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A Case Report of Surgical Correction of Posterior Fourchette Flap Deformities with Z-plasty

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Abstract

Dyspareunia impairs patients' quality of life as well as physical and mental health.In this clinical investigation, single-incision Z-plasty was performed to remodel the anatomical structure of the posterior fourchette with dual-flap design. This surgical approach achieves satisfactory functional and aesthetic outcomes. It substantially lowers the risk of flap necrosis related to conventional multiple-flap procedures while simplifying surgical manipulation and shortening operative duration. No postoperative flap necrosis or recurrent lesion was noted in the patient, and marked improvement in dyspareunia was achieved thereafter. This clinical findings corroborate that Z-plasty constitutes a viable reconstructive strategy for posterior fourchette reconstruction, and this case provides a innovative surgical regimen for clinical application.

Key words:posterior fourchette flap deformities, Z-plasty, sexual function improvement, vulvar aesthetic reconstruction, case report

INTRODUCTION

In recent years, private-sector cosmetic surgery has garnered growing interest among women. Concurrently, the incidence of patients presenting with anatomical deformities of the posterior fourchette has increased significantly. The primary motivations for seeking surgical intervention in this cohort include substantial deterioration in quality of life, as well as clinically relevant impairments in both physical and psychological well-being.

The posterior fourchette is essential to preserve vulvar anatomical wholeness, sexual performance and reproductive capability.[1] Congenital developmental anomalies, trauma, or surgical interventions may result in structural abnormalities of the posterior fourchette.[2] These anatomical deformities are prone to trigger sexual dysfunction, recurrent tissue infections, and other physiological complications.[3] Excessive tissue tension at the posterior fourchette adjacent to the vaginal introitus frequently presents with dyspareunia or repetitive perineal tearing. Progressive cicatrization thereafter exacerbates tissue induration and regional tightness, considerably impairing patients' physical and mental status and their general life quality.[4]

Current literature predominantly focuses on surgical techniques for labiaplasty, clitoral reconstruction, and penile foreskin restoration, by contrast studies targeting corrective repair for deformities of the posterior fourchette remain limited.[5] Consequently, developing a reconstruction technique—capable of restoring anatomical integrity, improving functional outcomes, and offering procedural feasibility—is critically warranted.

CASE REPORT

This report herein presents a 40-year-old female Han Chinese patient who received surgical correction for combined posterior fourchette deformity after persistent dyspareunia prompted her to pursue clinical intervention(Fig. 1). A refined Z-plasty approach was constructed to mitigate regional tethering and improved patient-related dyspareunia complaints(Fig. 2).

Following sterile field preparation with disinfection and surgical draping, the surgeon applied downward traction to the tissue and outlined the planned incision margin before injecting lidocaine–prilocaine mixture for regional infiltration anesthesia. The surgeon incised mucosal and subdermal planes using a No. 11 scalpel to raise a fasciocutaneous flap(Fig. 3), wherein an abundant subcutaneous vascular pedicle was retained to maintain durable flap perfusion.The flap was then repositioned and secured with interrupted sutures under minimal tension. Excess tissue was excised, and layered closure was performed: the submucosal layer was approximated with interrupted 6-0 absorbable sutures, while the superficial mucosal layer was closed with interrupted 5-0 non-absorbable silk sutures.

Postoperatively, the surgical site was covered with a sterile dressing, and localized ice therapy was applied to the vulvar region. Flap viability, judged from tissue hue, capillary refill time and tissue turgor, together with potential hematoma development, underwent serial clinical surveillance. All participants returned for scheduled outpatient review at postoperative day 1. Suture removal was arranged at the seventh postoperative day, with favorable wound healing noted during the procedure(Fig. 4). No obvious scar contracture

was observed within one month after surgery(Fig. 5).The patient reported satisfactory wound healing, improved dyspareunia, and was satisfied with the outcome.



Figure 1. Upon clinical assessment, an irregular posterior fourchette deformity extended along the 5- to 7-o'clock sector and partially overlay the vaginal introitus.



Figure 2. After surgery.

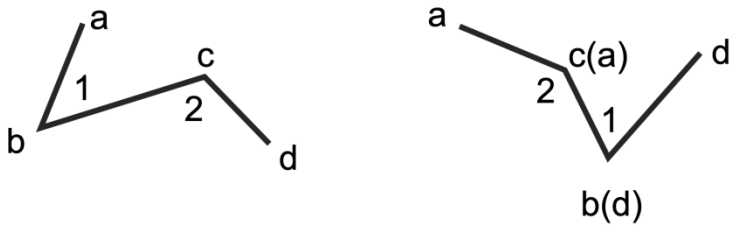


Figure 3. Downward traction was applied to the tissue, where ∠ 1 was an acute angle and ∠ 2 was an obtuse angle.(left). After incision 2 triangular flaps were formed, and the flaps were recombined(right).



Figure 4. A week after surgery,the state after the wires had been disconnected.



Figure 5. One month post-surgery. The incision had healed well.

