

Female Urethroplasty Using a Labia Minora Flap: A Case Report

Labia Minör Flebi Kullanılarak Kadın Üretroplastisi: Olgu Sunumu

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ABSTRACT Female urethral stricture (FUS) is a rare condition contributing to bladder outlet obstruction in women with lower urinary tract symptoms. This case report details a 54-year-old female patient presenting with voiding difficulties following multiple traumatic catheterizations. Diagnostic tests revealed a maximum urine flow rate of 6.9 ml/sec and a significant post void residual volume of 280 ml. Under general anesthesia, urethroplasty was performed using a labia minora pedicle flap. The procedure involved dissecting the periurethral tissues, preparing an appropriate-sized flap from the right labia minora, and suturing it to close the incised distal urethral stricture over a 20 Fr catheter. Postoperative recovery was successful, with uroflowmetry showing a maximum urine flow rate of 35.7 ml/sec and no residual urine 1 month after surgery. At the 1-year follow-up, the patient reported no further voiding issues, demonstrating the efficacy of the labia minora flap technique for FUS repair.

Keywords: Urethra; urethral stricture; surgical flaps

ÖZET Kadın üretra darlığı [female urethral stricture (FUS)], alt üriner sistem semptomları olan kadınlarda mesane çıkış tıkanıklığının seyrek görülen sebeplerinden biridir. Bu olgu sunumunda, çoklu travmatik kateterizasyon sonrası idrar yapma güçlüğü şikâyetiyle başvuran 54 yaşındaki bir kadın hasta ele alınmıştır. Tanı testleri, maksimum idrar akış hızının 6,9 ml/sn ve işeme sonrası artık idrarın 280 ml olduğunu göstermiştir. Hastaya genel anestezi altında, labia minora flebi kullanılarak üretroplasti yapılmıştır. Prosedür, periüretral dokuların diseksiyonu, sağ labia minoradan uygun boyutta bir flebin hazırlanması ve darlığın 20 Fr kateter üzerinden insize edilen distal üretra kısmını kapatmak için sütüre edilmesini içermektedir. Ameliyat sonrası iyileşme başarılı geçmiş, bir ay sonraki üroflowmetrik incelemede maksimum akım hızı 35,7 ml/sn ve işeme sonrası artık idrar olmadığı gösterilmiştir. Bir yıllık takipte hasta, idrar yapma problemi olmadığını belirtmiştir. Labia minora flebi tekniği FUS onarımında etkili bir yöntem olarak gösterilmiştir.

Anahtar Kelimeler: Üretra; üretra darlığı; cerrahi flepler

Female urethral stricture (FUS) is a rare disease. In a review paper, Hoag and Chee reported that bladder outlet obstruction was between 2.7-8% of women with lower urinary tract symptoms and FUS was responsible for between 4-18% of these cases.¹ Even if some cases are idiopathic, different etiologies including trauma, iatrogenic injury, infection, malignancy, and radiation may be found in some patients with FUS.^{2,3} Although no widely accepted definition for FUS is currently available, an anatomical narrowing between the bladder neck and distal urethra

less than 14 Fr is considered FUS. This means insufficient urethral caliber for catheterization.^{4,5} There are some concerns among surgeons that female urethroplasty is a rare disease, lack of experience, and some potential risk of complications (e.g., urinary incontinence).⁵

In this case report, we present a female patient who had difficult voiding related to distal urethral stricture after traumatic urethral multiple catheterizations in whom we performed urethroplasty using a labia minora flap.

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CASE REPORT

A 54-year-old female patient applied to our clinic with complaints of difficulty in urination and straining to urinate. She had a history of multiple traumatic urethral catheterisations. Maximum urine flow rate was 6.9 ml/sec and post voiding residual urine was 280 ml (Figure 1). The diagnosis of urethral stricture was made with these results combined with clinical complaints. Under general anesthesia, the patient was positioned in the lithotomy posture. The labia minora were held back using sutures or a Lone Star retractor to achieve optimal visualization of the vestibule, urethral meatus, and vaginal introitus. Urethral catheter was not placed due to the narrowing of urethral lumen. The urethra was carefully entered with a semi-rigid ureterorenoscope (URS) (7.5 Fr). Proximal urethral lumen, bladder neck and bladder were observed. Proximal part of the urethra and bladder neck were normal. There was trabeculations in the bladder. A guidewire (0.035 inch) was placed through sem-rigid URS into the bladder. Normal saline was injected in periurethral tissues to dissect easily anterior vaginal wall from urethra. After placing 2 stay sutures at 3 and 9 o'clock positions, a vaginal flap was obtained by making an "inverted U-shaped" vaginal incision on the anterior vaginal wall. The upper border of the flap was just below the urethra. Then urethral lumen was opened ventrally up to seeing healthy urethral mucosa.

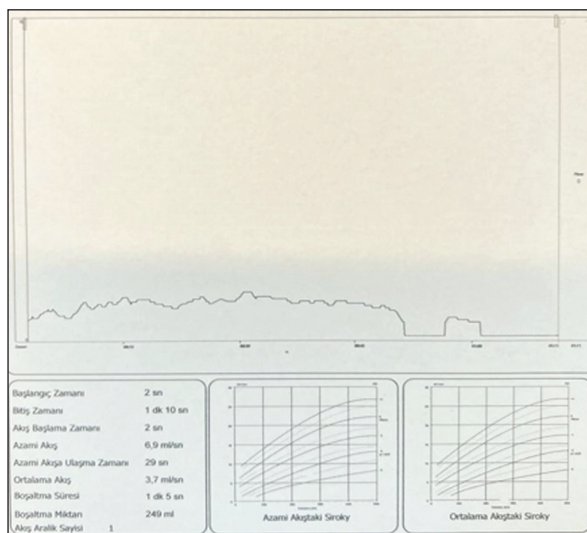


FIGURE 1: Preoperative uroflowmetry.

