

Hyaluronic Acid Gluteal Augmentation: New Marking and Application Technique

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Background: Current practices in gluteal augmentation with hyaluronic acid (HA) lack standardization. In this study, we propose a novel technique for volume assessment, marking, and the application of HA gluteal augmentation, focusing on achieving optimal results with minimal injection volume.

Methods: Twenty-six women received HA injections guided by markings based on anatomical landmarks and desired aesthetics. A laser level and specific points were used to define an ovoid-shaped base with 3 key areas (areas I, II, and III) for targeted HA distribution. A maximum volume of 100 mL (average 40.4 mL) was used for each patient.

Results: Hip circumference increased slightly after treatment. Immediately after HA application, the average increases in hip circumference at and 2 cm above the symphysis pubis level were 1.1 and 2.2 cm, respectively. Danilla D point increased by 1.7 cm immediately and by 2.6 cm at 1 month posttreatment. These changes were statistically significant (hip circumference: $\chi^2 = 51.1$, $P < 0.05$; Danilla D point: $\chi^2 = 47.60$, $P < 0.05$). We evaluated the reproducibility and teachability of the HA gluteal augmentation technique using a questionnaire (LEARN-Q HAGA) in which most participants reported a high degree of confidence and competence in performing the technique. Additionally, the desired aesthetic outcomes and patient satisfaction were evaluated using the GLUTEUS-Q questionnaire.

Conclusions: This standardized marking and application technique addressed the limited HA volume by strategically targeting specific gluteal regions. This approach aims to achieve optimal buttock augmentation with minimal complications. (*Plast Reconstr Surg Glob Open* 2025;13:e7252; doi: [10.1097/GOX.00000000000007252](https://doi.org/10.1097/GOX.00000000000007252); Published online 20 November 2025.)

INTRODUCTION

There are several methods of gluteal augmentation. One is camouflage by optimizing the waist-to-hip ratio, reducing the waistline through liposuction, and bringing the waist-to-hip ratio closer to 0.7, which is considered the ideal aesthetic ratio^{1,2} that visually gives us the perception

of gluteal augmentation. Fat grafting is the most commonly used procedure.³⁻⁵ One of the most effective methods for aesthetic results and volume increase is the placement of intramuscular gluteal prostheses.⁶⁻⁸ In post-bariatric patients, dermal-fat flaps are also used to increase gluteal volume.^{9,10} Currently, some authors consider hybrid augmentation using an intramuscular prosthesis and fat grafting in the subcutaneous tissue as the gold standard for gluteal augmentation.¹¹

However, for some patients, the use of hyaluronic acid (HA) in gluteal augmentation (HAGA) is a growing trend, and HA is an excellent alternative for providing immediate and predictable results. It is also a viable option for thin patients with low body fat or those who do not want to undergo a surgical procedure and prefer a less invasive method.

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Although HA has been successfully used for gluteal augmentation^{2,12} since 2007, its use has been met with skepticism.¹³ However, given the numerous novel approaches to applying HA, multiple systematic reviews conducted within the past 5 years have highlighted a growing body of evidence supporting good aesthetic outcomes with a low complication rate.^{13–17}

To prevent complications during gluteal augmentation with HA, the product should not be applied intramuscularly or in large quantities.¹³ Therefore, the volume that can be applied is limited. This raises the question of the optimal method for applying a limited HA volume. In this study, the lead author developed a volume needs assessment of the buttocks, translated into procedural markings, thereby optimizing the gluteal application of HA.

MATERIALS AND METHODS

This was an observational, retrospective, longitudinal study. The procedure was performed using nonanimal stabilized HA gel (Monalisa B Hyaluronic Acid Body Filler, 10-mL prefilled syringes; MONALISA-GENOSS, Seoul, Korea), with a 5501-injection dosage handle (BOMED Company, Nanjing, China), using a 12 cm × 1.8 mm blunt cannula with a single hole. A maximum of 5 syringes were used per buttock, yielding a maximum of 10 syringes per patient per session. Twenty-six female patients aged 21–46 years with a body mass index of 17–24 kg/m² underwent the procedure. Only ideal patients with the following characteristics were included: Mendieta type A buttocks, body mass index between 17 and 24 kg/m², total body fat percentage of 24% or less, realistic expectations, patients desiring a natural result, refusing a surgical procedure, good skin quality, at least 4–5 cm of gluteal panniculus pinch, no gluteal ptosis, and sufficient volume in the lower pole of the buttock. The exclusion criteria were previous treatment with unknown filler materials in the gluteal region, history of anaphylaxis or severe allergy, silicone gluteal implants, body dysmorphic disorder, hypersensitivity to any of the components of the filler material formula, active infection in other body regions, blood dyscrasias, recent use of antiplatelet agents, obesity, steatopygia, rheumatological diseases, immune hypersensitivity due to vaccines or recent COVID-19 infection, personal history of deep vein thrombosis, sequelae of infection of gluteal fat grafts, or insufficient volume in the lower pole of the gluteus.

The procedure was performed on an outpatient basis, and all aseptic measures were performed in a sterile environment. Between August 2022 and April 2024, measurements of hip circumference were taken at 3 points with a tape measure and a Bosch Professional GLL 2-12 laser level: at the symphysis pubis level, 2 cm above the symphysis pubis, and 2 cm below the symphysis pubis before, immediately after, and 1 month after the procedure (Fig. 1).

