and undesirable outcomes, in addition to the filler's characteristics, it is extremely important to have an exhaustive knowledge of facial anatomy and of the aging process. Moreover, a complete medical history should be obtained from the patient and the procedure and technique should be carefully documented (dose, plane, administration, and treatment patterns).

4 | DISCUSSION

The new products developed for esthetic medicine are designed to address new indications or to improve the results of existing ones, often associated with new procedures and altered treatment paradigms. These advances represent a constant challenge for specialists who must keep up with the new alternatives and the novel approaches available. Moreover, as new products emerge on the market, the clinical experience in using them is initially limited, which makes it necessary to draw up new clinical guidelines that can help specialists who are new to these procedures and those who have less experience with the products to incorporate them into their clinical arsenal.

To date, there are few studies that have evaluated the efficacy and safety of VYC-25L in patients who undergo minimally invasive esthetic procedures.^{15–17,27} A prospective, single-blind, randomized, multicenter, international, controlled study evaluated the efficacy and safety of VYC-25L when used to restore and create facial volume in the chin and jaw areas of subjects with chin retrusion.^{15,16} The data showed that VYC-25L achieved optimal esthetic outcomes with a good safety profile, making it an alternative to surgical interventions to increase chin projection and jaw volume. Moreover, the use of VYC-25L was associated with good patient and specialist satisfaction.^{15,16}

A retrospective, single-center study was also carried out on adult patients who underwent treatment of the lower third of the face with VYC-25L.²⁷ Again, this study showed a good safety profile and high patient satisfaction in terms of chin and jawline sculpting.²⁷ In another retrospective, single-center study, this time on patients who underwent a minimally invasive rhinoplasty, VYC-25L, demonstrated good efficacy and a good safety profile, in association with good patient satisfaction.¹⁷ In addition to clinical outcomes, tissue integration is an important aspect of HA fillers. Heterogeneous patterns are evident upon ultrasound examination, with no residual anechoic/hypoechoic areas, indicative of the full integration of VYC-25L into the tissue 30 days after injection.¹⁹

Irrespective of the technique used, facial analysis is the cornerstone to achieve optimal outcomes, which critically depends on understanding the underlying anatomy and the clinical implications of facial aging.²⁸ Moreover, when considering facial muscles, it is

Indication	Recommendation
Beautification	<ul style="list-style-type: none"> The therapeutic strategy of choice is the 7-point pattern (See Figure 1: Strong consensus). The MD Codes® T1, Ck1 and Jw1 may be considered as the pillar for beautification (Strong consensus). The treatment of MD Codes® Ck2 and Ck3 is recommended, although this may depend on the patient's needs (Strong consensus). The treatment of the MD Codes® Jw4 and Jw5 is crucial in beautification and facial contouring, improving prejowl appearance, inducing myomodulation, and acting on the superficial musculoaponeurotic system (SMAS) and the retaining ligaments (Strong consensus). The MD Codes® C1 and C2 are essential to treat the chin and to provide support to the lip (Strong consensus). Treating the MD Code® Ck4 is advisable for "top model look" contouring (Consensus). The treatment of MD Code® C1 mostly depends on the patient's needs (Consensus). In those cases, with no loss of structural support and in the absence of aging, in addition to the 7-point pattern, it would be advisable to treat the lip (according to the patient's needs) and Ck2 (No consensus).
Microgenia ^a	<ul style="list-style-type: none"> The treatment of microgenia requires an approach tailored to each patient (Strong consensus). The MD Codes® of choice for treating microgenia are C1, C2, C4, Jw1, Jw4, and Jw5 (Strong consensus). The MD Codes® where VYC-25L treatment produces the greatest benefit are C2 and C4 (strong consensus). The MD Code® C5 must be avoided (strong consensus). In some selected patients, especially those with laxity and loss of volume in the mid-face, treating the Ck MD Codes® may be a valuable strategy (Majority agreement). Treatment of the MD Code® C1 might be associated with eversion of the inferior lip in some patients with sagittal microgenia (No consensus).
Rejuvenation	<ul style="list-style-type: none"> Rejuvenation requires full-face assessment and a comprehensive approach to select the MD Codes® that best fit the patient's needs (Strong consensus). For rejuvenation, the 7-point pattern is the strategy of choice, although in some patients it would be worth adopting a customized approach according to patient's needs (consensus). Treating MD Codes® Ck2 and Ck3 may be an option in some cases (Majority agreement). Treating MD Code® T1 may be a valuable option when attempting to achieve beautification and rejuvenation (No consensus).
Submental fat	<ul style="list-style-type: none"> The MD Codes® of choice to treat submental convexity are Jw1, Jw3, Jw4, Jw5, C2, and C4 (Strong consensus). Although HA fillers were not originally designed to treat submental convexity, this may be significantly improved by treating the mid- and lower-face MD Codes® with these (myomodulation, action on the SMAS and on retaining ligaments: Consensus).