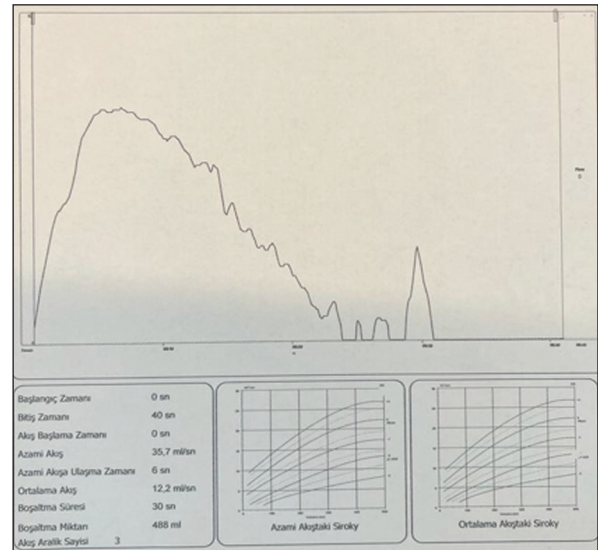


FIGURE 2: Postoperative uroflowmetry.

Length of narrow part of the urethra was 2 cm. Flap urethroplasty was planned using labia minora pedicle flap. After placing 20 Fr urethral Foley catheter, labia minora pedicle flap on right side was prepared in appropriate size to close distal urethral part. After obtaining a flap pedicle of sufficient length to avoid flap tension after suture, the distal urethra was closed with this flap using a 5/0 polyglactin suture over 20 Fr urethral Foley catheter. After hemostasis control, urethra and flap were covered using anterior vaginal wall flap. Labia minora area taken flap from right side was primarily sutured using 4/0 Vicryl. For hemostasis, a vaginal tampon impregnated with povidone iodine was inserted. Vaginal tampon was removed after 24 hours. Urethral catheter was removed in 3th weeks. Postoperative uroflowmetry in 1st month was found that Qmax was 35.7 ml/sec and there was no residual urine after voiding (Figure 2). In 1st year control, there is no voiding problem in the patient. Informed consent form was obtained from the patient.

DISCUSSION

Although urethral stricture is an important problem that can seriously affect the quality of life in both men and women, it is one of the problems that urologists do not want to deal with. The reason for this is that the treatments applied are not as successful as expected and the stenosis often recurs. The reasons for

this are that the treatments applied are not as successful as expected and the stenosis recurs, as well as the anatomy of this region is not well known by urologists.

Urethral dilatation is often regarded as the initial treatment option for managing urethral stricture in women, although its long-term success rate remains quite low.⁶ Consequently, urethroplasty involving the use of flaps or grafts is frequently necessary in such cases. Common techniques include vaginal or labial flaps, as well as buccal or lingual mucosal grafts. Among these, urethroplasty utilizing vaginal or labial flaps is the most commonly performed procedure. Local flaps offer several benefits, including good vascularity, flexibility, and minimal donor site morbidity.^{1,3} However, in patients with vaginal atrophy or fibrosis, local flaps may not be suitable. For these individuals, oral mucosal grafts present a viable alternative, as they are elastic, hairless, readily available, and sufficiently large. Moreover, harvesting oral mucosal grafts is relatively simple and causes minimal damage to the donor site. As a result, oral mucosal grafts are widely regarded as an excellent option for urinary tract reconstruction.⁷

We used labia minora pedicle flap to repair distal urethral stricture in our case. In 1st year control, the patient had no voiding problem. Urethral reconstruction with labia minora pedicle flap, which is tunneled beneath the vaginal epithelial layer was described by Tanello et al. in 2002.⁸ Success rate of vaginal flap urethroplasty procedure was found between 80-100% in later studies.⁹⁻¹² In comparative studies by Kore et al. with 33 women and Kudunthail et al. with 32 women, dorsal only buccal mucosal ure-

throplasty and vaginal wall urethroplasty showed no significant differences in urethral patency outcomes.^{13,14}

There is no clear consensus on the optimal approach or choice of graft or flap material for female urethral reconstruction. Factors such as anatomical characteristics (location and length of the stricture, presence of vaginal atrophy or fibrosis), history of radiotherapy, associated skin diseases, and surgical experience play an important role in the decision-making process. In conclusion, the labia minora flap appears to be a suitable option for reconstructing female urethral strictures.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Ali Atan; **Design:** Fazlı Polat; **Control/Supervision:** Ali Ünsal; **Data Collection and/or Processing:** Mustafa Kaba; **Analysis and/or Interpretation:** Murat Yavuz Koparal; **Literature Review:** Murat Yavuz Koparal, Mustafa Kaba; **Writing the Article:** Ali Atan, Murat Yavuz Koparal; **Critical Review:** Ali Ünsal, Fazlı Polat; **References and Fundings:** Mustafa Kaba; **Materials:** Mustafa Kaba.

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