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ORIGINAL ARTICLE

Nonsurgical rhinoplasty using the hyaluronic acid filler VYC-25L: Safety and patient satisfaction in a retrospective analysis of 492 patients

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Abstract

Background: Aesthetic treatment of the nose with hyaluronic acid (HA) fillers is increasingly popular but carries a small risk of major complications. Large patient cohorts are required to better understand this risk.

Aims: To evaluate safety and patient satisfaction in a large series of nonsurgical rhinoplasty treatments with the HA filler, VYC-25L, in "real world" clinical practice.

Methods: This was a retrospective analysis of consecutive adult patients undergoing nonsurgical rhinoplasty with VYC-25L by a single injector between January 2020 and July 2022. All patients received initial treatment (typically ~0.3–0.5 mL of filler) and touch-up at 4–6 weeks (~0.1–0.3 mL). Safety data were collected throughout a mean follow-up of 11.1 months. Patient satisfaction was assessed using the FACE-Q Satisfaction with Nose and Satisfaction with Outcome questionnaires.

Results: A total of 492 patients were included (984 treatment sessions including touch-ups). Of these, 467 (94.9%) were female and the mean age was 30.0 years. All treatments were associated with early transient edema; other adverse events included bruising ($n = 123$; 25%), residual asymmetry ($n = 18$; 3.7%), and suspected localized vascular occlusion ($n = 3$; 0.6%). The latter cases were easily resolved with hyaluronidase injection plus oral steroid and aspirin. No patients experienced infection, necrosis, blindness, lumps, granuloma, or delayed-onset nodules. Mean Rasch-transformed FACE-Q scores were 90.2% for Satisfaction with Nose and 99.2% for Satisfaction with Outcome.

Conclusions: In a large cohort of patients treated in routine practice based on a systematic approach, nonsurgical rhinoplasty with VYC-25L was safe and effective.

KEYWORDS
filler, hyaluronic acid, nonsurgical rhinoplasty, VYC-25L, Vycross

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1 | INTRODUCTION

Hyaluronic acid (HA) fillers are among the most commonly used facial aesthetic treatments worldwide.[1,2] However, the face is a complex, dynamic structure and not all fillers are suitable for all areas. Instead, the product used should be tailored to the area being treated, based on a variety of factors, not least its rheologic and physicochemical properties.

The nose has classically been regarded as a difficult area to treat with fillers, owing to the high degree of skin tension over underlying bone and cartilage, creating significant compressive forces that led to loss of projection with previous generations of HA fillers.[3,4] Hence, surgical rhinoplasty has long been considered the gold standard. However, this paradigm is beginning to change with the advent of HA fillers that have greater cohesivity and increased elastic modulus (G′)—providing enhanced lift capacity, more resistance to deformation, and reduced lateral spread, thus allowing vertical projection to be maintained over time.[5]

VYC-25L is a novel filler with a high HA concentration (25 mg/mL) and increased cohesivity and G'.[6] In a prospective, randomized, controlled trial of patients requesting chin and jaw restoration, VYC-25L treatment was associated with increased Global Aesthetic Improvement Scale scores and durable responses on the FACE-Q Satisfaction and Psychological Well-Being Scales.[6,7] In addition, several recent "real world" studies have shown that VYC-25L is safe and effective for aesthetic improvement of the nose, based on standardized approaches to treatment.[4,8,9] However, these studies included only modest numbers of patients. Given the risks associated with filler-based nasal treatment—particularly relating to rare but potentially devastating complications like necrosis and blindness[10,11]—it is important to evaluate the safety profile in large patient cohorts treated in routine practice.

The purpose of the present study was to evaluate safety and patient satisfaction in a series of almost 1000 treatment sessions in consecutive patients receiving nonsurgical rhinoplasty with VYC-25L.