This study adhered to the ethical standards of the 1964 Declaration of Helsinki and its subsequent amendments. All patients provided written informed consent regarding the indications, contraindications, possible complications,

Takeaways

Question: To prevent complications during gluteal augmentation with hyaluronic acid (HA), the product should not be injected intramuscularly or in large volumes. Given these limitations, what is the optimal method for applying a limited volume of HA?

Findings: Hip circumference was measured using a tape measure and laser level at 3 points: at the symphysis pubis level, 2 cm above, and 2 cm below—recorded before, immediately after, and 1 month postprocedure. A slight increase in hip circumference was observed posttreatment.

Meaning: The proposed markings and techniques are safe, reproducible, teachable, and effective in achieving the desired aesthetic outcome, with minimal complications and scarring.

preoperative management, procedures, and postoperative treatment. The objective of this study was to demonstrate how this standardized marking and application technique addresses limited HA volume by strategically targeting specific gluteal regions and how this approach aims to achieve optimal buttock augmentation with minimal complications.

Volume requirement assessment was conducted by determining the upper level of the pubic symphysis using a laser with the patient in a standing position. The patient was then turned 180 degrees to ensure that the laser level was within the gluteal region. The point of maximal gluteal posterior projection or point C of Cuenca-Guerra and Quezada¹⁸ was marked at the symphysis pubis level, approximately 4–6 cm from the intergluteal cleft. From this point, we proceeded 1.5–2 cm in a direction superior to the point of maximum posterior projection in the aesthetically ideal gluteus, as described by Danilla et al.¹⁹ This point is referred to as the Danilla D point. The gluteal print and markings have an oval base similar to the aesthetically ideal buttocks often seen in thin individuals or those with muscular tone—characterized by an ovoid-shaped base that is wider at the lower ends and narrower at the upper ends from a vertical perspective.

Firm pressure was applied to the buttock with the back of the nondominant hand, pushing its volume upward from the lower area. A skin marker was used to symmetrically mark the upper end of the ovoid on both sides. The buttock print was delineated starting approximately 4 cm from the intergluteal cleft, continuing toward the upper end of the ovoid and laterally until the gluteus volume began to decrease. This continued toward the lower end at the level of the infragluteal fold and then ascended medially, reaching the starting point. This ovoid gluteal print was used for the marking.

The point of the maximal ideal posterior projection of the buttock (point D) was the center of a circle with a diameter of approximately 4–6 cm, designated as area II. Guided by this area, we identified the parts of the gluteal print with volume deficiencies along its periphery.

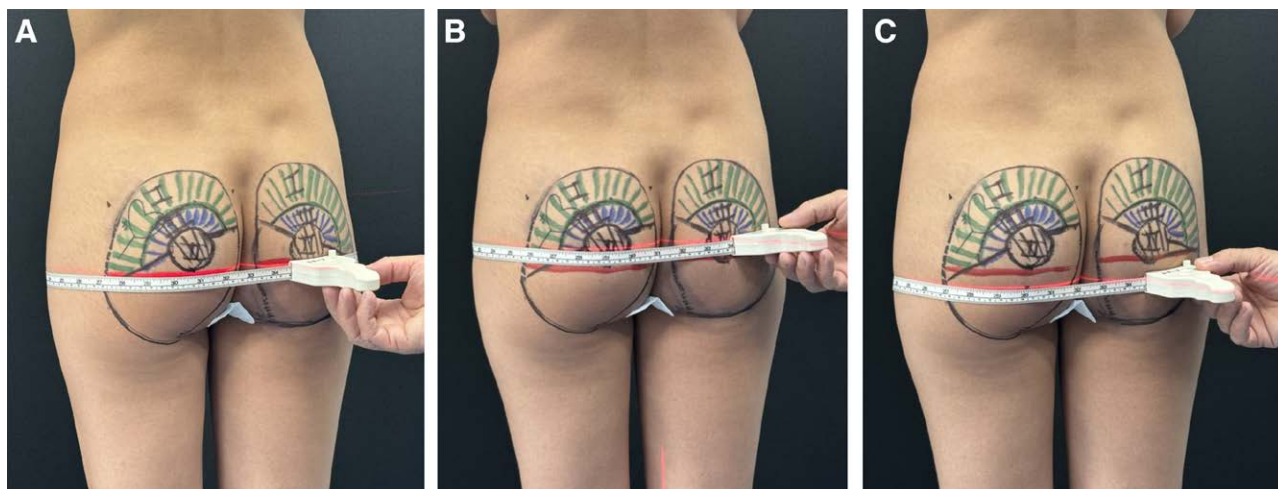


Fig. 1. Measurements were taken with a tape measure using a laser level at 3 points on the hip circumference. A, At the symphysis pubis level. B, 2 cm above the symphysis pubis level. C, 2 cm below the symphysis pubis level.

To identify volume-deficient areas, we examined the gluteal prints and determined the areas that required additional volume. Generally, the area in question begins at the upper medial frame, continues through the upper frame, and extends down the lateral frame to the junction between the upper two-thirds and the lower third of the gluteal print. Once an area with insufficient volume was identified, the equator of the buttocks was marked with a red line. HA was not applied below this limit for safety reasons. Other areas requiring additional volumes were also identified. The area that includes the entire medial, upper, and lateral frames was designated as area I and was marked in green. Area I requires as much filler as possible.