Abbreviations: C1, Labiomental angle; C2, Chin apex; C4, Anterior chin/soft tissue pogonion; C5, Lateral lower chin; Ck1, Zygomatic arch; Ck2, Zygomatic eminence; Ck3, Anteromedial cheek; Ck4, Lateral lower cheek/parotid area; Jw1, Mandible angle; Jw3, Mandible body; Jw4, Lower prejowl; Jw5, Lower anterior chin; T1, Anterior temple; HA, Hyaluronic acid; SMAS, Superficial musculoaponeurotic system.

^aMicrogenia is usually associated with maxillary and mandibular atrophy in both men and women.

TABLE 4 Overview of the main panel recommendations and considerations about the treatment strategies for women. Each point identified in this table corresponds to those defined in the MD codes®²⁶

important not only to focus on the treatment results at rest but also in movement. The effectiveness of the HA fillers in modulating muscle activity has been described previously.²⁹ It was proposed that the HA fillers can mechanically alter muscle contraction by either facilitating or blocking their action.²⁹

Although HA filler injection is considered a safe procedure, the rising popularity of dermal fillers has led to an increase in the number of complications associated with their use.^{30,31} Several early and late onset complications have been associated with the use of HA fillers, including local injection site reactions, infection, hypersensitivity,

TABLE 5 Overview of the panel's main recommendations and considerations regarding the treatment strategies for men. Each point identified in this table correspond to those defined in the MD codes®²⁶

Indication	Recommendation
Masculinization	<ul style="list-style-type: none"> The preferred therapeutic strategy of choice for men is the 9-point pattern, including the MD Codes® T1, Ck1, Ck4, Jw1, Jw2, Jw4, Jw5, C1, C2, and C5 (See Figure 2: Strong consensus). The most important points are the MD Codes® Ck1, Jw1, and Jw2 (Strong consensus). The MD Code® Ck4 deserves special attention because it makes the profile more slender and it gives the man a softer look. Depending on the patient's characteristics this point could also be avoided (Strong Consensus). In addition, MD Codes® C2 and C5 are very important for masculinization to achieve a firmer and squarer chin (Strong consensus). VYC-25L is well suited to treat the Prejowl as it induces a myomodulation (Consensus). In some cases, treating MD Codes® (E1 and E2)* of the eyebrow may be recommended to create structure in the superciliary arch (No consensus).
Microgenia ^a	<ul style="list-style-type: none"> Treatment of microgenia requires an approach tailored to each patient (Strong consensus). The most important MD Codes® to treat microgenia are C1, C2, C4, C5, Jw1, Jw3, Jw4, and Jw5 (Strong consensus). In those patients with no aging, treating MD Codes® Ck1 and Ck4 may be omitted (Consensus). Treatment of MD Code® C3 may be useful to improve the pogonion projection and provide bone and subcutaneous structure (No consensus).
Rejuvenation	<ul style="list-style-type: none"> The basic therapeutic strategy would be based on a 9-point pattern (See Figure 2). Nevertheless, a comprehensive approach that addresses the specific needs of each patient is the best treatment (Strong consensus). Treatment of MD Code® Ck4 may be considered depending on the aging and skin thickness (thicker skin: Consensus). Treatment of MD Code® Ck2 may cause feminization and as such, it should be approached very cautiously (No consensus).
Submental fat	<ul style="list-style-type: none"> Treating MD Codes® Jw1, Jw2, Jw4, Jw5, C2 C4, and C5 were indicated (strong consensus). Although HA fillers were not originally contemplated to treat submental convexity, this may be significantly improved by using them to treat the mid- and lower-face MD Codes®, thereby achieving myomodulation, acting on the SMAS and on the retaining ligaments (Consensus).