2 | MATERIALS AND METHODS

2.1 | Study design and subjects

This was a retrospective analysis of consecutive patients who underwent nonsurgical rhinoplasty with VYC-25L (Juvéderm® Volux™ XC, Allergan Aesthetics, an AbbVie Company), treated by a single injector at one center between January 2020 and July 2022. All patients were aged ≥18 years and were considered suitable for nonsurgical rhinoplasty based on indications such as dorsal hump, drooping tip, or minor asymmetry. Eligible patients included those with or without previous surgical rhinoplasty, but individuals with multiple revisions and/or particularly high risk were not treated. Patients with poor skin quality, for example due to sun damage, were also excluded.

The study was conducted in accordance with the Declaration of Helsinki, and all patients provided written informed consent for treatment.

2.2 | Techniques

Prior to treatment, patients were asked to remove makeup and wash their face thoroughly, and the nose and surrounding area were cleansed with chlorhexidine. Five key areas were injected as needed—the radix, rhinion, columella, supratip, and tip—with the use of individual points customized according to the specific indication. The order in which they were injected was also determined on a case-by-case basis. In many instances, treatment began at the tip of the nose; however, in cases of moderate–severe nasal hump for example, the radix was injected first to reduce the severity of the hump, and then other areas were treated before returning to the radix to finalize the result. Injections were made deep to the perichondrial/periosteal plane using a 30G needle (radix, rhinion, and supratip) or 25G cannula (columella and tip). Aspiration was employed in all treatments.

Following the injections, the entire area was disinfected with chlorhexidine and patients were briefed on aftercare. This included guidance on how to watch out for complications, as well as instructions to sleep on their back; avoid icing the nose; increase fluid intake (for hydration); refrain from alcohol and foodstuffs associated with histamine release (e.g., shellfish); wear no makeup, wash hands before touching the face, and avoid exercise for 24–48 h; and refrain from wearing glasses for 2–4 weeks. Patients received follow-up telephone calls at around 24 and 48 h post-treatment, and were instructed to come back (or at least to send photographs) if there were any potential safety concerns. All patients returned at 4–6 weeks for touch-up procedures.

Injections were performed using VYC-25L, typically based on total volumes of 0.3–0.5 mL for initial treatment—with an allowance for up to 0.7 mL in males or in more severe cases. Touch-ups typically used 0.1–0.3 mL of VYC-25L.

2.3 | Assessments

Patient demographic data were collected at baseline, and early and delayed adverse events (AEs) were recorded throughout follow-up.

Patient satisfaction was assessed at 4–6 weeks after initial treatment (during the touch-up session) using the validated FACE-Q Satisfaction with Nose and FACE-Q Satisfaction with Outcome questionnaires.[12,13] The former includes 10 statements on patients' satisfaction with the appearance of their nose over the past week, and the latter incorporates six statements on their satisfaction with the most recent procedure on their nose. For both questionnaires, respondents rated their agreement with each separate statement on a 4-point scale: 1, definitely disagree; 2, somewhat disagree; 3, somewhat agree; and 4, definitely agree. Sum scores were calculated

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as totals out of 40 or 24, respectively, and were then converted into "Rasch-transformed" scores on a scale of 0–100 as per the developers' instructions. Questionnaires were provided under license from Memorial Sloan Kettering Cancer Center.

2.4 | Statistical analyses

Descriptive statistics are provided throughout, including means for continuous variables, and frequency and percentage for categorical variables.

3 | RESULTS

3.1 | Baseline characteristics

A total of 492 consecutive patients were included in this analysis. All received both initial treatment and touch-up injections 4–6 weeks later, and hence 984 treatment sessions were provided overall.

Among the subjects evaluated, 467 (94.9%) were female and the mean age was 30.0 years (Table 1). The cohort was highly ethnically diverse: fewer than half were Caucasian ($n = 195$; 39.6%), with the remainder being of East Asian, Indian, or Middle Eastern heritage. The mean duration of follow-up was 11.1 months.

Pre- and post-treatment photographs demonstrating the impact of treatment in selected study subjects are provided in Figures 1–7.

TABLE 1 Baseline characteristics.

