

Combined Technique with Hyaluronic Acid and Calcium Hydroxyapatite for the Treatment of Labia Majora Laxity: Case Report and Technical Description

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Abstract

Objective: To describe a novel combined technique using Hyaluronic Acid (HA) and Calcium Hydroxyapatite (CaHA) for the treatment of labia majora laxity and to report preliminary clinical results.

Methods: Female patients with labia majora and mons pubis laxity underwent a single session combined protocol: HA (0.5 mL/side) was injected superficially in the medial labia majora, and diluted CaHA (1:4, 5 mL total) was distributed laterally (1.5 mL/side) and in the mons pubis (1 mL in fan technique). Outcomes were assessed at baseline, 40, and 90 days with clinical examination and photographic documentation.

Results: All patients demonstrated clinical improvement of labia majora laxity, with natural aesthetic outcomes and high satisfaction at 90 days. Adverse events were limited to transient pain up to 5 days, with no major complications.

Conclusion: This combined approach, integrating HA volumization and CaHA biostimulation, appears to be a safe and effective option for correcting labia majora laxity. Controlled studies with objective measures and long-term follow-up are warranted.

Keywords: Hyaluronic acid; Calcium hydroxyapatite; Labia majora; Genital rejuvenation; Dermal biostimulators; Tissue laxity; Dermal fillers

Introduction

Volumization and rejuvenation of the labia majora have received increasing attention in aesthetic and regenerative gynecology. Complaints may be esthetic (hypotrophy, laxity, asymmetry) or functional, including friction, introital exposure, and discomfort during physical or sexual activity. The labia majora play an essential role in protecting the clitoris, urethral meatus, and vaginal introitus, contributing to sexual function. In situations such as hypoestrogenism (menopause) or significant weight loss, volume loss and tissue laxity occur, leading to relevant clinical symptoms [1].

Various techniques have been described, including autologous fat grafting [2,3], hyaluronic acid (HA) fillers [4-6], calcium hydroxyapatite (CaHA) [7], and hybrid approaches [8].

In genital procedures, evaluation in both the standing and lithotomy positions is crucial to identify pubic mound laxity, which, if left untreated, can cause undesirable product accumulation or irregularities of the labia majora. In such cases, treatment of the mons pubis is required [9].

This article aims to describe a novel combined technique using cross-linked HA for central volumization and diluted CaHA for lateral and mons pubis support, with an illustrative case report.

Materials and Methods

We describe two cases of patients presenting with laxity of the mons pubis and labia majora treated with a combination of hyaluronic acid and CaHA. For better assessment, the clinical examination was performed in the standing and lithotomy positions. The standing position is better for observing laxity of the mons pubis while the lithotomy position, it is possible to observe the degree of laxity and the exposure of urethral meatus and vaginal introitus. Informed consent was obtained from the participants. Photographic documentation was performed at baseline, and at 60- and 180-days post procedure.

Technique

After asepsis, a local anesthetic wheal was performed. Access was made 1.5 cm lateral to the anterior commissure with a 21G cannula. HA injection: Cross-linked HA with divinyl sulfone (DVS)

was injected using a 22G × 50 mm cannula, 0.5 mL per side, into the medial portion to approximate the labia majora in the superficial subcutaneous plane, as shown in figure 1.

CaHA, a compound of 30% calcium hydroxyapatite in a highly viscous carboxymethylcellulose gel (EvoSculpt) was applied to the lateral and distal regions of the labia majora and to the mons pubis, in the subdermal plane. In this region, dilution of the product in a 1:4 ratio is recommended, totaling 5 mL of solution, 2.5 mL per side, with 1.5 mL applied to the lateral portions of the labia majora and 1.0 mL in a fan technique to the mons pubis, using the same entry point as the HA, as illustrated in figure 1.

Results

At 150 days, the patients reported improvement in laxity, which was maintained for up to eight months, and high satisfaction. No major adverse events occurred. Mild pain lasting up to 5 days was reported. Outcomes were described as natural and harmonious (Figures 2 and 3).

