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A Novel Zero-Retention Suturing Technique in Labiaplasty: Eliminating Suture-Related Complications and Optimizing Aesthetic Outcomes

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Abstract

Background Most of the labiaplasty suturing methods do not involve the removal of subcutaneous tissue sutures, which are associated with suture-related adverse events. A novel labiaplasty suturing technique was presented to avoid suture-related adverse events and to improve surgery efficiency.

Methods Between September 2019 and April 2021, labiaplasty for 68 patients were performed using this new suturing technique. All sutures were removed 7 days postoperatively and all patients were followed-up and evaluated three months postoperatively.

Results Overall, 127 labiaplasties were performed using the new suturing technique. The mean operation times were 42.2 ± 12.6 min (range: 30–60 min) for bilateral labiaplasty (59 cases) and 26.7 ± 8.3 min (20–40 min) for unilateral labiaplasty (nine cases). At the postoperative follow-up evaluations, the incisions had healed well without suture-related adverse effects, marginal scarring was inconspicuous, and no notches were detected at the edge of incision. Sixty-two patients (91.2%) had a score of ≥ 21 points on the female genital self-image scale. Five patients experienced some bleeding (mild bleeding in the early postoperative period, oozing blood from the incision, which can be stopped by applying local pressure) at the edge of incision within 72 h postoperatively, which improved after moderate compression treatment. One patient experienced unilateral, epithelial loss (approx. 3 mm^2, full thickness) of the labia minora five days postoperatively; this healed 20 days post-operatively. Three patients complained of mild pain (visual analogue scale score: 1–2) on suture removal.

Conclusions We introduced a novel, safe, simple, and clinically feasible suturing technique for labiaplasty. This new method effectively helps to avoid suture-related adverse effects and obtain a well-shaped edge for the labia minora.

Level of Evidence IV This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors www.springer.com/00266.

Keywords Labiaplasty · Suture technique · Labia minora · Sutures · Suture-related adverse effects

Introduction

Over recent years, and with the progression of social culture, the attitude of women towards sexuality has changed; one consequence of this is the increasing popularity of genital aesthetics. Labiaplasty, first described by Hodgkinson et al in 1984 [1], is currently the most common genital cosmetic procedure for women [2]. A greater number of patients worldwide are opting for labiaplasty, and the number of procedures being performed is increasing [3–5]. Studies have shown that more than half of women seeking labiaplasty want to improve the appearance of the labia minora [6, 7], and in some of the studies, aesthetics was cited as one of the reasons by almost all women [8, 9]. Other non-aesthetic and functional reasons

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for labiaplasty include pain and discomfort during sexual intercourse, hygiene issues, irritation during certain physical activities such as bicycling, jogging and similar sports, and discomfort when wearing tight clothing [7, 9, 10]. The morphology of the labia minora is complex and exhibits significant individuality; as such, numerous surgery-based reconstructive approaches have been developed for labiaplasty over recent years. The suturing technique is a critical aspect of the surgical process.

Although a diverse range of suturing techniques have been developed for the labia minora, a standardized approach has yet to be adopted. The existing literature describes two main layers of sutures: skin sutures and subcutaneous tissue sutures [11]. Skin suturing typically involve the use of absorbable threads for interrupted [12–15] or continuous suturing techniques [16–18], although some studies have described the use of non-absorbable sutures [18, 19]. Subcutaneous sutures are usually placed using absorbable threads by applying the interrupted suturing technique [20], although some studies describe the use of the continuous suturing technique [21]. Many of the published studies did not describe the removal of subcutaneous sutures, as absorbable thread was used. However, the retention of subcutaneous sutures can lead to a potential increase in suture-related adverse events following labiaplasty, including suture rejection, tenderness at the knots in the subcutaneous tissue, notch formation in the labia minora edge, and suture granuloma [11, 22]. Due to the lamellar structure of the labia minora, if intermittent suturing is performed using an absorbable thread without removal from the marginal skin, then there is likely to be an increase in the cutting effect of the sutures on the relatively fragile edge of the labia minora, thus leading to an unsmooth edge, the formation of notches, or local tissue hyperplasia at the edge of the labia minora (Fig. 1A and B).

Previously, we also used absorbable thread with intermittent or continuous suturing techniques, without the removal of sutures in the subcutaneous tissue. Nevertheless, as the number of surgeries being performed increased, we observed that some patients experienced suture-related adverse events, including rejection of the thread, redness, pain, and repeated breakage of the sutures. These complications persisted until the suture material was expelled on its own or removed by the surgeon (Fig. 1C–F). Therefore, we modified our suture method to ensure the 'zero retention' of sutures in the tissue, thus helping to avoid suture-related complications. In the present study, we describe a new suturing technique for labiaplasty, in which the incision in the subcutaneous tissue and skin is closed using continuous sutures and all sutures are removed postoperatively. This method reduces the operation time and generates good edge appearance with no residual sutures remaining in the tissues, thereby helping to avoid suture-related adverse events and achieve a good edge on the labia minor.