Characteristic	Patients ($N = 492$)
Sex, *n* (%)	
Female	467 (94.9)
Male	25 (5.1)
Age group, *n* (%)	
< 20 years	5 (1.0)
20–29 years	256 (52.0)
30–39 years	172 (35.0)
40–49 years	53 (10.8)
50–59 years	3 (0.6)
60–69 years	3 (0.6)
Ethnicity, *n* (%)	
Caucasian[a]	195 (39.6)
East Asian	92 (18.7)
Indian	105 (21.3)
Middle Eastern	85 (17.3)
Other	15 (3.0)

[a]Including Hispanic patients.

3.2 | Complications

All treatments were associated with early transient edema, typically lasting around 7–10 days. Other AEs included bruising ($n = 123$; 25.0%), residual asymmetry ($n = 18$; 3.7%), and suspected localized vascular occlusion ($n = 3$; 0.6%) (Table 2). All three cases of vascular occlusion were in patients receiving injection of the nasal tip, and were successfully resolved with appropriate treatment (hyaluronidase injection, a single dose of prednisone 40–50 mg, and aspirin) (Figure 8). There were no cases of infection, necrosis or blindness, and no patients experienced lumps, granuloma, or delayed-onset nodules.

3.3 | Treatment satisfaction

High rates of patient satisfaction with treatment were recorded using the FACE-Q Satisfaction with Nose and FACE-Q Satisfaction with Outcome questionnaires. Mean Rasch-transformed scores were 90.2% and 99.2%, respectively (Table 3). These values equate to untransformed scores of 39/40 for Satisfaction with Nose and just under 24/24 for Satisfaction with Outcome.

4 | DISCUSSION

This analysis of 984 treatment sessions delivered to 492 consecutive patients confirmed the safety and overall satisfaction resulting from nonsurgical rhinoplasty with VYC-25L in routine clinical practice. Importantly, there were no cases of the most concerning complications that have been infrequently associated with HA filler treatment of the nose—such as necrosis and blindness.[10,11] To the best of my knowledge, this is the first reported large-scale case series of nonsurgical rhinoplasties based on VYC-25L. The lack of serious complications aligns with previous large, single-injector cohorts treated using other HA fillers, such as those reported by Harb (two cases of infection and three cases of localized skin necrosis in a cohort of 5000 patients)[14] and by Rivkin (five cases of ischemia/necrosis among 2275 patients).[15]

A recent systematic review and meta-analysis of 37 publications assessing the safety of nonsurgical rhinoplasty found low rates of major complications, such as vessel occlusion (0.35%), vision loss (0.09%), skin necrosis (0.08%), and infection (0.07%).[16] Similarly, another systematic review documented just eight major complications among 3928 patients from 23 studies of nonsurgical rhinoplasty with HA fillers.[17]

Nonetheless, although rare in the hands of skilled injectors, such events are potentially life-changing for patients. As responsible clinicians, we are obliged to mitigate risk as far as possible. A detailed knowledge of nasal anatomy—including blood supply and innervation—is therefore an essential prerequisite before attempting to inject this area with fillers. Prior to treatment, practitioners should always perform a thorough diagnostic examination, and

