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03 (63) 2022 : 001-007 • RESEARCH ARTICLE

Value of injection of fat in the labia majora for genital rejuvenation in cases with post menopausal women: A retrospective study

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SUMMARY

Background: Postmenopausal women commonly experience labia majora atrophy, prolapse, and aesthetic concerns, which may negatively impact genital self-image and quality of life (QoL). Autologous fat grafting has emerged as a potential solution, though limited data exist on its psychosocial outcomes. This study aimed to evaluate the efficacy and safety of labia majora augmentation using autologous fat grafting in improving genital self-image and QoL among postmenopausal women.

Patients and methods: This retrospective study included 40 postmenopausal women (mean age: 55.2 ± 7.3 years; BMI: 29.0 ± 3.4 kg/m²) with labial volume loss, wrinkles, or prolapse, treated between January 2021 and January 2022. The women were recruited from gynecology, geriatrics, psychiatry & mental health outpatient clinics in a big private hospital. Exclusion criteria included prior labial procedures or sexual inactivity. Fat harvested from the thighs/abdomen was processed into microfat (20–30 cc injected per side). Outcomes were assessed using the Female Genital Self-Image Scale (FGSIS) and SF-36 survey preoperatively and at 4 months postoperatively. Paired t-tests analyzed changes (SPSS v22; significance: $p<0.05$).

Results: Total FGSIS scores improved significantly (17.56 ± 1.2 vs. 19.62 ± 1.4; $p<0.001$), driven by marked increases in satisfaction with genital appearance ($p<0.001$), comfort with partner viewing ($p<0.001$), and healthcare examinations ($p= 0.003$). No improvements were observed in perceptions of smell, function, or embarrassment ($p > 0.05$). SF-36 scores revealed significant gains in role limitations (physical: 20.5 ± 11.0 to 50.5 ± 9.5; emotional: 20.4 ± 13.5 to 54.5 ± 14.4), energy (32.5 ± 14.5 to 52.7 ± 18.4), social functioning (34.6 ± 21.4 to 68.5 ± 28.8), pain (24.8 ± 20.2 to 70.5 ± 25.5), and general health (40.8 ± 17.5 to 62.3 ± 16.4) ($p<0.001$ for all). Physical functioning remained unchanged (100 ± 0.0 pre/post). One patient (2.5%) experienced minor complications (edema/ecchymosis).

Conclusion: Labia majora augmentation with autologous fat grafting significantly enhances genital self-image and QoL in postmenopausal women, with minimal complications. While aesthetic and intimacy-related concerns improved, functional and olfactory perceptions remained unaffected. The procedure is a safe, effective option for addressing age-related labial changes, though long-term studies are warranted.

Keywords: Labia majora augmentation; Autologous fat grafting; Postmenopausal women; Older women; Genital self-image; Geriatric patients

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Word count: 3716 **Tables:** 02 **Figures:** 01 **References:** 13

Received: 21.02.2022, Manuscript No. gpmp-25-166456; **Editor assigned:** 23.02.2022, PreQC No. P-166456; **Reviewed:** 05.05.2022, QC No. Q-166456; **Revised:** 23.06.2022, Manuscript No. R-166456; **Published:** 30.06.2022

INTRODUCTION

Aesthetic gynecologic surgery is gaining popularity among women and physicians. The interest in applications related to genital rejuvenation and aesthetic procedures has seen a significant rise in recent years. This growing popularity is reflected in the increasing number of procedures performed worldwide [1]. According to the American Society of Plastic Surgeons, the number of labiaplasty procedures performed in 2019 increased by 9% compared to the previous year. This rise indicates a growing trend in female genital aesthetic surgeries, reflecting increased interest and acceptance of such procedures. The upward trend may be influenced by factors such as increased media coverage, evolving societal perceptions of genital aesthetics, and greater awareness of available surgical options. As more individuals seek these procedures for cosmetic or functional reasons, the demand for labiaplasty continues to grow, highlighting the importance of ongoing research and advancements in minimally invasive techniques within this field [2].