The area between areas I and II was designated area III and was marked in blue. This area does not require excessive filling volume, and the need for augmentation is determined by palpation and oblique examination of the contralateral side.

Area II was marked with a black marker. This area requires sufficient volume to achieve adequate posterior projections. In the superomedial and superolateral regions, 2 ports were marked, into which the cannula was injected to deposit HA. (See Video 1 [online], which shows the steps involved in marking the gluteal area for HA augmentation.)

These markings served as guides for the application of HA using a fat injection gun. After marking the procedure, we prepared the skin with a 2% chlorhexidine solution, dressed the area with sterile drapes, and performed subdermal infiltration of 2% lidocaine plus epinephrine in both ports. Once the ports were anesthetized, we made the port patent using a stab incision with a short 18G needle, piercing the dermis to facilitate the passage of a 12 cm × 1.8 mm blunt cannula with a single hole. The syringe was loaded onto an applicator.

In the lateral port, the cannula was introduced entirely into the upper part of area II. Using a retrograde injection technique, we deposited 1 mL of the body (or bodily) HA bolus in 2 planes. As some authors advise,^{20–22} the

deposition of the body HA in the gluteal region must be in the deep subcutaneous fat (below the Scarpa aponeurosis) rather than in the superficial fat. The deposition paths cross from the medial port. This honeycomb technique allowed us to add projections to the volumizing function of HA and simultaneously decrease the probability of filler migration. Using the same technique, we deposited the filler in area I, then in area III, and finally in any area that required a finishing touch, frequently in area II, and occasionally in area I.

The same procedure was performed on the contralateral side. Finally, we applied antibiotic ointment to the 4 ports and covered them with skin patches, which allowed us to obtain adequate posterior and superior projection of the buttocks (Figs. 2, 3). (See Video 2 [online], which displays the technique used to apply HA to the buttocks, along with an animation illustrating the honeycomb-like deposition of HA in the deep fat layer of the buttocks.)

STATISTICAL ANALYSIS

The Friedman test, a nonparametric method for analyzing repeated measures, was used to determine whether statistically significant differences existed in hip circumference and Danilla D point measurements at 3 time points: before the intervention, immediately after, and 1 month after the intervention. An alpha value of 0.05 was used to determine statistical significance. The Tukey post hoc test was used to perform pairwise comparisons between time points where significant differences were observed.

RESULTS

We analyzed 26 patients with an average age of 21 years and an average follow-up period of 12 days. The average, minimum, and maximum volumes of HA applied to each buttock were 40.4, 20, and 50 mL, respectively. The average, minimum, and maximum numbers of syringes used were 8, 4, and 10, respectively. Immediately after HA application, the average increases

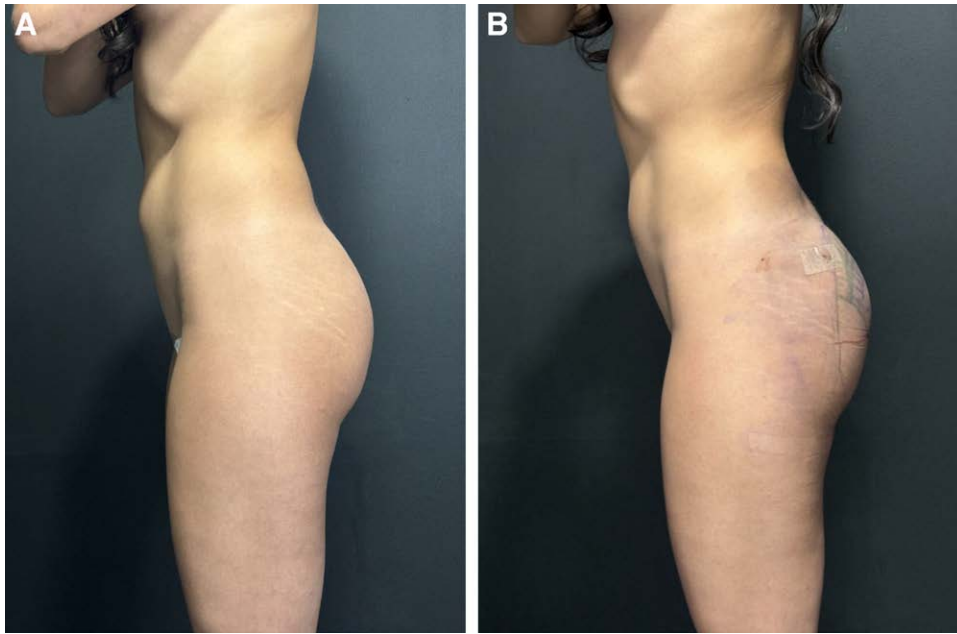


Fig. 2. Pretreatment and posttreatment photographs. A, Pretreatment photograph of a 29-year-old female patient before the total application of 10 syringes, each one containing 10 mL of Monalisa B HA Body Filler. B, Posttreatment photograph of the same patient immediately after the total application of 10 syringes, each one containing 10 mL of Monalisa B HA Body Filler.