Discussion

The demand for minimally invasive procedures for rejuvenation and volume restoration of the female intimate region (particularly the labia majora) has consistently increased in the past decade, driven by complaints of tissue hypotrophy/atrophy, functional discomfort, and esthetic concerns associated with aging, weight loss, and hypoestrogenism. Among the available options, hyaluronic acid (HA) fillers and calcium hydroxyapatite (CaHA) stand out for their combination of safety, predictable outcomes, and regenerative potential. Both have been studied individually and, more recently, in combined or hybrid approaches for this indication. Recent reviews and clinical series highlight esthetic and functional benefits of labia majora augmentation with HA and/or CaHA, with sustained results and an adverse event profile consistent with other anatomical areas [10,11].

Commercial HA gels differ in molecular weight, concentration, cross-linking architecture, and cohesivity, which determine rheological properties (e.g., elastic modulus G' , viscosity, yield

stress) directly related to clinical behavior (projection, moldability, resistance to deformation and migration). In general, gels with higher G' are preferred for deep planes and structural support, whereas more cohesive products with lower G' integrate better in superficial planes. Recent rheological reviews consolidate these correlations and provide standardized terminology for product selection according to anatomical indication [12,13].

For these patients, it was used a HA cross-linking with Divinyl Sulfone (DVS), through nucleophilic reactions in an alkaline medium, forming stable bridges that increase enzymatic resistance and gel longevity. DVS was one of the earliest cross-linking strategies applied to clinical HA gels, and biomaterials engineering literature details how pH variation, HA/DVS ratio, and microparticle size modulate swelling, network density, and rheological responses-directly influencing injectability and in vivo stability. Although BDDE (1,4-butanediol diglycidyl ether) is currently the most widely used cross-linker, HA-DVS studies (including ACHA-DVS variants) demonstrate high mechanical performance and greater gel retention when synthesis is optimized, supporting its plausible clinical safety provided purity and residuals are controlled [14-16]. Likely due to this mechanical performance and gel retention, small filler volumes achieved persistent results. In some cases, up to 1 mL per side can be used, particularly in patients with less severe labia majora laxity where greater volume is desirable.

CaHA is a biostimulatory filler composed of calcium hydroxyapatite microspheres (30-40 μm) suspended in a viscous carboxymethylcellulose (CMC) gel carrier. After injection, there is immediate volumetric effect (from the carrier) followed by neocollagenesis (mainly types I and III collagen), elastin synthesis, and angiogenesis, leading to dermal remodeling over months. Recent narrative and systematic reviews reinforce this macrophage-fibroblast mechanism and position CaHA as a regenerative treatment with broad clinical use in face, hands, and increasingly in body areas- including the vulvar region in specific protocols [17,18].

For the female intimate region, emerging evidence-including a multicenter prospective study with HA for labia majora hypotrophy and a narrative review with hybrid HA/CaHA filler case reports-indicates volumetric improvement and relief of functional symptoms (e.g., friction, sensitivity, discomfort), with results maintained up to 12 months and low rates of adverse events when anatomical knowledge and proper injection technique are respected. These data support the rationale for combining cross linked HA (for immediate contour and softness, with reology adjustable via DVS) with CaHA (for late dermal thickening and tissue quality improvement), seeking synergy between immediate effect and progressive regenerative benefit [10].

Regarding safety, the most common complications with HA and CaHA in the intimate region mirror those known in other areas (edema, ecchymosis, transient pain). Late events (nodules, biofilm/hypersensitivity) are rare and can be mitigated with proper technique, product selection, and aseptic protocols; for CaHA, recent guidelines propose algorithms for managing non-inflammatory nodules, emphasizing the importance of dilution and correct deposition plane. For HA-DVS, principles of residual control and synthesis validation apply as with other cross-linking strategies, and manufacturer quality is decisive for final benefit-risk [19].