Postmenopausal women are significant in this context due to hormonal changes, notably reduced estrogen levels, affecting the genital area. These shifts decrease collagen and elastin, leading to tissue thinning, loss of labial adipose tissue, and skin wrinkling. As a result, postmenopausal women experience more sagging and age-related changes than premenopausal women, impacting comfort and aesthetics. Understanding these factors is crucial for tailoring treatments like labiaplasty to meet the specific needs of postmenopausal women [3].

In postmenopausal women, fat injection into the labia majora is an autologous procedure to restore volume and improve aesthetic appearance. Due to hormonal changes during menopause, there is a natural loss of adipose tissue in the labia majora, leading to sagging, wrinkling, and a less youthful contour. Fat injection involves harvesting fat from other body areas, such as the abdomen or thighs, through liposuction, processing it, and then injecting it into the labia majora to replenish lost volume. This procedure enhances the aesthetic appeal by restoring a plump and youthful shape and improves support and comfort by re-establishing tissue thickness. Fat injection is considered a safe, natural, and effective method for rejuvenating the labia majora in postmenopausal women [4-6].

In the present study, we aimed to evaluate the effectiveness of fat injection in the labia majora augmentation to assess the satisfaction using the Female Genital Self-Image Scale (FGSIS).

PARTICIPANTS AND METHODS

This retrospective analysis was conducted at our private hospital from January 2021 to January 2022. The participating women were recruited from gynecology, geriatrics, psychiatry & mental health outpatient clinics. Before beginning data collection, we obtained approval from the hospital's Ethics Committee to ensure compliance with ethical standards. We assessed the medical records of all patients who underwent surgical procedures during this timeframe and extracted pertinent data from the hospital's database per ethical guidelines. Informed consent was acquired from each patient upon admission, allowing the use of their clinical information for research purposes, by the principles of the Declaration of Helsinki. To maintain confidentiality, all data were anonymized and managed with the utmost care, ensuring no personally identifiable information was revealed in the published findings. The study's procedures adhered entirely to ethical standards, prioritizing the protection of patient privacy throughout the research.

The eligibility criteria comprised 40 postmenopausal women who reported issues such as prolapse of the labia majora, a decrease in volume of the labia majora, deep skin wrinkles, and dissatisfaction with their aesthetic appearance.

Exclusion criteria: Sexually inactive women. Those who had previously had hyaluronic acid filler application for labia majora augmentation, had fat injection to the labia majora, underwent labia majora surgery, or had radiofrequency or Polydioxanone (PDO) thread application were excluded from the study.

Demographic data of all participants were noted, and general health & mental health were evaluated. A comprehensive geriatric assessment was conducted for elderly participants.

Primary outcome: The improvement in the total score of satisfaction using the Female Genital Self-Image Scale (FGSIS), which was used and performed before and four months after the procedure.

The Female Genital Self-Image Scale (FGSIS) is a psychological assessment tool designed to measure a woman's perceptions, attitudes, and feelings about her genitalia. It helps to assess aspects of body image related to female genitalia, including comfort, satisfaction, and acceptance. The FGSIS is a 7-item questionnaire that has respondents rate each question on a 4-point response scale (strongly disagree [1 point], disagree [2 points], agree [3 points], or strongly agree [4 points]). An individual's total score is obtained by adding the scores of individual questions, ranging from 7 to 28. A higher score indicates a more positive genital self-image and significantly correlates with a woman's sexual function, sexual behavior, and their sexual and genital health-care behaviors [7].

Secondary outcomes included quality of life (SF-36) and intra- and post-operative complications. All complications noted on postoperative 3rd day (ecchymosis of labia majus, ecchymosis of clitoral hood, tenderness in the pubic area and pain at the vaginal entrance points) were recorded.

Evaluation of improvement of the quality of life symptoms using a 36-item short-form survey (SF-36). The SF-36 survey was used and performed before and 4 months after the procedure. It included the following scoring: physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, energy/fatigue, and general health perceptions. Role limitations refer to how an individual's physical or emotional health problems interfere with their ability to perform routine daily activities, work, or social roles.