Fig. 3. Pretreatment and posttreatment photographs. A, Pretreatment photograph of a 23-year-old female patient before the total application of 10 syringes, each one containing 10 mL of Monalisa B HA Body Filler. B, Posttreatment photograph of the same patient 2 months after the total application of 10 syringes, each one containing 10 mL of Monalisa B HA Body Filler.

in hip circumference at and 2cm above the symphysis pubis level were 1.1 and 2.2 cm (before HA, 90.17 cm; immediately after, 91.32 cm; and 1 month after, 92.35 cm at the symphysis pubis level), respectively. The Danilla D

point increased by 1.7 and 2.6 cm immediately after and 1 month after, respectively (before HA, 90.04 cm; immediately after, 91.75 cm; and 1 mo after, 92.63 cm) (Table 1). (See Video 3 [online], which displays the

Table 1. Mean and Confidence Interval of Patient Characteristics

Age, y	Patient Counts	Percentage	BMI (CI), kg/m ²	Vol. CC (CI)	Follow-up Days (CI)	No. Syringe
20–30	15	58	20.7 (19.48–21.86)	38.7 (32.97–44.36)	11.73 (8.38–15.08)	7
31–40	7	27	22 (20.87–23.13)	47.2 (43.65–50.74)	13.95 (10.28–17.61)	9
41–50	4	15	20.5 (18.46–22.54)	35 (29.34–40.66)	11.5 (6.28–16.72)	7
Total	26	100	21 (20.24–21.76)	40.4 (36.82–43.97)	12.29 (10.18–14.41)	8

BMI, body mass index; CI, confidence intervals; No. syringes, average syringes used for HA injections; Vol. CC, volume in cubic centimeters.

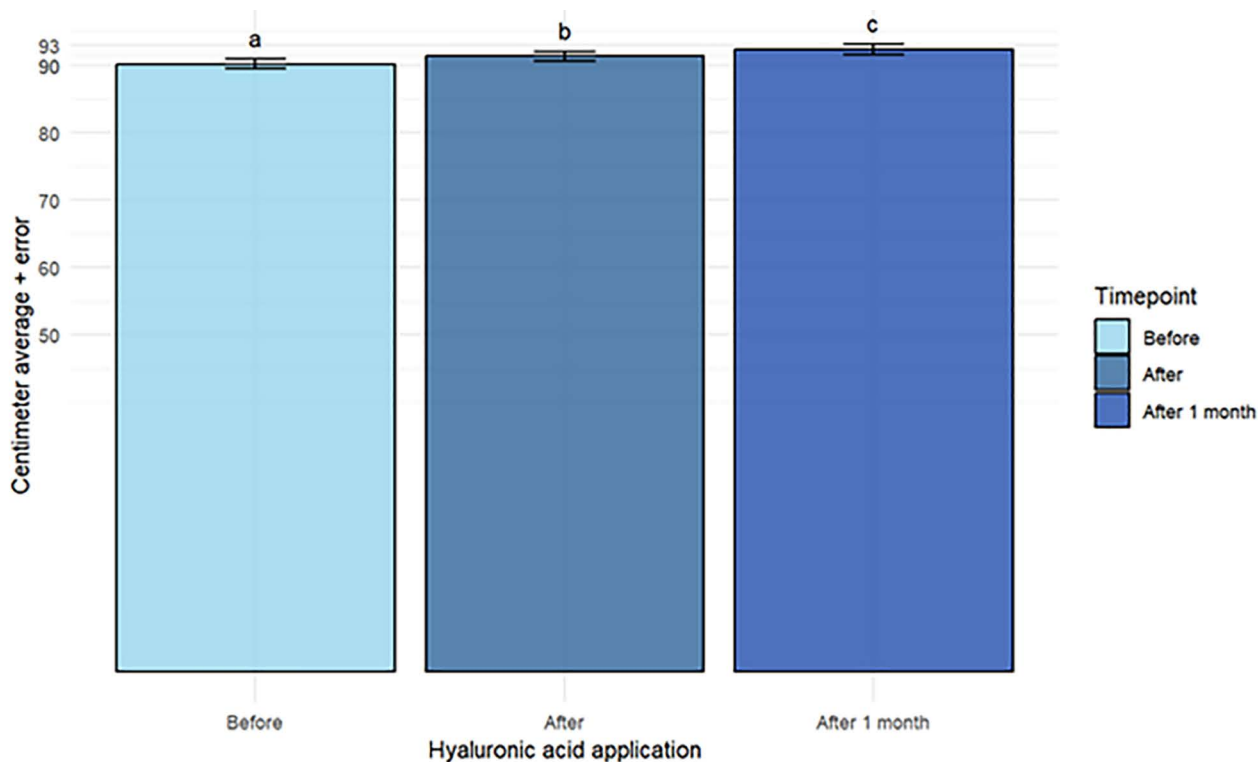


Fig. 4. Average gluteal circumference (in centimeters) measured at the hip before, after, and 1 month after the HA application. The same letter represents no statistically significant difference, and different letters represent a statistically significant difference.

immediate before-and-after results in a 29-year-old female patient with a total application of 10 syringes of 10 mL each of Monalisa B HA Body Filler.) (See Video 4 [online], which shows the results of a 23-year-old female patient before and 2 mo after the total application of 10 syringes of 10 mL each of Monalisa B HA Body Filler.) The test results yielded a χ^2 value of 51.1 with 2 degrees of freedom and a P value of 8.18×10^{-12} for hip circumference (Fig. 4), and a χ^2 value of 47.60 and a P value of 4.60×10^{-11} for the Danilla D point (Fig. 5).