Thus, the central hypothesis of this work is that the combined approach of cross-linked HA with DVS, selected for its rheological and cohesive properties suitable for the region, associated with CaHA

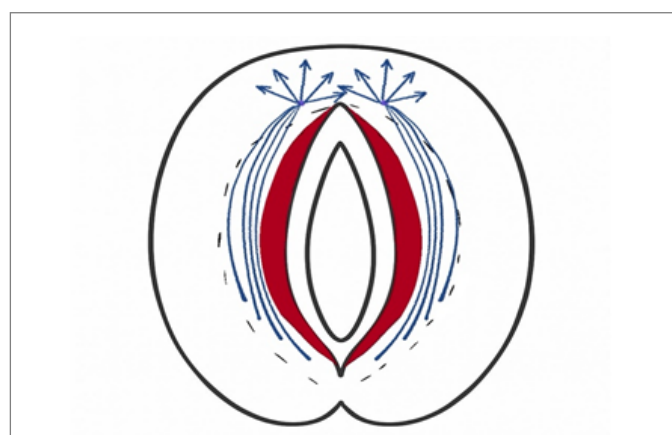


Figure 1: Schematic illustration demonstrating the application technique: Hyaluronic acid (HA), represented in red, is injected into the superficial subcutaneous plane in the medial portion of the labia majora, while calcium hydroxylapatite (CaHA), represented in blue, is injected into the subdermal plane in the lateral portions of the labia majora and the mons pubis.

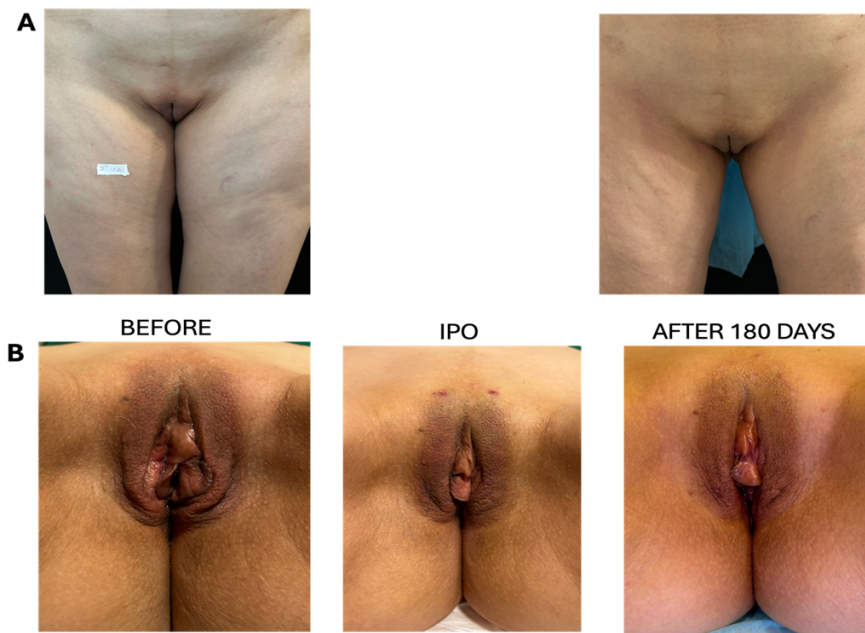


Figure 2: Before and after treatment. A- standing position; B- lithotomy position. Note the improvement of labia majora and mons pubis laxity after 180 days of the procedure.



Figure 3: Before and after treatment. A- Standing position; B- Lithotomy position. Note the improvement of labia majora and mons pubis laxity after 180 days of the procedure.

(Sculpt), for its sustained bio-stimulatory effect, can provide superior and durable natural esthetic-functional results for labia majora hypotrophy/atrophy correction, with an acceptable safety profile when performed by trained professionals using standardized technique and careful patient selection. Well designed clinical studies with objective measures (e.g., elastography/US, validated comfort and function scales) and ≥ 12 -month follow-up are required to strengthen evidence for this indication [8].

Conclusion

The combined technique using cross-linked HA and diluted CaHA proved to be safe and effective for treating labia majora and mons pubis laxity, promoting natural results, improved laxity, and high satisfaction in the short term. Prospective controlled studies with objective measures and long-term follow-up are necessary to validate and consolidate evidence for this approach.

