

Labioplasty for Hypertrophic Labia Minora Contributing to Recurrent Urinary Tract Infections

Jonathan A. Wu, MD,* Emmanuel J. Braschi, MD,† Patricio L. Gulminelli, MD,‡
and Craig V. Comiter, MD*

Introduction: Reduction labioplasty for hypertrophic labia minora is often performed for aesthetic reasons by cosmetic vaginal surgeons. However, hypertrophy of the labia minora can also result in significant morbidity because it causes physical discomfort during activity and interferes with the ability to maintain local hygiene and perform intermittent self-catheterization in certain patients.

Objectives: We describe a case in which a commonly used technique for reduction labioplasty was performed on a patient who had difficulty performing intermittent catheterization and report on the aesthetic and functional outcomes.

Methods: A linear resection labioplasty was performed in a 13-year-old girl who was having increasing difficulty performing intermittent self-catheterization because of redundant labial tissue. She was also developing frequent recurrent urinary tract infections thought to be secondary to difficulty maintaining local hygiene and reduced compliance with her intermittent catheterization regimen.

Results: An excellent cosmetic and functional result was achieved with the procedure. Comparison of preoperative and postoperative photographs demonstrates the extent of the reduction labioplasty. The patient has not had any more difficulty with catheterization or recurrent urinary tract infections in 30 months of follow-up.

Conclusions: Reduction labioplasty is indicated for hypertrophic labia minora for more than aesthetic reasons. We describe a case in which the procedure allowed the patient to more easily perform intermittent catheterization and helped eliminate her recurrent urinary tract infections.

Key Words: female genitalia, intermittent urethral catheterization, spinal dysraphism, urinary tract infections

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Hypertrophic labia minora is a seldom publicized problem that can cause physical irritation and discomfort as well as anxiety due to aesthetic reasons. In certain patients, this condition interferes with the ability to perform intermittent self-catheterization and maintain local hygiene. These factors may further predispose the patient to developing recurrent urinary tract infections. Although there is a paucity of scientific literature supporting this claim, it is quite plausible that allowing one to more easily retract the labia minora could potentially lead to fewer bacteria being tracked into the bladder during intermittent catheterization. Furthermore, if difficulty self-catheterizing reduces patient compliance with their

bladder management strategy, one can imagine that there is increased contact time of the oftentimes colonized urine with the bladder mucosa, which may increase the risk of developing symptomatic urinary tract infections. In addition, overfilling of the bladder because of diminished compliance with intermittent catheterization can potentially increase this risk as well.¹ Overdistension of the bladder may lead to breakdown in the normal mucosal barrier function of the urothelium that could allow uropathogenic bacteria to proliferate. It is for this reason that urologists will counsel children with a history of recurrent urinary tract infections extensively to modify any dysfunctional voiding habits. Similarly, development of urinary tract infections in the setting of obstructive uropathy from benign prostatic hypertrophy is an indication for transurethral resection of the prostate.

OBJECTIVES

We describe a case in which a commonly used technique for reduction labioplasty was performed on a patient who had difficulty performing intermittent catheterization and report on the aesthetic and functional outcomes.

METHODS

We evaluated a 13-year-old girl with a history of myelomeningocele who was having more frequent urinary tract infections in association with greater difficulty performing intermittent catheterization. She also had a history of moderate developmental delay so her mother assisted her with her catheterizations every 3 to 4 hours during the day. As her primary caretaker, her mother mentioned that it was increasingly difficult to separate her daughter's labia and introduce a catheter because her labial tissue had become much more redundant over the past several years. This difficulty led to reduced compliance with the intermittent catheterization regimen. Moreover, the patient was developing symptomatic urinary tract infections every 2 to 3 months despite trials of antibiotic prophylaxis. Examination of her genitalia revealed hypertrophic labia minora bilaterally (Fig. 1A), and we performed a reduction labioplasty (Fig. 1B) after informed consent was obtained in accordance with the principles of the Helsinki Declaration.

Redundant tissue was excised in a longitudinal manner using a cold knife. There was some mild hemorrhage in the deeper subcutaneous space so the space was obliterated with 3-0 catgut suture in a running locking horizontal mattress fashion. The vaginal epithelium was then reapproximated with 3-0 catgut suture in a simple interrupted fashion. Surgery went well, and she was discharged home the same day with an indwelling Foley catheter for 2 weeks. We recommended bed rest at home for the first 2 days and local application of ice to help reduce any local swelling and pain. The decision to use catgut suture was based on the patient's concern that she would have suture material in situ so we hoped to use a material that would dissolve quickly. The recommendation for bed rest was an additional safeguard taken to ensure adequate wound healing while minimizing the risk of possible dehiscence and soft tissue edema because the patient was quite physically

From the *Department of Urology, Stanford University School of Medicine, Stanford, CA; and †Division of Urology and ‡Division of Plastic and Reconstructive Surgery, National Institute for Rehabilitation, Provincia de Buenos Aires, Argentina.