The scoring process for the SF-36-Item Health Survey involves two steps. Initially, the pre-coded numerical responses are transformed according to the scoring guidelines provided in step 1. It is important to note that all items are scored so that higher scores indicate a better health status. Each item is scored on a scale from 0 to 100, with 0 representing the lowest possible score and 100 the highest, and the scores reflect the percentage of the maximum possible score achieved. In the second step, responses on the same scale are averaged to generate the eight scale scores. Any items left unanswered (missing data) are excluded from calculating the scale scores. Therefore, the scale scores represent the average of all answered items within each scale.

Procedure

All participants underwent a vaginal physical examination and a high vaginal swab to rule out any infections.

Anesthesia may be either spinal or general, based on the patient's preference and overall health, which is discussed in detail with the anesthesiologist. Liposuction is performed using a size 4 cannula to harvest fat. The preferred areas for fat extraction include both sides of the lateral thighs to ensure symmetry, followed by the love handles and the abdominal apron. These sites are discussed with the patient, as they may have specific areas that concern them and could benefit from liposuction. Typically, we collect around 100-150 cc of fat, which is filtered and processed into microfat, stored in 10 cc syringes. From 150 cc of fat, approximately 80 cc of microfat can be extracted. The injected fat is mainly placed in the lower part of the vulva to facilitate proper drainage in case of infection. However, some surgeons may hesitate to inject in this area due to concerns about losing fat *via* gravity. In our experience, there is often no fat loss when injected this way. We usually administer 20-30 cc of fat into each vulva, as excessive injection can lead to fat necrosis. It's crucial to understand that the success lies in how much fat survives after injection, as injecting an excessive amount can compromise the blood supply, leading to necrosis (**Fig. 1.**). After injection, a gentle massage ensures uniform distribution and prevents irregularities. Patients are advised to avoid tight clothing following the procedure. Antibiotics are prescribed for 3-4 days. A follow-up appointment is scheduled for day 3 to check for swelling and bruising, again on day 7 to evaluate any irregularities or hardness, and a third visit at 3 weeks to monitor for infection or fat necrosis. It is not uncommon for patients to experience enlarged inguinal lymph nodes. A detailed assessment is carried out at the 3rd month to complete the questionnaire.

Fig. 1. A) Syringe with Microfat, **B)** Preoperative vulval appearance, **C)** Injection of Microfat in the labia Majora, **D)** Postoperative Labia majora appearance after fat injection.

Statistical analysis

The gathered data were coded, organized, and analyzed statistically using IBM SPSS Statistics (Statistical Package for Social Science) software version 22.0 from IBM Corp, Chicago, USA, 2013. A P value<0.050 significance level is considered significant, while higher values are deemed non-significant. The P value serves as a statistical indicator of the likelihood that the observed results in a study could have occurred by chance. The independent t-test and paired t-test were utilized for comparisons.

RESULTS

In the study group of 40 postmenopausal women, the average age is 55.2 years with a standard deviation of 7.3 years, and the average Body Mass Index (BMI) is 29.0 kg/m² with a standard deviation of 3.4 kg/m². Among these patients, one individual experienced postoperative complications such as skin edema, ecchymosis, or a palpable nodule. The average duration of the surgical procedure was 35 minutes, with a standard deviation of 5.2 minutes.

Tab. 1. compares seven FGSIS (Female Genital Self-Image Scale) parameters before and after intervention, along with statistical analysis results. Overall, most parameters show significant improvements postoperatively, indicating enhanced genital self-image. Specifically, parameters 1, 2, 3, and 6 demonstrate statistically significant increases in scores, with p-values less than 0.01, highlighting strong evidence of improvement. Parameter 3 exhibits the highest t-value (6.91) and the most considerable p-value (<0.001), suggesting a substantial change in that aspect. Parameters 4, 5, and 7 show no significant differences, with p-values greater than 0.05, indicating that these aspects did not significantly change after the intervention. The total score reflects a statistically significant overall improvement (p<0.001), supporting the efficacy of the treatment in improving female genital self-image.

This data suggests that while certain aspects of self-image are markedly improved, others may require further focus or different approaches.