Given the significant results of the Friedman test, we assumed that each time point was significantly different from the others. Therefore, significance letters “a,” “b,” and “c” were assigned to the time points “before,” “after,” and “after 1 month,” respectively, to reflect these differences. Throughout the study, no significant complications were reported, further validating the safety of the technique. The quantitative data obtained through the LEARN-Q HAGA and GLUTEUS-Q questionnaires strongly supported our conclusions regarding reproducibility, teachability, aesthetic outcomes, and safety.

Reproducibility and Teachability (LEARN-Q HAGA)

As depicted in Figures 6 and 7, the participants consistently reported high reproducibility and teachability of the technique. For Q12, 8 out of 10 respondents scored between 11 and 15 points, indicating a high level of confidence. For Q13, 6 out of 10 participants scored between 21 and 30, and 2 scored above 30, reflecting strong competence. For Q14 and Q15, all 10 participants rated the procedure as “highly reproducible” and applicable “in all cases,” respectively. Additionally, for questions Q2–Q11, 90% of responses were rated as “sufficient” (score 5), and the remaining 10% as “slightly sufficient” (score 4), demonstrating effective knowledge transfer.

Desired Aesthetic Outcomes and Patient Satisfaction (GLUTEUS-Q)

As illustrated in Figure 8, satisfaction levels were overwhelmingly positive. Out of the 17 evaluated questions, 15 showed that all 17 patients rated their satisfaction as level 5 (“very satisfied”). In the remaining 2 questions

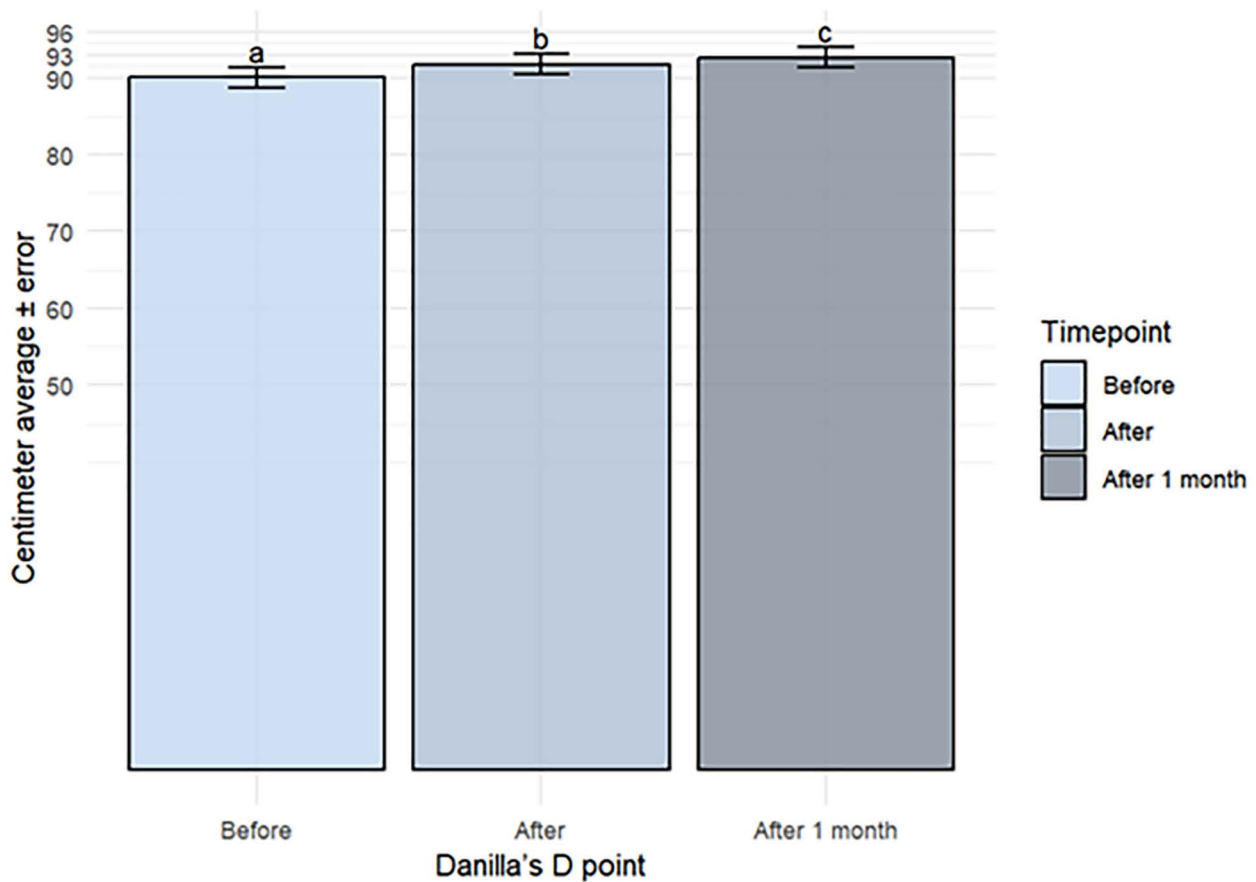


Fig. 5. Average gluteal measurement (in centimeters) at Danilla D point before, after, and 1 month following the HA application. The same letter represents no statistically significant difference, and different letters represent a statistically significant difference.