Methods

Patients and Follow-up

Between September 2019 and April 2021, we performed labiaplasty for 68 patients using a novel, continuous suturing technique. Fifty-nine of these patients underwent labiaplasty for the first time, while nine patients underwent a second round of surgery to repair problems arising from a previous labiaplasty. On the day of surgery, we obtained a range of basic and contact information for each patient *via* a unified two-way follow-up mobile application ('App'). Patients were asked to use the 'app' promptly to contact the clinical team in case of any postoperative discomfort. At the time of suture removal (seven days and three months postoperatively), patients were followed-up in person or by videoconference with the 'App'. All patients completed the female genital self-image scale (FGSIS) questionnaire [23], preoperatively, and then at three months preoperatively. The total score of the FGSIS, ranging from 7 to 28 points, was calculated. Higher scores on the FGSIS indicate a more positive genital self-image; in the present study, we considered a total score $\geq$ 21 to be satisfactory. All procedures were performed in compliance with ethical standards and in accordance with the principles of the world medical association helsinki declaration. The study protocol was approved by the Review Board of our Hospital, (ethical approval number: 2024(369)). Informed consent was obtained from all patients.

Suture Method and Post-operative Management

All procedures were performed in our outpatients clinic under local anesthesia with patients in the lithotomy position. All surgeries were performed by the same surgeon. Lidocaine (0.5%), containing 1:200,000 epinephrine, was used as the local anesthetic, with infiltration of the entire operative site. Several procedures were performed, including simple edge resection (n = 19), wedge resection (n = 21), modified de-epithelialization (n = 5), and the combined method (n = 23) [15].

All incisions were closed with the new continuous suture method. The incision in the subcutaneous tissue was closed with either a 6-0 absorbable poliglecaprone thread (Monocryl, Ethicon, Inc., Somerville, NJ) or a 6-0 braided absorbable thread (Polysorb, Covidien, Inc., Minneapolis, MN). The suture was inserted through the skin at one end of the incision, leaving a section of the thread unknotted outside the skin. Then, continuous suturing of the

Fig. 1 Notch at the edge of the labia minora and suture-related adverse reactions. **A** Notch at the edge of the labia minora in a 28-year-old female; **B** Notch at the edge of the labia minora in a 32-year-old female; **C** Pustule caused by residual suture knots in the subcutaneous tissue (25-year-old); **D** A subcutaneous tissue sutures penetrating the skin surface in a 34-year-old female; **E** A subcutaneous tissue sutures penetrating the skin surface in a 31-year-old female; **F** A subcutaneous tissue sutures penetrating the skin surface in a 29-year-old female

subcutaneous tissue was performed, while maintaining the suture in the same tissue layer to ensure accurate alignment of the incision. Excessive tension in the sutures was avoided before the subcutaneous tissue was closed as this ensured that the sutures outside the skin were not stretched into the subcutaneous tissue (Fig. 2A–D). The suture was threaded through the subcutaneous tissue to the skin at the caudal end of the incision. A certain amount of tension was provided to pull the suture at the end of the incision, to tighten the suture in the subcutaneous tissue and buttress the subcutaneous layer of the incision (Fig. 2A–D).

Skin sutures were placed using 5-0 absorbable polyglactin thread (Vicryl Rapide, Ethicon, Inc., Somerville, N.J.). The skin suture was knotted with the subcutaneous suture left outside the skin at the end of the incision, and the skin was then continuously sutured. At the end of the suture, the thread was moderately tightened and knotted with the subcutaneous suture at the end of the incision (Fig. 3). For incisions $\leq$ 5 cm in length, the sutures were knotted at the start and end of the incision (Fig. 3A, B). Incisions $>$ 5 cm in length were closed with segmental continuous sutures. The subcutaneous suture was passed through the skin in the middle of the incision, leaving a section of the thread outside the skin, which was then knotted with the skin suture during the subsequent closure of the skin (Fig. 3C, D). It is important that the sutures are not tied too tightly, and the thread should be relatively loose.

Following surgery, we applied erythromycin ointment to the incision site, which was then dressed with a sterile sanitary pad. Patients were discharged on the same day and were asked to take a hip bath for 15 min, twice daily, in a solution of potassium permanganate (1: 5000), from day 2 to day 7 postoperatively. Patients were also told to avoid exercise, masturbation, and intercourse for eight weeks postoperatively.