Abbreviations: C1, Labiomental angle; C2, Chin apex; C3, Anterior chin; C4, Anterior chin/soft tissue pogonion; C5, Lateral lower chin; Ck1, Zygomatic arch; Ck2, Zygomatic eminence; Ck4, Lateral lower cheek/parotid area; Jw1, Mandible angle; Jw3, Mandible body; Jw4, Lower prejowl; Jw5, Lower anterior chin; T1, Anterior temple; HA, Hyaluronic acid; SMAS, Superficial musculoaponeurotic system.

^aMicrogenia is usually associated to maxillary and mandibular atrophy in both women and men.

*There was no consensus on this issue. The panel's opinions ranged from those who do not treat these points to those who treat them with other HA fillers like VYC-17.5L, as well as those who treat them with VYC-25L.

technical and placement errors, skin discoloration, and vascular conditions.³⁰⁻³²

Finally, as a limitation of the current consensus, it should be noted that VYC-25L is a relatively new product, and thus, clinical experience with it is limited to the short- to mid-term. Nevertheless, there is evidence suggesting it has a good safety and efficacy profile¹⁵⁻¹⁷ and that VYC-25L has a very good bio-integration profile as reflected by its partial tissue bio-integration 48 h after treatment and total integration 30 days after filler injection.¹⁹ However, all consensus documents, and perhaps this one in particular, must be considered within an evolving environment, and therefore, this document should be regularly revised to implement novel findings as they occur and future evidence as it becomes available.

5 | CONCLUSIONS

To achieve optimal esthetic outcomes, clinicians must have an exhaustive knowledge of facial anatomy, filler characteristics, injection techniques, and, in particular, the patients best suited for an intervention. According to the panel's recommendations, VYC-25L represents a valuable option to treat patients with microgenia (women and men), and for masculinization (men) and rejuvenation of the lower third of the face (women and men). Guidelines are laid out for how these patients should be treated and how they should be managed. Regarding safety, the incidence of complications is low, the majority of adverse events are mild, and no unexpected adverse events have been observed with VYC-25L. This consensus highlights

Indication	Recommendation/Considerations
Dose/Plane	<ul style="list-style-type: none"> The volume administered must be customized depending on sex, age and facial structure (bone, SMAS, muscles, subcutaneous cellular tissue and skin: Strong consensus). It is advisable to start with volumes of 0.3 to 0.5 cc per treated MD Code® (Strong consensus). Only use up to 0.5 cc of VYC-25L for the MD Codes® used to treat microgenia, as problems may appear if that dose is exceeded (Strong consensus). The lower third of the face is mainly treated with a supraperiostic approach with either a needle or cannula, (MD Codes® C2, C4 and C5), and combined with a subcutaneous approach if there are wrinkles (C6, Jw4 and Jw5: Strong consensus). To treat MD Codes® C and Jw, the total volume administered should not exceed 4 ml/per session (Strong consensus). Treatment can be performed in either one or two sessions, depending on the patient's characteristics (Strong consensus). <ul style="list-style-type: none"> Microgenia: One or two sessions depending on the volume needed. Rejuvenation: Patient-tailored approach. To treat the chin, a volume greater than 2–3 ml of VYC-25L is not recommended (Strong consensus). To assess treatment outcomes, a follow-up visit should be scheduled 1 month after treatment (Strong consensus). If it were necessary to administer an additional dose after 1 month, the panel recommends (Strong consensus): <ul style="list-style-type: none"> Treating if the volume to be administered is ≤1 ml Waiting until month 6 if the volume to be administered is >1 ml
Learning curve	<ul style="list-style-type: none"> As happen with all similar treatments, administering VYC-25L requires a learning curve (Strong consensus). With regard to this learning curve, the panel recommends prioritizing volume/MD Code® over plane/area (Strong consensus).
Warnings	<ul style="list-style-type: none"> Special care should be taken with those patients with thin skin and little adipose panniculus (Consensus). Patients may experience some degree of discomfort during the first 24–48 h after treatment, which can be successfully managed without additional treatments or sequelae. Patients should not undergo dental procedures that might lead to gum bleeding in the 3–4 weeks following treatment (Strong consensus).