(Q5.1.1 and Q6.1.1), only 1 or 2 patients scored slightly lower at levels 1 or 2, but no score dropped below level 1. The overall average score across all GLUTEUS-Q items was 4.85 out of 5, indicating high patient satisfaction with gluteal volume, proportion, firmness, and overall aesthetic harmony.

DISCUSSION

To date, limited studies have been published on the markings and techniques of gluteal augmentation with HA.¹⁴ These 2 procedural steps are yet to be standardized. In December 2022, the markings were modified to move the point of maximal posterior projection upward, following the recommendations of Danilla et al.¹⁹

In the process of gluteal augmentation using fat transfer, it is possible to decrease the volume of the donor area, typically the abdomen, lower back, and waist, through liposuction while simultaneously increasing the volume of the buttocks with fat grafting. This approach optimizes the waist-to-hip ratio to bring it closer to 0.7.^{1,3-5} In gluteal augmentation with HA, the only option is to increase the volume of the gluteus without reducing the waist.

The purpose of this new marking was to avoid complications during the gluteal augmentation procedure with

HA because, for safety reasons, body HA should not be applied intramuscularly or in large quantities.^{12-15,23,24} Therefore, the volume of HA used for gluteal augmentation is limited. This marking was developed by identifying ideal patients, assessing their gluteal volume needs, and applying these assessments to optimize the application of HA in the body. According to the measurements, an immediate increase in gluteal volume was observed, which increased 1 month after treatment, consistent with the findings of several authors.^{12,25,26}

This is due to the hydrophilic nature of HA, which does not immediately become apparent. This effect occurred within the first 48 hours. By the third week, 80% of the inflammation subsided, but the increase due to the hydrophilic effect of HA persisted until lysis by hyaluronidase, delayed by the crosslinker, began.²⁵

Body HA also requires adequate tissue coverage.¹⁷ Some studies have shown greater expandability of the deep subcutaneous fat (below the Scarpa aponeurosis) than the superficial subcutaneous fat layer,²² and these concepts were followed for the development of the application technique; therefore, the HA is deposited in the deep layer of gluteal fat between the superficial aponeurosis and the aponeurosis of the gluteus maximus muscle,^{17,22} in 1 mL boluses to prevent the migration of HA, using a

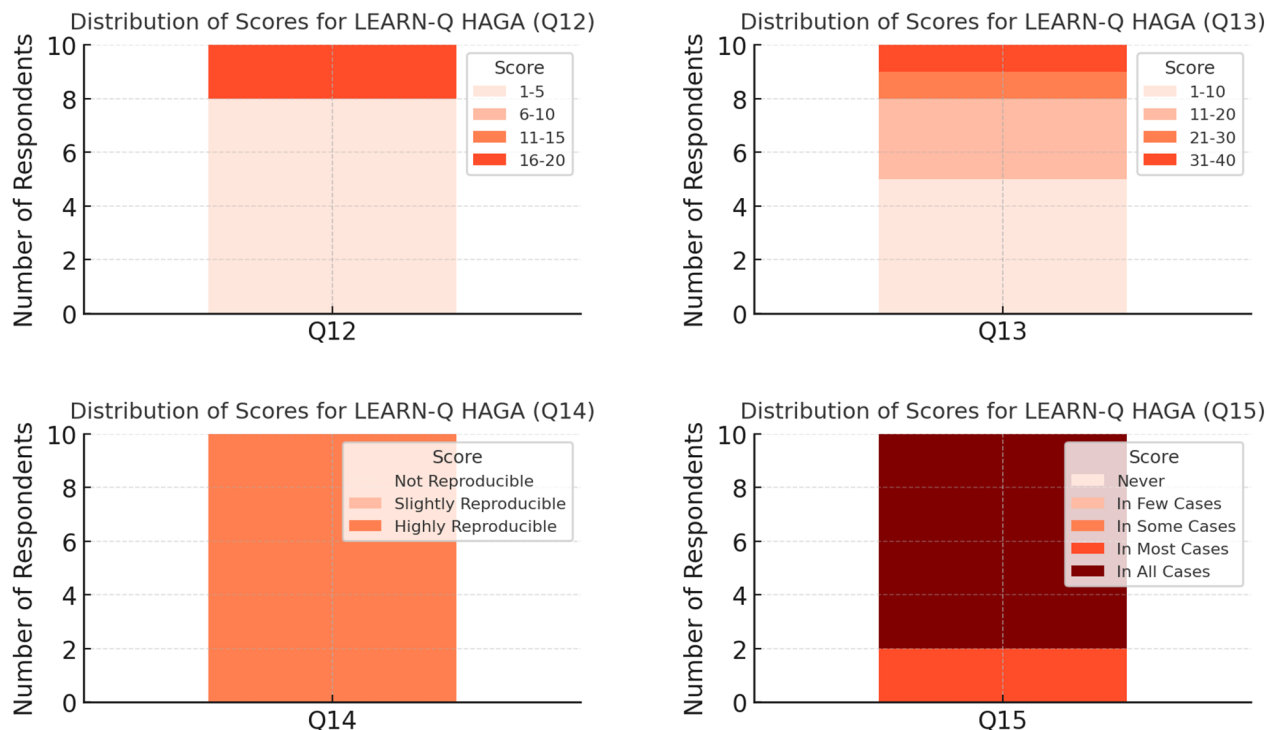


Fig. 6. Distribution of participant scores for the LEARN-Q HAGA questionnaire (Q12–Q15). Each stacked bar represents the number of respondents ($n = 10$) per score category. Questions Q12 and Q13 assessed confidence and competence in performing the technique, respectively, while Q14 and Q15 evaluated reproducibility and applicability. Participants consistently reported high reproducibility and teachability of the technique.