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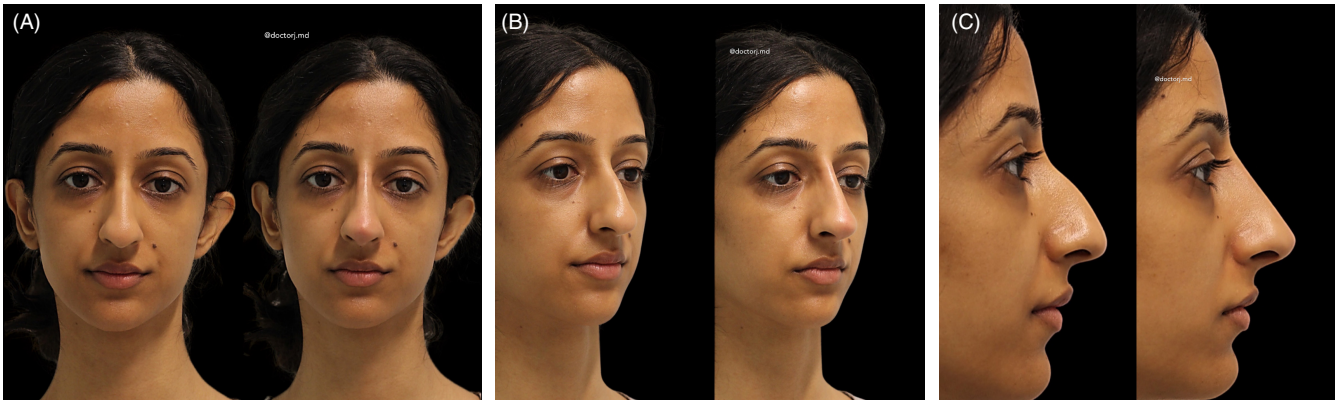


FIGURE 1 Nonsurgical rhinoplasty in an Indian female. This was a 26-year-old Indian female who presented requiring a change in nasal projection, adjustment to the columella, and tip elevation. She was initially treated using 0.7 mL of VYC-25L, with a touch-up based on 0.2 mL. Parts A–C show her before treatment (left) and 6 weeks after treatment (right). She was satisfied with the result: FACE-Q Satisfaction with Nose, 38/40 (Rasch-transformed 83/100); Satisfaction with Outcome, 24/24 (Rasch-transformed 100/100).

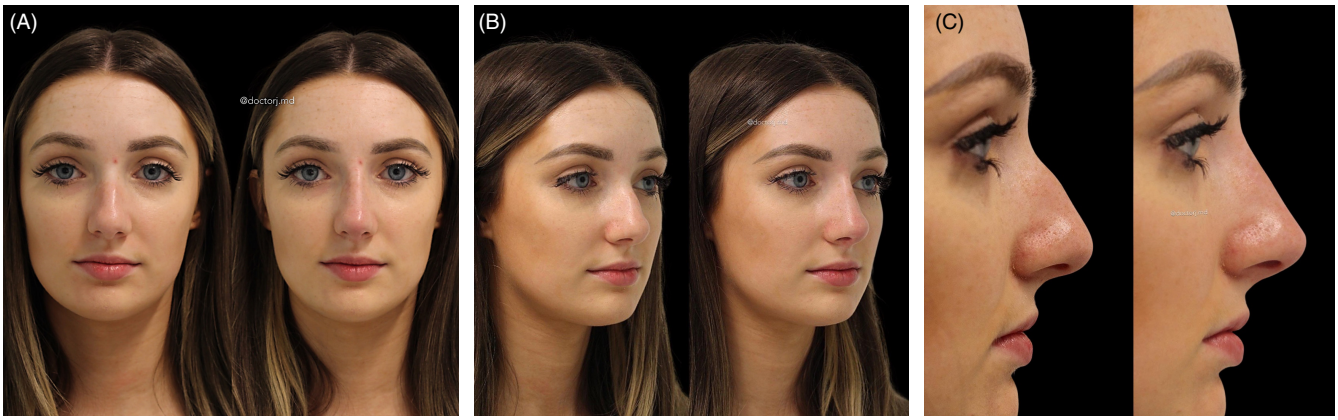


FIGURE 2 Nonsurgical rhinoplasty in a Caucasian female. This was a 23-year-old Caucasian female who presented requiring correction of a dorsal hump, a change in nasal projection, tip rotation and elevation, and adjustment to the columella. She was initially treated using 0.5 mL of VYC-25L, with a touch-up based on 0.15 mL. Parts A–C show her before treatment (left) and 6 weeks after treatment (right). Despite some residual asymmetry, she was satisfied with the result: FACE-Q Satisfaction with Nose, 38/40 (Rasch-transformed 83/100); Satisfaction with Outcome, 24/24 (Rasch-transformed 100/100).