Reprints: Jonathan A. Wu, MD, Department of Urology, Stanford University School of Medicine, 300 Pasteur Dr, RM S287, Stanford, CA 94305-5118. E-mail: Jonathan.ai.wu@gmail.com.

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Jonathan A. Wu and Emmanuel J. Braschi contributed equally to this work.

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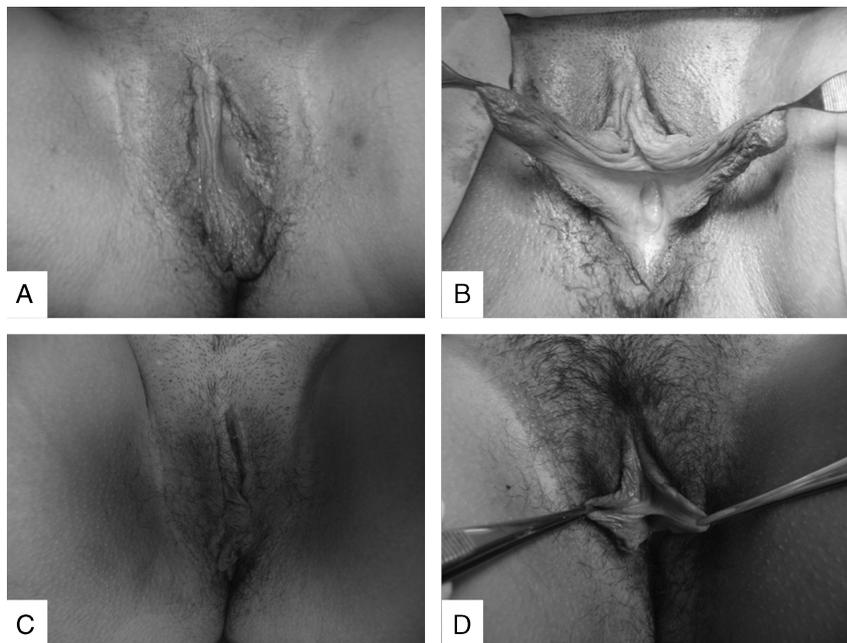


FIGURE 1. A, Preoperative appearance of the labia minora. B, Intraoperative appearance of the labia minora. C, Postoperative appearance of the labia minora at 1 month follow-up. D, Postoperative appearance of the labia minora on gentle stretch.

active at baseline, and with her developmental delay, we were concerned that she would not be as compliant with a more lenient activity restriction.

RESULTS

The patient and her mother were quite happy with the cosmetic and functional outcome (Fig. 1C and D). After this procedure, the mother has been able to perform intermittent self-catheterization without difficulty and has not had any recurrent urinary tract infections in 30 months of follow-up despite stopping her antibiotic prophylaxis regimen 6 months prior.

DISCUSSION

Labia minora hypertrophy can cause dyspareunia, discomfort with clothing or exercise, and difficulty maintaining perineal hygiene or performing intermittent catheterization. Labia minora hypertrophy is defined as having a distance of greater than 4 cm between the inner and outer border when the labia is put on gentle stretch.² This can be considered an anatomical variant and is not necessarily a pathologic entity because the etiology can be congenital, the result of androgenic hormones, manual stretching, or chronic irritation.

In general, the primary indication to intervene for this problem is aesthetic and/or functional.²⁻⁵ Most patients cite discomfort during exercise or sexual activity, problems with hygiene, or local irritation from clothing or while walking. A retrospective study of 163 patients over a 9-year period demonstrated that the motivation for surgery included aesthetic concerns in 87% of cases, discomfort in clothing and during exercise in 26%, and entry dyspareunia in 43% of cases with some overlap between the groups.²

Our patient had difficulty performing intermittent catheterization secondary to her redundant tissue. It was felt that her labia minora hypertrophy was predisposing her to recurrent urinary tract infections because it was interfering with proper cleansing and exposure of the urethral meatus. She represents a specific patient population in which labioplasty for hypertrophic labia

minora has not been well studied. Kato et al⁶ previously published a case report involving 3 female patients with spina bifida who underwent labioplasty for difficulty performing intermittent catheterization and maintaining perineal hygiene with good aesthetic and functional results.