retrograde technique in 2 planes. This “honeycomb” technique, with small boluses in 2 planes, increases the volumetric capacity of the body HA, allowing small volumes to achieve a substantial increase in volume provided by the technique (see **Video 2 [online]**), unlike the application of fat grafts in the buttocks, which is performed using boluses or cylinders. Occasionally, ultrasonography is used when performing the procedure, but more often for academic purposes than as a safety measure.

The procedure was performed under local anesthesia or light intravenous sedation. When the aponeurosis of the gluteus maximus muscle is punctured, the patient complains, indicating that the needle is not in a safe position. Therefore, the use of ultrasound serves as a valuable safety measure, as it improves the accuracy and security of the procedures. We believe that the low frequency of immediate and early complications in our experience is due not only to the marking itself but also to the limited amount of HA applied, the appropriate selection of patients, and strict adherence to the procedure’s contraindications.

The duration and absorption of the filler have been previously described.^{2,12,14} However, owing to the lack of a long-term follow-up, we could not make a judgment on this aspect of the technique in the patients in the sample. Certainly, this result was temporary.¹⁶

During the practical part of the plastic surgeon training workshops on marking and application techniques, the students were accompanied by a tutor who provided

guidance and support throughout the procedure. We used the LEARN-Q questionnaire, designed based on the concepts of several authors, to assess skill acquisition and the learning curve.^{27–29} The LEARN-Q results were consistent with the technique’s reproducibility and short learning curve.

Patient satisfaction with the aesthetic results was assessed using the GLUTEUS-Q questionnaire based on the concepts described by Matioski et al,³⁰ yielding a high level of satisfaction with the results obtained. These findings reinforce the fact that the procedure consistently meets the expectations of both patients and practitioners, further supporting the claim that the markings and techniques used align with the criteria for ideal aesthetic outcomes. The structured approach used in both teaching (LEARN-Q HAGA) and assessment of results (GLUTEUS-Q) provides a robust framework for standardizing and optimizing outcomes.

Although this study has the limitations, including a small sample size, short follow-up, and lack of a control group, we consider its publication important because we have noticed a substantial increase in the commercial offer of body HA in Latin America and Europe, as well as a lack of articles emphasizing the safety aspects of the technique and showing the details of the marking and execution of the technique to perform it safely. The sample size was small, and the follow-up period was short. However, these safety issues should be addressed by other plastic