FIGURE 3 Nonsurgical rhinoplasty in an East Asian female. This was a 26-year-old East Asian female who presented requiring improvement in nasal projection and tip elevation. She was initially treated using 0.4 mL of VYC-25L, with a touch-up based on 0.1 mL. Parts A–C show her before treatment (left) and 4 weeks after treatment (right). She was satisfied with the result: FACE-Q Satisfaction with Nose, 38/40 (Rasch-transformed 83/100); Satisfaction with Outcome, 24/24 (Rasch-transformed 100/100).

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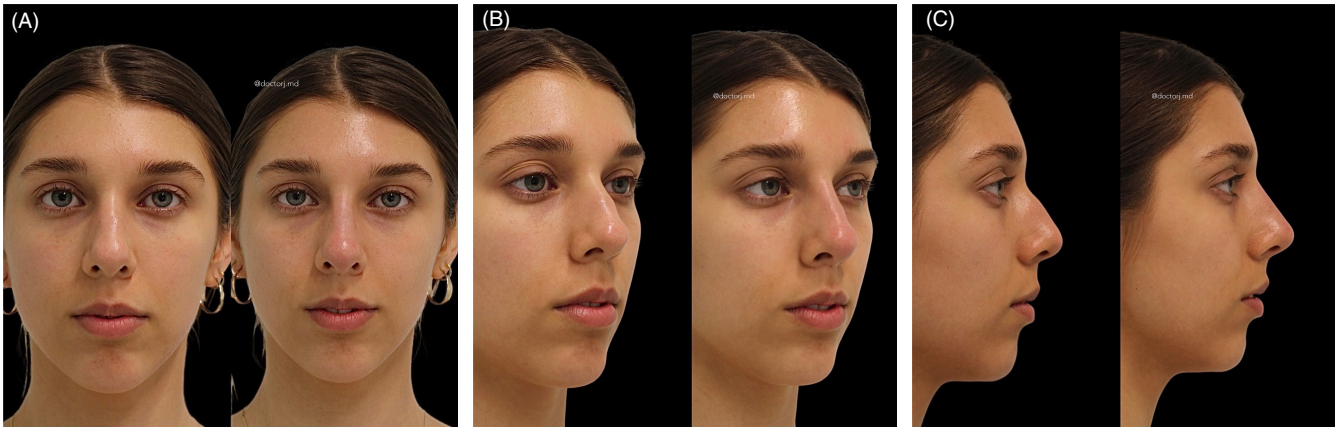


FIGURE 4 Nonsurgical rhinoplasty in a Hispanic female. This was a 24-year-old Hispanic female who presented requiring correction of a dorsal hump, a change in nasal projection, tip elevation, and adjustment to the columella. She was initially treated using 0.5 mL of VYC-25L, with a touch-up based on 0.15 mL. Parts A–C show her before treatment (left) and 6 weeks after treatment (right). She was satisfied with the result: FACE-Q Satisfaction with Nose, 39/40 (Rasch-transformed 90/100); Satisfaction with Outcome, 24/24 (Rasch-transformed 100/100).



FIGURE 5 Nonsurgical rhinoplasty in a Mediterranean female. This was a 30-year-old Caucasian (Mediterranean) female who presented requiring a change in nasal projection, correction of a dorsal hump, elevation and rotation of the tip, and adjustment to the columella. She was initially treated using 0.6 mL of VYC-25L, with a touch-up based on 0.15 mL. At 11 months, she received a second treatment using 0.4 mL of VYC-25L. Part A shows her before treatment (left), at 11 months (before her second treatment; middle), and 4 weeks after her second treatment (right). Parts B and C show her before any treatment and after her second treatment. She was satisfied with the result: FACE-Q Satisfaction with Nose, 38/40 (Rasch-transformed 83/100); Satisfaction with Outcome, 23/24 (Rasch-transformed 87/100).