Abbreviations: C, Chin; C2, Chin apex; C4, Anterior chin/soft tissue pogonion; C5, Lateral lower chin; C6, Lateral chin; Jw1, Mandible angle; Jw, Jaw; Jw4, Lower prejowl; Jw5, Lower anterior chin; SMAS, Superficial musculoaponeurotic system.

^aMicrogenia is usually associated to maxillary and mandibular atrophy in both women and men.

TABLE 6 Overview of the panel recommendations about safety. Each point identified in this table corresponds to those defined in the MD codes®²⁶

TABLE 7 Overview of the MD Codes, injection areas, depth, injection device, and dose of VYC-25 L to be used (adapted from de Maio²⁶)

MD Codes™	Injection area	Target layer	Tool	Delivery	Volume per site (ml) ^a
Ck1	Zygomatic arch	Supraperiostial ^b	Needle	Bolus	0.1+0.1+0.1
Ck4	Lateral lower cheek/parotid area	Subcutaneous	Cannula	Fanning	0.5
Jw1	Mandible angle	Supraperiosteal ^b	Needle ^c	Bolus	0.5
	Mandible angle	Subcutaneous	Cannula	Bolus	0.5
Jw2*	Pre-auricular area	Subcutaneous	Cannula	Bolus	0.5
Jw4	Lower prejowl	Subcutaneous	Cannula	Bolus	0.5
Jw5	Lower anterior chin	Subcutaneous	Cannula	Bolus	0.5
C1	Labiomental angle	Subcutaneous	Cannula	Bolus	0.5
C2	Chin apex	Subcutaneous	Cannula	Bolus	0.3 to 0.5
	Chin apex	Supraperiosteal ^b	Needle ^c	Bolus	0.3 to 0.5
C5*	Lateral lower chin	Supraperiosteal ^b	Needle ^c	Bolus	0.3 to 0.5

^aRecommended volumes were determined based on the panel's clinical experience.

^bDo not inject into the cartilage or bone but rather at the level of the cartilage or bone.

^cAspiration is highly recommended when injecting with a needle at the level of the bone.

*Only in men.

relevant points that may help professionals to undertake esthetic procedures with VYC-25L safely and effectively. Moreover, it could serve as a basis to standardize procedures, which may help achieve optimal and predictable esthetic results.

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CONFLICT OF INTERESTS

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ETHICAL APPROVAL

Authors declare human ethics approval was not needed for this study.

AUTHOR CONTRIBUTIONS

M.A.S. and F.U.G. designed and directed the project, the main conceptual ideas, and proof outline. P.A.B, S.C., and I.D. drafted the manuscript, literature search, and designed the tables and figures. N.E., L.F.P., and V.F. performed literature search, funding acquisition, and project administration; F.O., M.C.S., and L.U. involved in critical review and edition of the manuscript. All authors reviewed the results and approved the final version of the manuscript.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

ORCID

María A. Segurado  <https://orcid.org/0000-0002-4849-1086>

Fernando Urdiales-Gálvez  <https://orcid.org/0000-0001-6913-5278>

ENDNOTE

¹ VYC-25L combines the highest elastic Modulus (G') HA, which reflects the elasticity of the material when deformed, and it has the highest cohesivity currently available on the market³⁰.