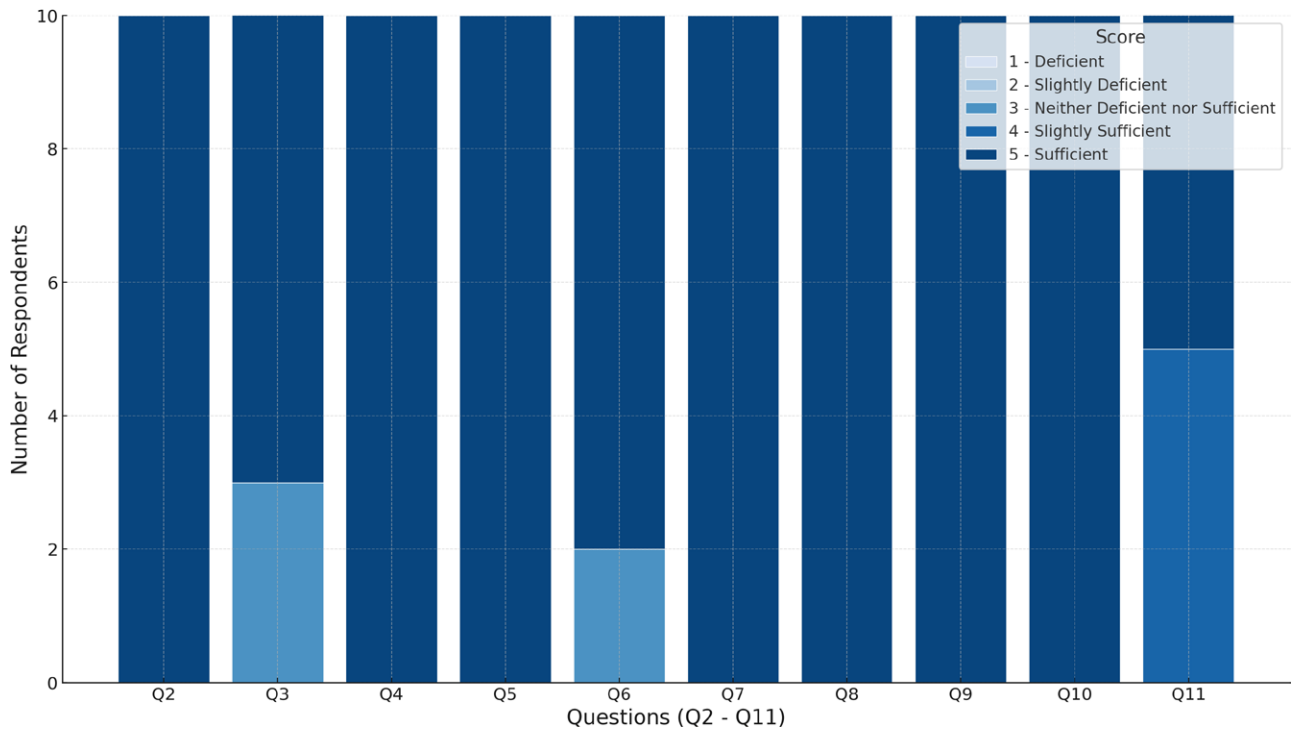


Fig. 7. Distribution of participant scores for LEARN-Q HAGA questions Q2–Q11. Each stacked bar represents the number of respondents (n = 10) per score category (1 = deficient, 5 = sufficient). Most participants rated their performance as sufficient (score 5), reflecting high understanding and reproducibility of the technique.

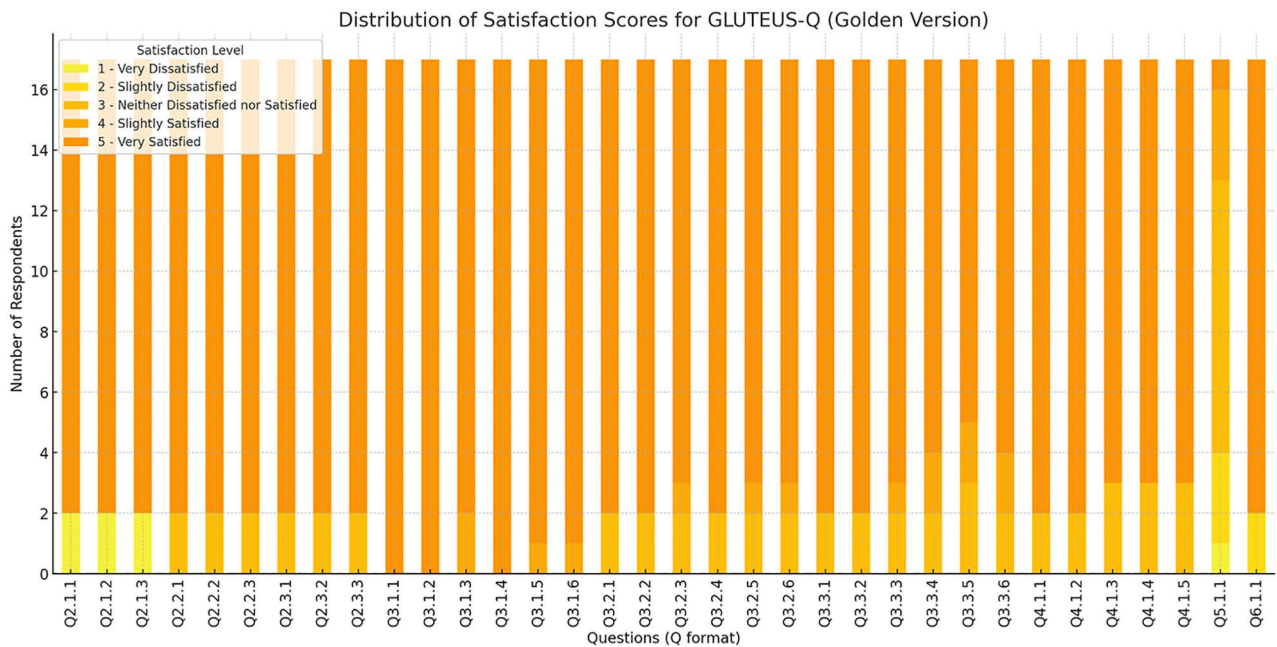


Fig. 8. Distribution of participant scores for LEARN-Q HAGA questions Q2-Q11. Each stacked bar represents the number of respondents (n = 10) per score category (1 = deficient, 5 = sufficient). Most participants rated their performance as sufficient (score 5), reflecting high understanding and reproducibility of the technique. High satisfaction scores on the GLUTEUS-Q indicate high patient satisfaction with the result.

surgeons as soon as possible. Publishing currently suits our objective of disseminating safety information regarding the technique and minimizing complications during

the learning curve. The described markings and techniques meet the criteria for an ideal aesthetic result, which is highly reproducible and teachable, obtains the desired

results, and is associated with minimal complications and scarring, as outlined by Colwell et al.³¹

CONCLUSIONS

Using this technique, it is possible to increase the volume of the gluteus and hip circumference, which can be measured 1 month after the procedure. However, this technique did not involve hip augmentation. Minimal immediate and early complications were observed with this approach.

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DISCLOSURES

Drs. Iribarren-Moreno, Pradel-Mora, and Garza-Cerna are consultants for MONALISA-GENOSS, Seoul, Korea, which paid for lectures and travel, but they have no other financial interest in the company or its products. Dr. Marin has no financial interest to declare in relation to the content of this article.

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