Reduction labioplasty is becoming a more commonly requested surgical procedure that has been described mostly in the plastic surgery and gynecology literature. In one of the largest reported cases series to date that included 163 patients, Rouzier et al² reported that 91% of patients were satisfied with the aesthetic result of the reduction, whereas 96% stated that the surgery corrected the discomfort associated with intercourse, clothing, or exercise.

Various techniques have been described for labioplasty, and the traditional linear resection technique remains the most widely used because of its simplicity.^{7,8} However, this method can produce a scar along the edge of the new labia, which can be quite fragile and stiff, causing recurrent irritation and discomfort.

Choi and Kim⁹ support a technique that involves de-epithelializing a vertical oval area on the central and lateral labial minora and then reapproximating the edges with an absorbable suture. This method can sometimes be complicated by excess labial width and thickness due to retained central parenchyma. The technique can be quite difficult in inexperienced hands because this method requires careful de-epithelialization of already very thin labial tissue.

A third method involves excising an inferior wedge of labial tissue and reapproximating the superior pedicle flap to the posterior vaginal fourchette.¹⁰ This technique can be complicated by wound dehiscence, narrowing of the introitus, and creation of a sharp color change at the suture line. Rouzier et al² used this technique for 163 patients and reported that 11 patients (7%) underwent a second procedure because of dehiscence that resulted in poor cosmesis.

Maas et al¹¹ advocate performing complementary W-shaped excisions on the medial and lateral aspects of the labia minora with interdigitating W-plasty closure.^{11,12} This technique results in a theoretically tensionless zigzag suture line running obliquely across

the edge of the labium and prevents wound contraction in both the longitudinal and transverse directions. Proponents of this method state that this benefit acts to reduce the risk of wound dehiscence and advancement of the posterior fourchette, which can lead to tightening of the introitus. Sexual function and sensation are generally left intact because the anterior and posterior commissures are left untouched and the tissue around the base of the labia minora, where branches of the superficial perineal nerve infiltrate, is not disturbed.

Ellsworth et al¹³ have recently proposed an algorithm to guide which patients would benefit from a particular labioplasty technique. Patients with the least amount of labial hypertrophy (<4 cm) are most effectively treated with the de-epithelialization technique because this preserves the natural texture, color, and neurovascular supply and avoids a prominent suture line on the new labial edge. In patients with larger labia (>4 cm), either the longitudinal excision or the inferior wedge resection technique is recommended. The edge excision technique creates a different aesthetic result because it amputates the naturally darker corrugated edge compared with the inferior wedge excision technique. Patient preference should be taken into account when deciding between these 2 procedures because some patients associate the darker edge with an aged appearance. Furthermore, the surgeon should understand that the fragile nature of the vascular pattern of the superior pedicle predisposes it to tip necrosis, which can lead to postoperative scar formation and distortion. In this regard, smokers and diabetic patients should be considered at higher risk for wound-healing complications with this technique in particular. Using this algorithm, this group demonstrated a robust 92% overall patient satisfaction rate.

Indeed, patient expectations should be carefully considered preoperatively to help guide the type of surgical procedure performed and the extent of resection. Miklos et al¹⁴ described postoperative cosmetic expectations in a retrospective study of 550 women. They found that half of the patients surveyed desired the edge of the labia minora to be below the edge of the labia majora whereas approximately a third preferred the edges to be approximately even with each other. Interestingly, most (97%) of their patients desired pink labia postoperatively versus darker edges, but this may have also been a reflection of the predominantly white patient population (85%).

Although there is no current prospective data regarding which technique is superior, the algorithm proposed by Ellsworth et al may prove helpful in choosing a surgical labioplasty method. We feel that the approach is based on sound plastic surgery principles and can be applied to most urology patients who have difficulty performing self-catheterization because of hypertrophy of the labia minora.

CONCLUSIONS

Reduction labioplasty is often performed for hypertrophic labia minora for aesthetic reasons. Nonetheless, this procedure is also indicated when hypertrophic labia minora cause significant physical discomfort with activity or interfere with one's ability to perform intermittent self-catheterization. We describe a case in which the procedure helped eliminate a patient's

recurrent urinary tract infections by facilitating her ability to perform intermittent catheterization. There is currently a paucity of published literature describing reduction labioplasty performed for functional reasons. Nonetheless, it is quite possible that the procedure allowed our patient to retract her labia more easily, thus allowing her to introduce fewer bacteria into her bladder during catheterization and improved her compliance with this bladder-emptying regimen. Improved compliance may prevent urinary tract infections by reducing the contact time between the oftentimes colonized urine with the bladder mucosa and avoiding recurrent overdistension of her bladder, which could potentially lead to breakdown in the normal mucosal barrier function of her urothelium against uropathogens.

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