discuss with the patient their goals and the potential limitations and risks of proceeding. In addition, it is preferable to use small volumes of product (administered slowly) and avoid overcorrection. Injections should be made deep and into the midline where possible, as this may reduce the probability of intravascular injection. However, there is a high degree of interpatient variability in the location of blood vessels in the nose, and other safety measures must therefore be adopted.[18–21] I favor the use of aspiration. This practice remains controversial among some clinicians,[22] but a recent expert consensus noted that while no single technique guarantees safety, many injectors may still wish to consider preinjection aspiration lasting 5–7 s.[23] Practitioners should also remain alert for signs of unexpected pain or blanching that can give a first indication of intravascular placement.[23] Furthermore, emergency plans should be put in place, alongside a workflow for immediate reversal and management of major complications in the unlikely event that they occur.

When treating the tip of the nose, it is particularly important to be vigilant for localized vascular occlusion. In the present cohort, this occurred with an event rate of 0.6% ($n = 3/492$), which closely matches that seen previously in the Harb study (0.5%).[14] These events occurred early—within 48 h—and were resolved easily using hyaluronidase plus steroid and aspirin treatment. It should be noted that all three cases were "suspected", and it is possible that they were not caused by vascular occlusion at all but rather by vascular compression (or indeed just heavy bruising). Nonetheless, risk reduction is essential when treating the nasal tip, given the tautness of the skin and the extensiveness of the microvasculature; I typically use a cannula in this area to reduce the chance of injecting into a vessel.

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FIGURE 6 Nonsurgical rhinoplasty in a Caucasian male. This was a 34-year-old Caucasian male who presented requiring a change in nasal projection, elevation of the tip, and adjustment to the columella. He was initially treated using 0.7 mL of VYC-25L, with a touch-up based on 0.2 mL. At 13 months, he received a second treatment using 0.5 mL of VYC-25L. Part A shows him before treatment (left), at 13 months (before his second treatment; middle), and 6 weeks after his second treatment (right). Parts B and C show him before any treatment and after his second treatment. He was satisfied with the result: FACE-Q Satisfaction with Nose, 38/40 (Rasch-transformed 83/100); Satisfaction with Outcome, 24/24 (Rasch-transformed 100/100).



FIGURE 7 Nonsurgical rhinoplasty in a Caucasian female. This was a 21-year-old Caucasian female who presented requiring a change in nasal projection, elevation and rotation of the tip, and adjustment to the columella. She was initially treated using 0.5 mL of VYC-25L, with a touch-up based on 0.1 mL. At 18 months, she received a second treatment using 0.3 mL of VYC-25L. Part A shows her before treatment (left), at 18 months (before her second treatment; middle), and 6 weeks after her second treatment (right). Parts B and C show her before any treatment and after her second treatment. She was satisfied with the result: FACE-Q Satisfaction with Nose, 38/40 (Rasch-transformed 83/100); Satisfaction with Outcome, 24/24 (Rasch-transformed 100/100).

TABLE 2 Adverse events.

Adverse event	Patients, *n* (%)
Early transient edema	492 (100.0)
Bruising	123 (25.0)
Residual asymmetry	18 (3.7)
Suspected localized vascular occlusion	3 (0.6)

Whatever injection devices are preferred by individual practitioners, it is important to systematize and standardize the overall approach. Alongside the methods described here, various different approaches to treating the nose have been proposed.[4,9,24–26] As well as minimizing the risk of complications, these may improve the reproducibility of results and thus help to optimize patient satisfaction.

Previous studies have suggested that patients often achieve high levels of satisfaction with nonsurgical aesthetic correction of the nose.[27,28] These treatments have also been linked with improvements in the first impression made on other people.[29] In the current analysis, patient satisfaction rates were high, as assessed using two standardized, validated FACE-Q tools.[12,13] This is the first large-scale study to evaluate satisfaction with nonsurgical rhinoplasty using VYC-25L, but the product has previously been associated with improvements in three different FACE-Q tools in a prospective trial of chin and jaw restoration.[6,7]

The present analysis assessed satisfaction at 4–6 weeks and did not specifically evaluate the longevity of outcomes.