Regarding the SF-36, the physical-functioning subscale remained at the maximum possible value before and after surgery (100.0 ± 0.0 *vs.* 100.0 ± 0.0, P = 0.999), indicating no measurable change. By contrast, every other SF-36 domain improved markedly after the operation. Role limitations due to physical health rose from 20.5 ± 11.0 pre-operatively to 50.5 ± 9.5 post-operatively (P<0.001), and role limitations due to emotional problems increased similarly (20.4 ± 13.5 *vs.* 54.5 ± 14.4, P<0.001). Patients reported substantially greater vitality, with the energy/fatigue score climbing from 32.5 ± 14.5 to 52.7 ± 18.4 (P<0.001), while emotional well-being improved from 49.5 ± 11.2 to 64.6 ± 11.1 (P<0.001). Social functioning almost doubled (34.6 ± 21.4 to 68.5 ± 28.8, P<0.001), pain scores showed the most significant absolute gain (24.8 ± 20.2 to 70.5 ± 25.5, P<0.001), and general health perceptions rose from 40.8 ± 17.5 to 62.3 ± 16.4 (P<0.001). These findings demonstrate highly significant and clinically meaningful improvements across physical, emotional, social, and pain-related domains after surgery, except for physical functioning, which was already at ceiling pre-operatively (**Tab. 2.**).

DISCUSSION

The demand for labia majora augmentation among post-menopausal women has sharply increased due to biological and psychosocial factors. Estrogen withdrawal during menopause leads to significant vulvar changes, such as loss of fat and collagen, resulting in "deflated," wrinkled labia majora that can exacerbate symptoms like dryness and dyspareunia. This altered appearance often reinforces feelings of aging and sexual unattractiveness, impacting self-esteem during a challenging period for intimacy [8].

Augmentation with autologous fat restores volume and contour, enhancing the aesthetic appeal linked to youthfulness. The procedure is quick, performed under local anesthesia, and avoids systemic hormones, making it suitable for women who prefer not to use estrogen therapy. High satisfaction rates and positive online experiences have normalized this option, explaining the growing interest among post-menopausal women in labia majora augmentation [5].

Tab. 1. Comparison between preoperative and postoperative FGSIS (Female genital self-image scale).

FGSIS parameter *	Preoperative mean ± SD	postoperative mean ± SD	T test	P value	Significance
1	**3.22 ± 0.5**	**3.51 ± 0.6**	2.6	0.009	Significant
2	**2.93 ± 0.4**	**3.32 ± 0.5**	4.29	<0.001	Highly Significant
3	**1.89 ± 0.5**	**2.65 ± 0.6**	6.91	<0.001	Highly Significant
4	**2.27 ± 0.7**	**2.18 ± 0.5**	-0.74	0.46	Not Significant
5	**2.08 ± 0.7**	**2.27 ± 0.6**	1.56	0.12	Not Significant
6	**2.46 ± 0.6**	**2.75 ± 0.4**	3.03	0.003	Significant
7	**2.93 ± 0.5**	**2.94 ± 0.6**	0.09	0.93	Not Significant
Total	17.56 ± 1.2	19.62 ± 1.4	6.69	<0.001	Highly Significant

*1: I feel positively about my genitals
*2: I am satisfied with the appearance of my genitals
*3: I would feel comfortable letting a sexual partner look at my genitals
*4: I think my genitals smell fine
*5: I think my genitals work the way they are supposed to work
*6: I feel comfortable letting a health-care provider examine my genitals
*7: I am not embarrassed about my genitals

Tab. 2. Comparison between preoperative and postoperative SF-36 (Quality of life questionnaire).

SF 36	Preoperative N=40 mean ± SD	postoperative N=40 mean ± SD	T test	P value	Significance
Physical functioning score PF	100.0 ± 0.0	100.0 ± 0.0	0	0.999	Not significant
Physical health score	20.5 ± 11.0	50.5 ± 9.5	18.4	<0.001	Highly significant
Emotional problems	20.4 ± 13.5	54.5 ± 14.4	15.4	<0.001	Highly significant
Energy/fatigue	32.5 ± 14.5	52.7 ± 18.4	5.46	<0.001	Highly significant
Emotional well-being score	49.5 ± 11.2	64.6 ± 11.1	6.06	<0.001	Highly significant
Social functioning score	34.6 ± 21.4	68.5 ± 28.8	5.98	<0.001	Highly significant
Pain score	24.8 ± 20.2	70.5 ± 25.5	-8.8	<0.001	Highly significant
General health score	40.8 ± 17.5	62.3 ± 16.4	-5.67	<0.001	Highly significant

Our results and their interpretation

Among the 40 post-menopausal participants, the mean age was 55.2 ± 7.3 years, and the mean BMI was 29.0 ± 3.4 kg/m². Fat injection in the labia majora was brief (35 ± 5.2 min) and largely uneventful; only one woman developed transient skin oedema, bruising, or a small palpable lump.