Both subcutaneous and skin sutures were removed seven days postoperatively. The incision was disinfected with iodophor before removing the threads and skin sutures were removed by intermittent cutting of the thread

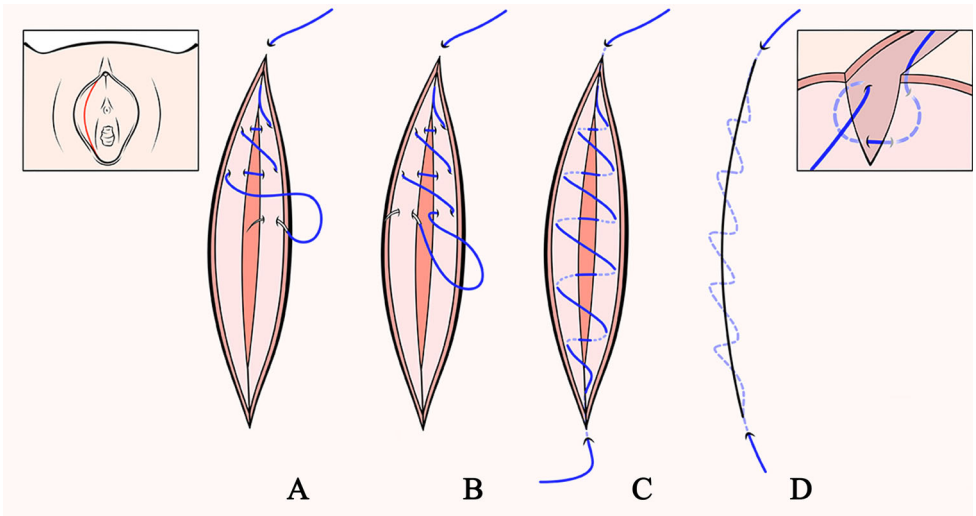

Fig. 2 An illustration of the continuous subcutaneous tissue suturing method. The incision was closed with either a 6-0 absorbable poliglecaprone thread (Monocryl, Ethicon, Inc., Somerville, NJ) or a 6-0 braided absorbable thread (Polysorb, Covidien, Inc., Minneapolis, MN). **A** The suture was inserted through the skin at one end of the incision, leaving a section of the thread unknotted outside the skin; **B** Then, continuous suturing of the subcutaneous tissue was performed while maintaining the suture in the same tissue layer to ensure accurate alignment of the incision. Excessive tension in the sutures was avoided before the subcutaneous tissue was closed to ensure that the sutures outside the skin were not stretched into the subcutaneous tissue; **C** The suture was threaded through the subcutaneous tissue to the skin at the caudal end of the incision; **D** A certain amount of tension was provided to pull the suture at the end of the incision to tighten the suture in the subcutaneous tissue and buttress the subcutaneous layer of the incision

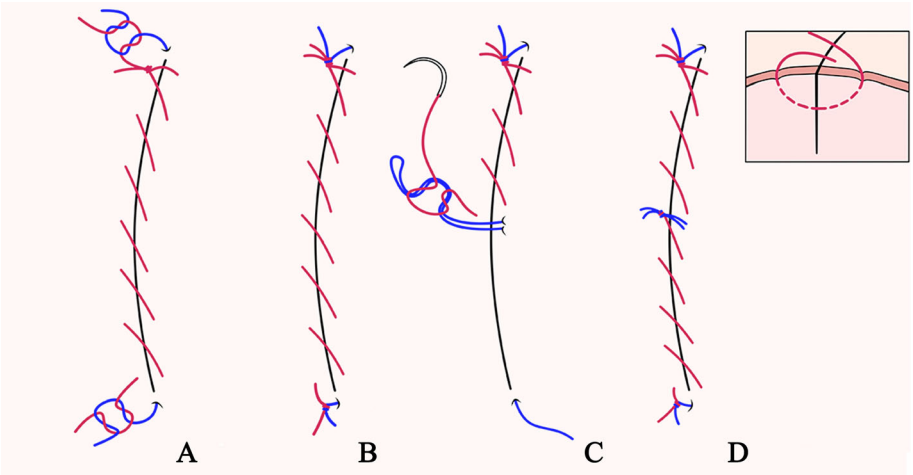

Fig. 3 An illustration of the continuous skin suturing method. Skin sutures were placed using 5-0 absorbable polyglactin thread (Vicryl Rapide, Ethicon, Inc., Somerville, N.J.). The skin suture was knotted with the subcutaneous suture left outside the skin at the end of the incision, and the skin was then continuously sutured. At the end of the suture, the thread was moderately tightened and knotted with the subcutaneous suture at the end of the incision. **A** and **B** For incisions $\leq$ 5 cm, the sutures were knotted at the start and end of the incision; **C** and **D** Incisions $>$ 5 cm were closed with segmental continuous sutures. The subcutaneous suture was passed through the skin in the middle of the incision, leaving a section of the thread outside the skin, which was then knotted with the skin suture during subsequent closure of the skin

(Fig. 4A). For incisions $\leq$ 5 cm in length, the knot at one end of the incision was cut off, and the subcutaneous suture was pulled out from the other end of the incision (Fig. 4B). For incisions $>$ 5 cm in length, the knots at both ends of the incision were cut off, and the subcutaneous suture was pulled out from the middle section of the incision after the skin suture was removed (Fig. 4C).