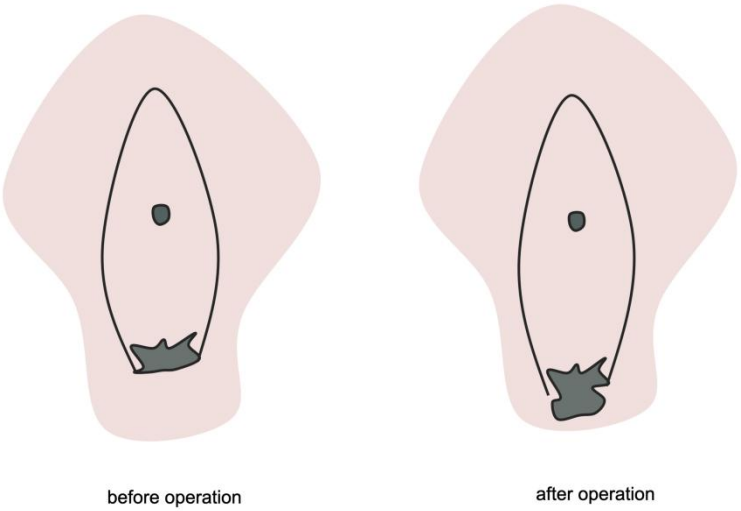


Figure 6. The vaginal orifice was partially obstructed and covered by the posterior fourchette(left). Z-plasty for posterior fourchette deformity achieved marked lengthening of vaginal orifice(right).

CONCLUSION

Congenital developmental defects and repeated inflammatory episodes serve as key predisposing factors for posterior fourchette deformity.[6] Such anatomical abnormality may

also emerge in individuals who have previously undergone wedge resection of the labia minora. It may arise secondary to penile inversion neovaginoplasty during perineal reconstructive surgery for gender-affirming genital transition.[7]

According to clinical research published by Kang YB et al,[8] posterior fourchette deformity falls into three morphological categories: redundant type, relaxed type and constricted type(including type I :web type and II :tight type). Constricted deformity can result in recurrent tissue rupture, sexual discomfort and functional impairment, which provides clear clinical evidencefor corrective reconstructive intervention.While traditional surgical repair can alleviate dyspareunia, postoperative infection, scar formation and other complications, such standard procedures lack individualized customization. Residual wound tension after surgery frequently induces uneven force distribution, secondary scar contracture, and suboptimal functional recovery.[9] For patients with granuloma lesions, redundant soft tissue was excised, followed by primary horizontal incision suturing. Postoperative surveillance revealed an incision dehiscence rate of 27.3%.[10]

For patients classified as type Ⅰ, Kang YB et al. utilized Y-V plasty plus cross suturing to alleviate tissue tension. In type Ⅱ patients, five-flap Z-plasty was performed, by pulling the posterior fourchette and vaginal mucosa inferolaterally and adjusting flap alignment, to protrude edge of the posterior fourchette was lowered. They pointed out that vaginal mucosa presents better elasticity and resectability than vulvar skin, and traction of vulvar skin toward the vaginal lumen should be avoided.[8]

Li Yilin et al.[11] designed a five-flap technique combining Z-plasty with Y-V plasty for the reconstruction of the posterior fourchette. This technique is capable of restoring the

normal anatomical configuration and physiological function of the posterior fourchette. This surgical method shares similarities with the five-flap Z-plasty described by Kang YB et al., the skin tissues were reoriented inward in this technique. However, both studies are limited by short follow-up periods. The absence of long-term follow-up data precludes evaluation of the quality of rearranged tissues, and long-term results regarding functional status and patient satisfaction remain unclear.onathan Frappell et al.[12]proposed a combined technique of double opposing Z-plasty and perineal V-Y advancement, which targets patients with recurrent laceration of the deformed posterior fourchette occurring during coitus. And Wang S et al. reported a case using the five-flap technique to correct constricted deformity with satisfactory clinical outcomes.[13]

For patients with recurrent posterior fourchette scar contracture unresponsive to medication and conventional surgery, autologous adipose-derived regenerative cells were injected into the subcutaneous and submucosal layers around and beneath scar clefts. At the 3-month follow-up, vaginal mucosal fullness, scar softening and improved tissue hydration were clearly observed, suggesting favorable treatment efficacy. This study is limited by the small sample size, which weakens the reliability of clinical evidence.[14]

This article reviews the mainstream clinical classification systems and surgical approaches for posterior fourchette deformity, including Y-V plasty and five-flap Z-plasty. Our center adopts the traditional single Z-plasty technique. Featuring dual-flap incisions, this technique reshapes fused tissue anatomy(Fig. 6), effectively lowering the flap necrosis risk inherent in multi-flap procedures, simplifying surgical steps and shortening operative time.This outcome confirms that standalone Z-plasty reconstruction is a feasible and

reliable treatment for posterior fourchette deformity. Meticulous preoperative incision design and precise adjustment of flap orientation are essential to align the posterior fourchette's nadir close to the perineal midline, which facilitates favorable symmetrical restoration after complete tissue healing.

Ethics Statement

This study was approved by the institutional review board of Yiwu Maternity and Children Hospital (Grant No. Y2026-27).

Consent to publish

Written informed consent for the publication of this case report and accompanying images was obtained from the patient. A copy of the signed consent form will be made available for review by the Editor-in-Chief of this journal on request.

Availability of data and materials

The data used in this article are available upon request from the authors.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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Author Contributions

Qianqian Guo : Conceptualization, Writing—original draft, Writing—review & editing, Approval of final manuscript.

Chaoqun Zhu : Data curation, Writing—review & editing, Approval of final manuscript.

Jiadong Liu: Formal analysis, Supervision, Writing—review & editing, Approval of final manuscript.

Jizhen Xia : Project administration, Visualization, Writing—review & editing, Approval of final manuscript.

Mengni Cong : Software, Validation.

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Disclaimer

The viewpoints expressed in this work belong solely to the authors, and shall not be regarded as the official opinions of the institution or funding organizations.

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