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FIGURE 8 Management of suspected vascular occlusion. This was a 39-year-old Caucasian female treated using 0.4 mL of VYC-25L. She developed suspected localized vascular occlusion from injection of the nasal tip (shown in part A at 36 h postinjection). The complication was successfully resolved using hyaluronidase, as shown at 24 h (part B) and then at 4 weeks (part C).

TABLE 3 FACE-Q scores.

Rasch-transformed score	Patients (*N* = 492)
FACE-Q Satisfaction with Nose	
100%	122 (24.8%)
90%	212 (43.1%)
83%	158 (32.1%)
Mean	90.2%
FACE-Q Satisfaction with Outcome	
100%	463 (94.1%)
87%	29 (5.9%)
Mean	99.2%

Note: For FACE-Q Satisfaction with Nose and Satisfaction with Outcome, sum scores were calculated as totals out of 40 or 24, respectively, and were then converted into 'Rasch-transformed' scores on a scale of 0–100. For FACE-Q Satisfaction with Nose, a score of 40/40 equates to 100%, 39/40 equates to 90%, and 38/40 equates to 83%. For FACE-Q Satisfaction with Outcome, 24/24 equates to 100%, and 23/24 equates to 87%.

However, many of the included patients presented for reinjection at ≥18 months, having largely maintained their initial results. Moreover, data from a prospective study showed that outcomes with VYC-25L were highly durable—out to 18 months and beyond.[7] The rheologic and physicochemical characteristics of this product may be well suited to providing long-lasting effects.[5,6] Other HA fillers are available that may have comparable properties, and the techniques employed here are potentially transferable, although this would need to be confirmed in appropriately designed comparative studies.

There are of course some limitations to this work. Most importantly, it was a retrospective analysis of data from a single injector, and additional (prospective) studies may therefore be needed to confirm the safety and effectiveness of VYC-25L for treating the nose in the hands of other clinicians. Nonetheless, the study had two key strengths—the large size of the cohort (984 treatment sessions in 492 patients) and the ethnic diversity of those enrolled—which suggest the results may be broadly generalizable to experienced injectors wherever in the world they practice. A second limitation of this work is that no "objective" analyses of effectiveness were made, for example based on the evaluation of nasal angles; such assessments were not part of routine practice in this retrospective study but other investigators have demonstrated that VYC-25L treatment of the nose can yield meaningful changes in these measurements.[8] A third possible limitation is that the median follow-up of 11.1 months may not have allowed all delayed-onset AEs to be captured. However, a recent large-scale analysis with the related filler, VYC-20, found that such events were rare (~1% of patients) and occurred a median of 4 months post-treatment.[30] Thus, it is reasonable to consider that the duration of the present study was sufficient to capture most delayed AEs. A final potential limitation is that the two FACE-Q questionnaires were not anonymized and thus response bias cannot be ruled out.

In conclusion, use of the high-G' HA filler, VYC-25L, based on a systematic approach to treatment, was associated with high levels of patient satisfaction and low rates of clinically significant AEs in a large cohort of patients seeking nonsurgical rhinoplasty. The data suggest that such procedures are safe and effective when performed by highly skilled and well-trained practitioners using optimized filler products.

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CONFLICT OF INTEREST STATEMENT

Dr Jalali has been a speaker and sat on advisory boards for Allergan, and has been a speaker for Teoxane.

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DATA AVAILABILITY STATEMENT

Research data are not shared. Due to confidentiality and consent.

ETHICS STATEMENT

The author confirms that the ethical policies of the journal, as noted on the journal's author guidelines page, have been adhered to. The study was conducted in accordance with the Declaration of Helsinki, and all patients provided written informed consent prior to treatment.

PHOTO CONSENT STATEMENT

All of the patients whose photographs are used in this publication provided written informed consent.

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