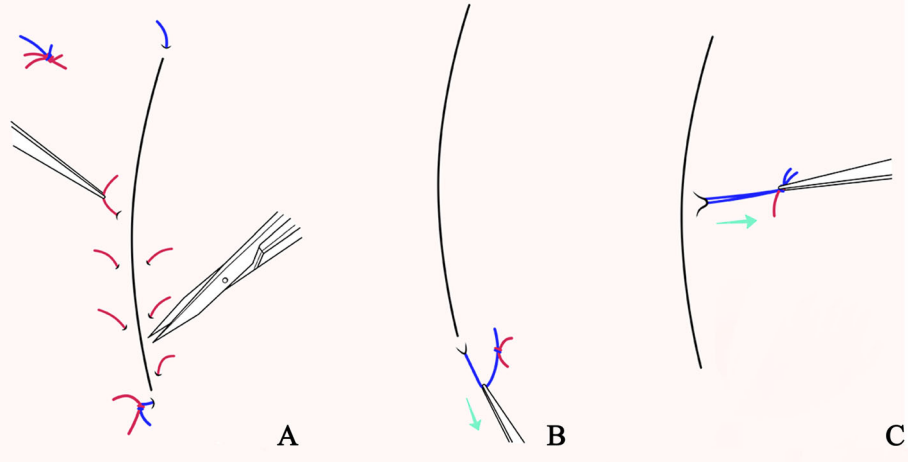

Fig. 4 An illustration of the suture removal process. **A** The skin suture was removed by intermittent cutting of the thread; **B** For incisions ≤ 5 cm, the knot at one end of the incision was cut off, and the subcutaneous suture was pulled out from the other end of the incision; **C** For incisions > 5 cm, the knots at both ends of the incision were cut off, and the subcutaneous suture was pulled out from the middle section of the incision after the skin suture was removed

Results

In total, 68 patients (mean age: 32.8 ± 8.3 years; range, 22–42 years) underwent a total of 127 labiaplasties (bilateral in 59 cases and unilateral in 9 cases). All surgeries were completed successfully and all patients were discharged on the same day. One patient was a smoker, and this patient recovered well without complications after surgery. The mean BMI of the patients was 22.8 ± 0.7 (20.7–24.9). One patient had used steroids 1 year earlier, and this patient recovered well without complications after surgery. The mean operation time was 42.2 ± 12.6 min (range: 30–60 min) for bilateral labiaplasties and 26.7 ± 8.3 min (range: 20–40 min) for unilateral labiaplasties. All 68 patients underwent suture removal seven days postoperatively (Table 1). When considering all 68 patients, the mean FGSIS scores (preoperative and postoperative) were 11.21 ± 1.89 and 25.16 ± 4.08, respectively. The number of preoperative FGSIS separations greater than or equal to 21 points was zero (0%), and postoperatively 62 patients (91.2%) had FGSIS scores ≥ 21 points without any adverse events, and the postoperative patient scores and satisfaction rates were significantly higher (Fig. 5). One to three months postoperatively, the incisions had healed well, and there were no suture-related adverse events. Edge scars were not obvious, and no notches were apparent (Fig. 6A–I). Five patients experienced some bleeding (Mild bleeding in the early postoperative period, oozing blood from the incision, which can be stopped by applying local pressure) at the edge of the incision within 72 h after surgery and recovered, without hematoma formation, after moderate compression treatment in which the patient was seated in a forward-learning position on a thick cushion roll. No wound dehiscence or severe infection was recorded in any of the patients. One patient presented with localized epithelial loss (approx. 3 mm^2, full thickness) of the unilateral labia minora five days postoperatively; this recovered without scarring 20 days postoperatively (Fig. 7A–D).

Table 1 Patient demographics

Demographics	Statistical results
Total number of patients	68
Mean age (± SD), years	32.8 (± 8.3) (Range: 22–42)
BMI (± SD)	22.8 (± 0.7) (Range: 20.7–24.9)
Smoking status	
Smoking	1
Non-smoking	67
Steroid use	
Yes	1
No	67
Total number of labiaplasties	127
Bilateral labiaplasties	59 cases
Unilateral labiaplasties	9 cases
Mean operation time (± SD), minutes	
Bilateral	42.2 (± 12.6) (Range: 30–60)
Unilateral	26.7 (± 8.3) (Range: 20–40)
Suture removal time	7 days postoperatively

Discussion

The new suture method described in this study involved the continuous suturing of both the subcutaneous tissue and skin, followed by the removal of sutures after tissue healing. This approach will minimize irritation and damage to the tissue caused by suture threads. Not all patients exhibit a rejection reaction to absorbable thread; however, marginal suture strangulation, or scar growth, can occur following the first attempt at labiaplasty in some patients, thus suggesting that the tissue of these patients may be