REFERENCES

- <https://www.isaps.org/wp-content/uploads/2020/12/Global-Survey-2019.pdf> - Accessed May 12, 2021.
- Brandt FS, Cazzaniga A. Hyaluronic acid gel fillers in the management of facial aging. *Clin Interv Aging*. 2008;3(1):153-159.
- Carruthers J, Cohen SR, Joseph JH, Narins RS, Rubin M. The science and art of dermal fillers for soft-tissue augmentation. *J Drugs Dermatol*. 2009;8(4):335-350.
- Funt D, Pavicic T. Dermal fillers in aesthetics: an overview of adverse events and treatment approaches. *Clin Cosmet Investig Dermatol*. 2013;12(6):295-316.
- Tezel A, Fredrickson GH. The science of hyaluronic acid dermal fillers. *J Cosmet Laser Ther*. 2008;10(1):35-42. Erratum in: *J Cosmet Laser Ther*. 2014; 16(1):45.
- Gutowski KA. Hyaluronic acid fillers: science and clinical uses. *Clin Plast Surg*. 2016;43(3):489-496.
- Laurent TC, Fraser JRE. Hyaluronan. *FASEB J*. 1992;6:2397-2404.
- Stocks D, Sundaram H, Michaels J, Durrani MJ, Wortzman MS, Nelson DB. Rheological evaluation of the physical properties of hyaluronic acid dermal fillers. *J Drugs Dermatol*. 2011;10(9):974-980.
- Segura S, Anthonioz L, Fuchez F, Herbage B. A complete range of hyaluronic acid filler with distinctive physical properties specifically designed for optimal tissue adaptations. *J Drugs Dermatol*. 2012;11(1 Suppl):s5-8.
- Mansouri Y, Goldenberg G. Update on hyaluronic acid fillers for facial rejuvenation. *Cutis*. 2015;96(2):85-88.
- Greene JJ, Sidle DM. The hyaluronic acid fillers: current understanding of the tissue device interface. *Facial Plast Surg Clin North Am*. 2015;23(4):423-432.
- Micheels P, Sarazin D, Tran C, Salomon D. Effect of different cross-linking technologies on hyaluronic acid behavior: a visual and microscopic study of seven hyaluronic acid gels. *J Drugs Dermatol*. 2016;15(5):600-606.
- Philipp-Dormston WG, Hilton S, Nathan M. A prospective, open-label, multicenter, observational, postmarket study of the use of a 15 mg/mL hyaluronic acid dermal filler in the lips. *J Cosmet Dermatol*. 2014;13(2):125-134.
- Pierre S, Liew S, Bernardin A. Basics of dermal filler rheology. *Dermatol Surg*. 2015;41(Suppl 1):S120-S126.
- Ogilvie P, Sattler G, Gaymans F, et al. Safe, effective chin and jaw restoration with VYC-25L hyaluronic acid injectable gel. *Dermatol Surg*. 2019;45(10):1294-1303.
- Ogilvie P, Benouaiche L, Philipp-Dormston WG, et al. VYC-25L Hyaluronic acid injectable gel is safe and effective for long-term restoration and creation of volume of the lower face. *Aesthet Surg J*. 2020;40(9):NP499-NP510.
- Bertossi D, Malchiodi L, Albanese M, Nocini R, Nocini P. Nonsurgical rhinoplasty with the novel hyaluronic acid filler VYC-25L: results using a nasal grid approach. *Aesthet Surg J*. 2021;41(6):NP512-NP520. <https://doi.org/10.1093/asj/sjaa196>
- Tran C, Carraux P, Micheels P, Kaya G, Salomon D. In vivo biointegration of three hyaluronic acid fillers in human skin: a histological study. *Dermatology*. 2014;228(1):47-54.
- Urdiales-Gálvez F, Barres-Caballer J, Carrasco-Sánchez S. Ultrasound assessment of tissue integration of the crosslinked hyaluronic acid filler VYC-25L in facial lower-third aesthetic treatment: a prospective multicenter study. *J Cosmet Dermatol*. 2021;20(5):1439-1449. <https://doi.org/10.1111/jocd.13632>
- 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.
- Milutinovic J, Zelic NN. Evaluation of facial beauty using anthropometric proportions. *ScientificWorldJournal*. 2014;2014:428250.
- Farolch-Prats L, Nome-Chamorro C. Facial contouring by using dermal fillers and botulinum toxin a: a practical approach. *Aesthetic Plast Surg*. 2019;43(3):793-802.
- Park C, Lee M, Jung Y. Photogrammetric facial analysis of attractive celebrities using the glabella for planning rhinoplasty and analyzing surgical outcomes. *Arch Aesthetic Plast Surg*. 2018;24:105-110. Available in: <https://e-aaps.org/journal/view.php?doi=https://doi.org/10.14730/aaps.2018.24.3.105> Accessed May 12, 2021.