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References

1. Cucinella L, Tiranini L, Cassani C, Martini E, Cumetti A, et al. (2024) Insights into the vulvar component of the genitourinary syndrome of menopause (GSM). *Maturitas* 186: 108006.
2. Pelosi MA, Pelosi MA (2008) Augmentation of the labia majora with autologous fat transfer. *J Am Coll Surg* 207: S36.
3. Salgado CJ, Tang JC, Desrosiers AE (2012) Use of dermal fat graft for augmentation of the labia majora. *J Plast Reconstr Aesthet Surg* 65: 267-270.
4. Hexsel D, Dal'Forno T, Caspary P, Hexsel LC (2016) Soft-Tissue Augmentation With Hyaluronic Acid Filler for Labia Majora and Mons Pubis. *Dermatol Surg* 42: 911-914.
5. Fasola E, Gazzola R (2016) Labia Majora Augmentation with Hyaluronic Acid Filler: Technique and Results. *Aesthet Surg J* 36: 1155-1163.
6. Zerbinati N, Haddad RG, Bader A, Rauso R, D'Este E, et al. (2017) A new hyaluronic acid polymer in the augmentation and restoration of labia majora. *J Biol Regul Homeost Agents* 31: 153-161.
7. van Loghem J (2017) Use of calcium hydroxylapatite for augmentation of labia majora and mons pubis. *Surg Res Lett Dermatol Clin Res* 2: 10-13.
8. Acevedo A, Parra AM, Amado AM, Dicker V, Castelanich D, et al. (2025) Labia Majora Rejuvenation with Hybrid Filler: A Narrative Review of the Literature and Report of Two Cases. *J Cosmet Dermatol* 24: e70074.
9. Abdelhafez AHK, Latif MA, Askalany A, Gamal A, Ali WM, et al. (2025) The aesthetic and functional outcome of monsplasty in women who experienced abdominoplasty. *Egypt J Plast Reconstr Surg* 49: 59-168.
10. Boucher F, Eychenne C, Gurriet B, Berreni N, Berrocal J, et al. (2025) Evaluation of the Efficacy and Safety of Hyaluronic Acid Injection for Volume Restoration of the Labia Majora: ESOLANE study. *Int Urogynecol J* 36: 1243-1253.
11. Vilela CL, Faria GEL, Boggio RF (2024) Treatment of atrophy of the labia majora: calcium hydroxylapatite or hyaluronic acid? *Aesthetic Plast Surg* 48: 472-477.
12. Fundarò SP, Salti G, Malgapo DMH, Innocenti S (2022) The Rheology and Physicochemical Characteristics of Hyaluronic Acid Fillers: Their Clinical Implications. *Int J Mol Sci* 23: 10518.
13. Perera GG, Argenta DF, Caon T (2024) The rheology of injectable hyaluronic acid hydrogels used as facial fillers: a review. *Int J Biol Macromol* 268: 131880.
14. Shimojo AAM, Pires AMB, Lichy R, Santana MHA (2015) The Performance of Crosslinking with Divinyl Sulfone as Controlled by the Interplay between the Chemical Modification and Conformation of Hyaluronic Acid. *J Braz Chem Soc* 26: 578-587.
15. Ibrahim S, Kang QK, Ramamurthi A (2010) The impact of hyaluronic acid oligomer content on physical, mechanical, and biologic properties of divinyl sulfone-crosslinked hyaluronic acid hydrogels. *J Biomed Mater Res A* 94: 355-370.
16. Gwak SJ, Lee YB, Lee EJ, Park KH, Kang SW, et al. (2023) The use of acetylation to improve the performance of hyaluronic acid-based dermal filler. *Korean J Chem Eng* 40: 1963-1969.
17. Aguilera SB, McCarthy A, Khalifian S, Lorenc ZP, Goldie K, et al. (2023) The Role of Calcium Hydroxylapatite (Radiesse) as a Regenerative Aesthetic Treatment: A Narrative Review. *Aesthet Surg J* 43: 1063-1090.
18. van Loghem J (2025) Calcium hydroxylapatite in regenerative aesthetics: mechanistic insights and mode of action. *Aesthet Surg J* 45: 393-403.
19. McCarthy AD, van Loghem J, Martinez KA, Aguilera SB, Funt D (2024) A Structured Approach for Treating Calcium Hydroxylapatite Focal Accumulations. *Aesthet Surg J* 44: 869-879.