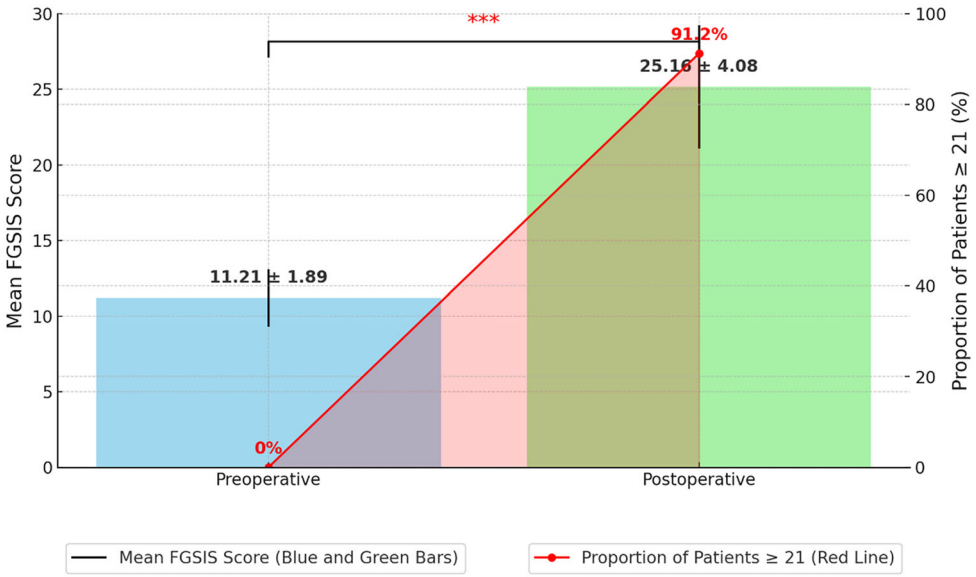

Fig. 5 Comparison of preoperative and postoperative FGSIS scores

excessively fragile and less compatible with absorbable thread. The suture method proposed in the present study is predominantly recommended for patients undergoing reparative plastic surgery of the labia minora to minimize suture-related adverse events. We recommend introducing this new suturing technique to all surgeons who provide labiaplasty. To minimize suture-related adverse reactions, this technique can be preferentially used in the specific group of patients described above, as well as those who have previously experienced adverse events with absorbable sutures in other body parts.

Labiaplasty represents one of the fastest developing cosmetic operations for female genitalia. Due to the morphological diversity and complexity of the labia minora, many surgical approaches for labiaplasty have been developed, including deepithelialization [12, 15, 24], simple edge resection [1, 19, 25], wedge resection [21, 22, 26–29], and combined methods derived from changes in the shape of incision [14, 15, 20]. Although advancements in laser technology have led to the development of laser labiaplasty [30–33], surgery remains the predominant treatment option. While various suturing techniques have been proposed for labiaplasties, there is currently no standardized approach. According to the current literature, incisions in the labia minora should be sutured in two layers, skin sutures and subcutaneous tissue sutures [11], although a few papers have reported three-layer sutures [27, 28]. The suture method also varies according to the experience and habits of the surgeon involved [34].

For the suturing of subcutaneous tissue, most surgeons choose to use absorbable thread for intermittent or continuous sutures. Nonetheless, the existing literature does not describe the removal of sutures from the subcutaneous tissue. Failing to remove these sutures may increase the risk of certain complications caused by the retention of absorbable sutures. Although there is a total lack of published studies relating to the reaction of the labia minora tissue to sutures, some previous animal experiments and clinical studies have shown that the retention of absorbable sutures in the oral mucosa and skin tissue may cause inflammation, aggravate postoperative scarring, and even lead to the formation of suture granulomas [11, 22, 35–38]. Furthermore, different patients may react differently to absorbable sutures [39], and not all patients would be expected to experience adverse effects to sutures. Patients who do not experience adverse effects often feel tenderness at the nodes in the subcutaneous tissue due to the lamellar structure of the labia minora. Based on our observations, the labia minora has a higher probability of reacting to thread knots retained in the subcutaneous tissue than other parts of the body; this might be related to the unique anatomy of the labia minora. The labia minora are a pair of longitudinal skin mucosal folds. The epidermis is composed of compound squamous epithelium, while the subcutis is composed of mainly connective tissue and vascular erectile tissue; there is no adipose tissue. Both sides of the labia minora are flaky structures of the skin; the soft and thin structures of the labia minora, which are devoid of dermis, make it easier for retained knots to break through the epidermis, due to suture rejection, when compared to other parts of the body. Furthermore, the labia minora is a relatively sensitive, nerve-rich, and friction-prone area; consequently, residual suture knots can increase discomfort. To minimize the occurrence of these complications, we performed continuous suturing in the subcutaneous tissue and removed our sutures as soon as the wound was sufficiently strong. We also verified the feasibility of this

Fig. 6 **A–C** Photographs of a 34-year-old woman receiving left-sided labiaplasty: **A** preoperative view, **B** immediate postoperative view, and **C** postoperative view on day 62; **D–F** Photographs of a 36-year-old woman receiving bilateral labiaplasty: **D** preoperative view, **E** immediate postoperative view, and **F** postoperative view on day 58; **G–I** Photographs of a 29-year-old woman receiving left-side labiaplasty: **G** preoperative view, **H** immediate postoperative view, and **I** postoperative view on day 75

method by performing long-term follow-up evaluations. Although the sutures were intended to be removed, we chose absorbable threads because they are softer. Previously, we tried using non-absorbable threads when suturing the subcutaneous tissue; however, because the labia minora are sensitive and prone to friction, and