24. Farollch Prats L, Mirada Donisa E, Villanueva C. "WAY": A practical means to identify and treat the aging process. *J Cosmet Dermatol*. 2021;20(6):1837-1845. <https://doi.org/10.1111/jocd.13782>
25. Pierre S, Liew S, Bernardin A. Basics of dermal filler rheology. *Dermatol Surg*. 2015;41(Suppl 1):S120-S126.
26. de Maio M. MD Codes™: A methodological approach to facial aesthetic treatment with injectable hyaluronic acid fillers. *Aesthetic Plast Surg*. 2021;45(2):690-709. <https://doi.org/10.1007/s00266-020-01762-7>
27. Bertossi D, Robiony M, Lazzarotto A, Giampaoli G, Nocini R, Nocini PF. Nonsurgical redefinition of the chin and jawline of younger adults with a hyaluronic acid filler: results evaluated with a grid system approach. *Aesthet Surg J*. 2021;41(9):1068-1076. <https://doi.org/10.1093/asj/sjaa179>
28. Little JW. Volumetric perceptions in midfacial aging with altered priorities for rejuvenation. *Plast Reconstr Surg*. 2000;105(1):252-266.
29. de Maio M. Myomodulation with injectable fillers: an innovative approach to addressing facial muscle movement. *Aesthetic Plast Surg*. 2018;42(3):798-814.
30. Urdiales-Gálvez F, Delgado NE, Figueiredo V, et al. Treatment of soft tissue filler complications: expert consensus recommendations. *Aesthetic Plast Surg*. 2018;42(2):498-510.
31. Ortiz AE, Ahluwalia J, Song SS, Avram MM. Analysis of U.S. Food and Drug Administration data on soft-tissue filler complications. *Dermatol Surg*. 2020;46(7):958-961.
32. Park TH, Seo SW, Kim JK, Chang CH. Clinical experience with hyaluronic acid-filler complications. *J Plast Reconstr Aesthet Surg*. 2011;64(7):892-896.
33. German Association of the Scientific Medical Societies (AWMF). Standing Guidelines Commission. AWMF guidance manual and rules for guideline development. English version. Available in: <http://www.awmf.org/leitlinien/awmf-regelwerk.html> - Accessed January 20, 2021.
34. Batista KB, Thiruvengkatachari B, Harrison JE, O'Brien KD. Orthodontic treatment for prominent upper front teeth (Class II malocclusion) in children and adolescents. *Cochrane Database Syst Rev*. 2018;3(3):CD003452.
35. Legan HL, Burstone CJ. Soft tissue cephalometric analysis for orthognathic surgery. *J. Oral Surg*. 1980;38(10):744-751.
36. Anić-Milosević S, Lapter-Varga M, Slaj M. Analysis of the soft tissue facial profile by means of angular measurements. *Eur J Orthod*. 2008;30(2):135-140.
37. McNamara JA Jr. A method of cephalometric evaluation. *Am J Orthod*. 1984;86(6):449-469.

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