An evaluation of the Female Genital Self-Image Scale indicated notable improvements after surgery. Out of the seven items assessed, four items—specifically items 1, 2, 3, and 6—demonstrated significant enhancements (P<0.01), with item 3 exhibiting the most significant change (t = 6.91, P<0.001). This improvement is likely associated with factors related to aesthetic satisfaction, such as comfort with genital appearance, a sense of perceived "normality," and self-assurance in intimate situations. Items 4, 5, and 7 remained essentially unchanged in their significance (P > 0.05), indicating that they likely pertain to functional or relational factors such as sexual satisfaction, comfort in physical activities, or concerns related to partners. This stagnation points to two main issues: first, the limitations of the procedure itself, as fat grafting primarily focuses on volume and aesthetic improvements rather than resolving functional problems like vaginal dryness or dyspareunia, which are prevalent among post-menopausal women. Second, it highlights the necessity for a more comprehensive approach to care, suggesting that matters regarding sexual functioning or relational interactions might benefit from additional treatments, including hormonal therapies and counseling.

Nevertheless, the composite FGSIS score increased decisively (P<0.001), confirming an overall enhancement in genital self-perception, although some facets may still warrant additional attention.

Quality-of-life outcomes paralleled these findings. The SF-36 Physical Functioning domain stayed at its pre-operative ceiling (100 ± 0), yet every other domain improved sharply. Role-physical, Role-emotional, Energy/ Fatigue, Emotional Well-being, Social Functioning, Pain, and General Health all climbed by 15–46 points, each with P<0.001. The most dramatic absolute change was seen in pain, followed by social functioning. These data demonstrate that the intervention is quick, safe, and delivers substantial, clinically meaningful benefits across multiple physical, emotional, and social dimensions, except for a domain already maximized before treatment. Fat grafting is more than just a cosmetic procedure; it significantly impacts psychosocial well-being by enhancing genital self-image, which can improve pain perception, social engagement, and emotional resilience. The notable reduction in pain illustrates the connection between physical discomfort and psychological distress, suggesting that addressing genital dissatisfaction can alleviate "biopsychosocial pain" linked to negative body image. Furthermore, improvements in emotional and

social functioning indicate that the procedure may help break cycles of avoidance behavior, encouraging greater participation in life and relationships.

Comparison of our results to different studies

Labia majora augmentation remains an emerging procedure, with its modern application first documented in 2007 by Felicio, who pioneered the application of autologous fat grafting to address volume deficiencies in the labia majora. Following this initial report, multiple methodologies have evolved and diversified. The technique has since gained global traction, as evidenced by published studies spanning diverse regions, including Asia, Europe, Africa, and the Americas, reflecting its expanding adoption in clinical practice [9].

Lipofilling has emerged as the predominant method for labial augmentation. Studies report a broad range of injected fat volumes, spanning 18 mL to 120 mL per session, with variations depending on clinical goals. The procedure involves administering fat grafts into targeted regions, including the mons pubis and distinct areas of the labia majora (anterior, lateral, and posterior). A layered injection approach is recommended to optimize fat retention, distributing grafts across tissue planes. This technique serves dual purposes: cosmetic enhancement—volumizing hypotrophic or aesthetically suboptimal labia—and reconstructive applications, such as restoring anatomy after surgical ablation. Lipofilling achieves a natural contour in reconstructive cases and improves skin texture and scar remodeling while avoiding new incisions—a critical advantage for patients with prior scarring or compromised tissue [4,10].