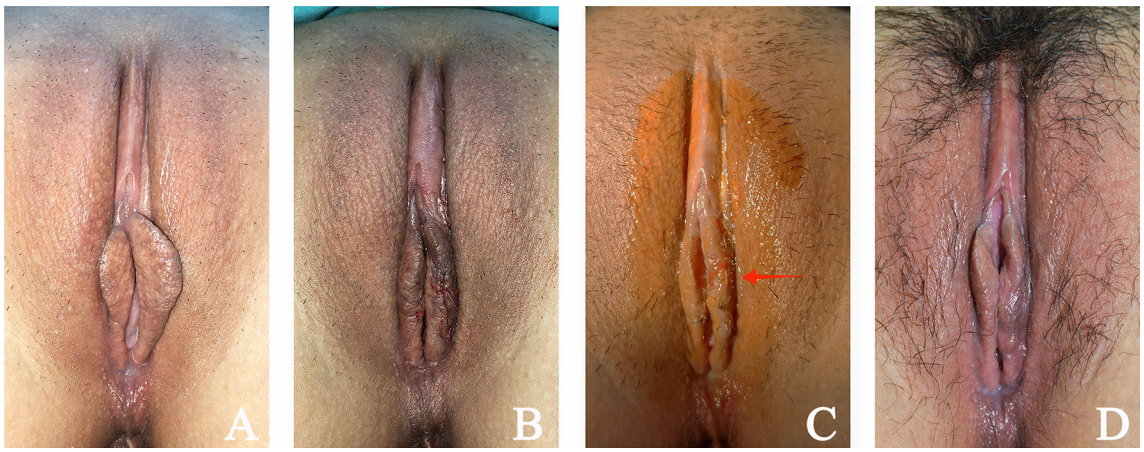

Fig. 7 Photographs of a 31-year-old female receiving bilateral labiaplasty. **A** Preoperative view; **B** Immediate postoperative view; **C** Postoperative view on day 5 showing epithelial loss of the left labia minora; **D** Postoperative view on day 39

because non-absorbable threads are relatively stiff [40], patients complained of discomfort and foreign body sensation prior to removal. We found that absorbable threads provided greater comfort for the patients until the sutures were removed. Therefore, we strongly recommend that the incision in both the subcutaneous tissue and skin should be closed with absorbable threads. In addition, we recommend continuous suturing while placing skin sutures following labiaplasty, especially when applying the edge resection approach. This strategy will disperse tension and the sutures can be removed postoperatively to reduce the cutting effect of the sutures on the tissue over time.

The bulk of the operative time taken to perform labiaplasty includes designing the incision line, removing excess tissue, and then suturing the subcutaneous tissue and skin. Continuous suturing of the subcutaneous tissue and skin can notably reduce the operation time when compared to that of intermittent sutures (56 to 120 minutes for bilateral surgery) [12, 15, 20]. Our approach may improve surgical efficiency, while reducing the duration of wound exposure and bleeding. It should be noted that the proposed suture method is only recommended for implementation in the labia minora; we did not test this method on other areas of the body. The labia minora incurs only minor tension at the incision site. For incisions in other parts of the body, especially those with high tension, there may be a risk of wound dehiscence if applying the suturing method described herein.

There are some limitations to our study which need to be considered. First, frequent follow-up via "App" and video may lead to reporting bias due to the Hawthorne effect, and future studies should incorporate blinding, standardized follow-up, or third-party assessment tools to improve objectivity. Second, this study is a single-arm case series, and future comparative studies with traditional delayed absorbable suture techniques should be conducted to further highlight the advantages and effectiveness of the new technique. Third, the small sample size of this study has limited ability to detect uncommon complications (e.g., wound dehiscence, infections) and may be subject to type II error, and a joint multicenter increase in sample size is needed to further assess safety in the future. Fourth, we neglected to assess sexual function (e.g., FSFI). Fifthly, patients are required to return to the hospital seven days postoperativelty for suture removal, thus increasing the workload of the surgeon and the time required from the patient to attened clinic. Although the vast majority of patients reported insignificant pain when the threads were removed, there were more sensitive patients who complained of pain during suture removal. Sixthly, when returning to the hospital at seven days to remove the stitches, we judged whether the stitches could be removed only by determining whether the patient's incision had healed well, which entailed a certain degree of risk. In the future, more detailed criteria for judging the time to remove the stitches should be developed for different patients' recovery conditions, in order to minimize the risk of wound dehiscence after stitches are removed. Finally, our suture method requires the surgeon to accurately design the incision line and excise a certain amount of tissue to ensure that the length and thickness of the tissues on both sides of the incision are symmetrical when suturing the incision, and that the incision can be naturally dovetailed without excessive tension.

Conclusions

In this study, we describe a new suture method for labiaplasty that is simple to perform and clinically feasible. This method can help to avoid the adverse events associated with sutures and improve surgical efficiency while helping to obtain a better shape of the labia minora edge.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Human Rights All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

References

1. Hodgkinson DJ, Hait G. Aesthetic vaginal labioplasty. Plast Reconstr Surg. 1984;74(3):414–6. https://doi.org/10.1097/00006534-198409000-00015.
2. Turini T, Weck Roxo AC, Serra-Guimaraes F, et al. The impact of labiaplasty on sexuality. Plast Reconstr Surg. 2018;141(1):87–92. https://doi.org/10.1097/PRS.0000000000003921.
3. Goodman MP, Placik OJ, Benson RH 3rd, et al. A large multicenter outcome study of female genital plastic surgery. J Sex Med. 2010;7(4 Pt 1):1565–77. https://doi.org/10.1111/j.1743-6109.2009.01573.x.
4. Liao LM, Creighton SM. Requests for cosmetic genitoplasty: How should healthcare providers respond? BMJ. 2007;334(7603):1090–2. https://doi.org/10.1136/bmj.39206.422269.BE.
5. The Aesthetic Society's Cosmetic Surgery National Data Bank. Statistics 2019. Aesthet Surg J. 2020;40(Suppl 1):1–26. https://doi.org/10.1093/asj/sjaa144.
6. Crouch NS, Deans R, Michala L. Clinical characteristics of well women seeking labial reduction surgery: a prospective study. BJOG An Int J Obstet Gynaecol. 2011;118:1507–10. https://doi.org/10.1111/j.1471-0528.2011.03088.x.
7. Rouzier R, Louis-Sylvestre C, Paniel BJ. Hypertrophy of labia minora: experience with 163 reductions. Am J Obstet Gynecol. 2000;182:35–40. https://doi.org/10.1016/s0002-9378(00)70488-1.
8. Pardo J, Solà V, Ricci P. Laser labioplasty of labia minora. Int J Gynecol Obstet. 2006;93:38–43. https://doi.org/10.1016/j.ijgo.2006.01.002.
9. Munhoz AM, Filassi JR, Ricci MD. Aesthetic labia minora reduction with inferior wedge resection and superior pedicle flap reconstruction. Plast Reconstr Surg. 2006;118:1237–47. https://doi.org/10.1097/01.prs.0000237003.24294.04.
10. Bizjak-Ogrinc U, Senčar S. Sutureless laser labiaplasty of labia minora. Sex Med. 2021;9(5): 100406. https://doi.org/10.1016/j.esxm.2021.100406.
11. Motakef S, Rodriguez-Feliz J, Chung MT, Ingargiola MJ, Wong VW, Patel A. Vaginal labiaplasty: current practices and a simplified classification system for labial protrusion. Plast Reconstr Surg. 2015;135(3):774–88. https://doi.org/10.1097/PRS.0000000000001000.
12. Cao Y, Li F, Li S, et al. A modified method of labia minora reduction: the de-epithelialised reduction of the central and posterior labia minora. J Plastic Reconstr Aesthet Surg. 2012;65(8):1096–102. https://doi.org/10.1016/j.bjps.2012.03.025.
13. Jiang X, Chen S, Qu S, et al. A new modified labiaplasty combined with wedge de-epithelialization on the medial side and edge resection. Aesthet Plast Surg. 2021;45(4):1869–76. https://doi.org/10.1007/s00266-021-02137-2.
14. Gress S. Composite reduction labiaplasty. Aesthet Plast Surg. 2013;37(4):674–83. https://doi.org/10.1007/s00266-013-0149-6.
15. Cao Y, Li Q, Li F, et al. Aesthetic labia minora reduction with combined wedge-edge resection: a modified approach of labiaplasty. Aesthet Plast Surg. 2015;39(1):36–42. https://doi.org/10.1007/s00266-014-0428-x.
16. Choi H, Kim K. A new method for aesthetic reduction of labia minora (the deepithelialized reduction of labioplasty). Plastic Reconstr Surg. 2000;105(1):419–22. https://doi.org/10.1097/00006534-200001000-00067.
17. Felicio YA. Labial surgery. Aesthetic Surg J. 2007;27(3):322–8. https://doi.org/10.1016/j.asj.2007.03.003.
18. Solanki N, Tejero-Trujeque R, Stevens-King A, Malata C. Aesthetic and functional reduction of the labia minora using the Maas and Hage technique. J Plastic Reconstr Aesth Surg. 2010;63(7):1181–5. https://doi.org/10.1016/j.bjps.2009.05.053.
19. Lynch A, Marulaiah M, Samarakkody U. Reduction labioplasty in adolescents. J Pediatr Adolesc Gynecol. 2008;21(3):147–9. https://doi.org/10.1016/j.jpag.2007.03.100.
20. Li F, Li Q, Zhou Y, et al. L-shaped incision in composite reduction labiaplasty. Aesthet Plast Surg. 2020;44(5):1854–8. https://doi.org/10.1007/s00266-020-01867-z.
21. Rouzier R, Louis-Sylvestre C, Paniel B, Haddad B. Hypertrophy of labia minora: experience with 163 reductions. Am J Obstet Gynecol. 2000;182:35–40. https://doi.org/10.1016/s0002-9378(00)70488-1.
22. Alter GJ. Labia minora reconstruction using clitoral hood flaps, wedge excisions, and YV advancement flaps. Plast Reconstr Surg. 2011;127(6):2356–63. https://doi.org/10.1097/PRS.0b013e318213a0fb.
23. Herbenick D, Reece M. Development and validation of the female genital self-image scale. J Sex Med. 2010;7(5):1822–30.
24. Ellsworth W, Rizvi M, Lypka M, et al. Techniques for labia minora reduction: an algorithmic approach. Aesthet Plast Surg. 2010;34(1):105–10. https://doi.org/10.1007/s00266-009-9454-5.
25. Jothilakshmi P, Salvi N, Hayden B, Bose-Haider B. Labial reduction in adolescent population–a case series study. J Pediatr Adolesc Gynecol. 2009;22(1):53–5. https://doi.org/10.1016/j.jpag.2008.03.008.
26. Munhoz A, Filassi J, Ricci M, et al. Aesthetic labia minora reduction with inferior wedge resection and superior pedicle flap reconstruction. Plast Reconstr Surg. 2006;118(5):1237–47. https://doi.org/10.1097/01.prs.0000237003.24294.04.
27. Alter G. Aesthetic labia minora and clitoral hood reduction using extended central wedge resection. Plast Reconstr Surg. 2008;122(6):1780–9. https://doi.org/10.1097/PRS.0b013e31818a9b25.
28. Kelishadi S, Elston J, Rao A, Tutela J, Mizuguchi N. Posterior wedge resection: a more aesthetic labiaplasty. Aesthet Surg J. 2013;33(6):847–53. https://doi.org/10.1177/1090820x13494755.