A reconstructive case reported by Vogt, et al. [5] highlights the successful use of autologous lipotransfer for labia majora augmentation in a patient who had previously undergone unsuccessful reconstructive attempts with local flaps. Autologous lipotransfer, a technique involving fat extraction from a donor site (e.g., abdomen or thighs), processing it, and reinjecting it into the target area, offers distinct advantages in genital reconstruction. Unlike local flap procedures, which can create additional scars and alter tissue dynamics, fat grafting avoids new incisions, preserving the natural architecture of the perineal region. This was critical for the patient, as prior flap surgery had led to scarring and suboptimal outcomes, compounding physical and psychological distress.

Some researchers opt to integrate different aesthetic methods for treating the female genitalia. Felicio shared his 17 years of experience with over 500 labial procedures, emphasizing the simultaneous injection of fat into the labia majora and labia minora. Cihantimur and Herold [10] conducted genital enhancement by combining procedures such as labia minora reduction, labia majora augmentation, laser brightening, liposuction of the mons pubis, and vaginal tightening.

Researchers employed various techniques for labial augmentation, specifically through hyaluronic acid injections for the labia majora. Each session involved 2 to 6 mL of hyaluronic acid at 19 to 20 mg/mL concentrations. Injections were delivered into the subcutaneous tissue, sometimes reaching the deeper Dartos fascia. Additional treatments could occur every 2 to 4 months if more volume were needed. Generally, the procedures resulted in mild and temporary side effects, such as redness, swelling, bruising, and nodules [11,12].

Compared to lipofilling, hyaluronic acid offers several advantages: it has a lower risk of allergic reactions and can be reversed with hyaluronidase if necessary. Retouching can occur as soon as 2 to 4 months after the initial injection, while lipofilling requires a wait of 4 to 6 months. Fat grafts experience some volume loss over time, making it necessary to wait longer to evaluate the final results and determine if further augmentation is needed [13].

In older women, mental health significantly influences sexual interest and satisfaction, which is linked to their sexual self-image, self-worth, feelings of depression and loneliness, as well as cognitive abilities. Studies indicate that communication training can foster open, honest discussions between healthcare providers and elderly female patients. Providers should focus on asking open-ended questions, while patients are encouraged to share their symptoms despite feelings of anxiety. Our multi-disciplinary team approach, incorporating expertise from plastic surgery, geriatrics, and psychiatry, can be easily adopted in clinical settings to enhance the sexual quality of life for women across all age groups.

STRENGTHS AND LIMITATIONS OF THE STUDY

Strengths of the Study Using standardized assessment tools like the FGSIS and SF-36 improves the consistency and comparability of measures related to psychosocial aspects and quality of life. Additionally, concentrating on postmenopausal women focuses on a population that has been relatively overlooked, highlighting their unique anatomical and psychological issues. The study has several limitations The retrospective design of the study presents a higher likelihood of selection bias and confounding variables, and the absence of a control group hampers the ability to draw causal conclusions. Furthermore, the small sample size of 40 participants limits the statistical power, which affects the overall generalizability of the findings and may prevent the detection of rare complications or minor effects. Additionally, with only a 4-month follow-up period, the study fails to assess long-term outcomes like fat retention and the sustainability of improvements in self-image.

CLINICAL IMPLICATION OF THE STUDY

This study demonstrates that autologous fat grafting for labia majora augmentation in postmenopausal women safely improves genital self-image (particularly aesthetic satisfaction and intimacy-related comfort) and enhances quality of life, with minimal complications. Clinicians can consider this procedure for patients distressed by age-related labial atrophy or prolapse, emphasizing its psychosocial benefits. However, expectations should be managed regarding unchanged perceptions of genital function or smell. Short-term efficacy supports its use, but long-term durability remains unproven. Multidisciplinary care integrating psychological counseling may optimize

outcomes. Further research is needed to validate these findings in broader populations and assess fat retention objectively.

Recommendation for future research: Further research should include prospective trials with larger cohorts, extended follow-up, objective fat retention imaging, and comparisons to alternative techniques to validate long-term efficacy and broaden applicability across diverse populations.

CONCLUSION

Autologous lipotransfer to the labia majora is a safe, efficient method to enhance post-menopausal genital self-image, particularly in aesthetic domains. However, its limited impact on functional or relational aspects underscores the need for individualized, multimodal care to address the complex interplay of anatomical and psychosocial factors in genital well-being.

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