29. Qiang S, Li F, Zhou Y, et al. A new concept for central wedge resection in labiaplasty. Gynecol Obstet Invest. 2021;86(3):257–63. https://doi.org/10.1159/000513402.
30. Pardo J, Solà V, Ricci P, Guilloff E. Laser labioplasty of labia minora. Int J Gynaecol Obstet Official Organ Int Federation Gynaecol Obstet. 2006;93(1):38–43. https://doi.org/10.1016/j.ijgo.2006.01.002.
31. Smarrito S. Lambda laser nymphoplasty: retrospective study of 231 cases. Plast Reconstr Surg. 2014;133(2):231e–2e. https://doi.org/10.1097/01.prs.0000437239.53671.6f.
32. Gonzalez-Isaza P, Lotti T, Franca K, et al. Carbon dioxide with a new pulse profile and shape: a perfect tool to perform labiaplasty for functional and cosmetic purpose. Open Access Maced J Med Sci. 2018;6(1):25–7. https://doi.org/10.3889/oamjms.2018.043.
33. Bizjak-Ogrinc U, Sencar S. Sutureless laser labiaplasty of labia minora. Sex Med. 2021;9(5): 100406. https://doi.org/10.1016/j.esxm.2021.100406.
34. Motakef S, Rodriguez-Feliz J, Chung MT, Ingargiola MJ, Wong VW, Patel A. Vaginal labiaplasty: current practices and a simplified classification system for labial protrusion. Plast Reconstr Surg. 2015;135(3):774–88.
35. Holzheimer R. Adverse events of sutures: possible interactions of biomaterials? Eur J Med Res. 2005;10(12):521–6.
36. Levin J, Brauer J, Draft K, Junkins-Hopkins J, James W. Suture granuloma following surgical neck rejuvenation procedure. Dermatol Surg Off Publ Am Soc Dermatol Surg. 2006;32(5):768–9. https://doi.org/10.1111/j.1524-4725.2006.32156.x.
37. Setzen G, Williams E. Tissue response to suture materials implanted subcutaneously in a rabbit model. Plast Reconstr Surg. 1997;100(7):1788–95. https://doi.org/10.1097/00006534-199712000-00023.
38. Dragovic M, Pejovic M, Stepic J, et al. Comparison of four different suture materials in respect to oral wound healing, microbial colonization, tissue reaction and clinical features-randomized clinical study. Clin Oral Invest. 2020;24(4):1527–41. https://doi.org/10.1007/s00784-019-03034-4.
39. Andrade M, Weissman R, Reis S. Tissue reaction and surface morphology of absorbable sutures after in vivo exposure. J Mater Sci Mater Med. 2006;17(10):949–61. https://doi.org/10.1007/s10856-006-0185-8.
40. Byrne M, Aly A. The surgical suture. Aesth Surg J. 2019;39:S67–72. https://doi.org/10.1093/asj/sjz036.