A novel case of female urethral stricture and repair

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1. Introduction

Compared to urethral strictures in men, female urethral strictures are poorly studied and represent a small fraction of the available literature. This leads to unique challenges in diagnosis, evaluation, and treatment. Presenting symptoms include both irritative and obstructive lower urinary tract symptoms (LUTS) alongside frequent urinary tract infections. Though female urethral strictures are easily visualized by cystoscopy and are evident on voiding cystourethrogram (VCUG), patients may experience a delay in diagnosis while more common sources of LUTS such as urinary tract infection (UTI), interstitial cystitis, pelvic organ prolapse, or stone disease are evaluated. Nearly half of documented strictures are not attributed to a particular etiology, though the leading causes include idiopathic, iatrogenic, trauma related, and childbirth.

2. Case presentation

A 35-year-old gravida-2 para-2 woman presented with a nine-year history of bothersome urinary symptoms, including frequency, urgency, dysuria, weak stream, nocturia to 2–3 times per night, and hesitancy. She noted that her symptoms began shortly after the delivery of her first child via normal spontaneous vaginal delivery without complications. Before being referred to our clinic, she had been diagnosed with interstitial cystitis/bladder pain syndrome refractory to medical treatment or lifestyle changes. When evaluated by cystoscopy, she was found to have a 6Fr distal urethral stricture, which was validated on urethroscopy and VCUG at our clinic. Her proximal urethra appeared dilated during voiding with 3cm of urethral length visible prior to the distal narrowing.

The patient was counselled on the risks and benefits of therapies including dilation, excision or extended meatotomy, ventral stricturoplasty, or dorsal urethroplasty with flap or graft and elected to proceed with urethroscopy under anesthesia and ventral stricturoplasty with option for suprameatal augmented urethroplasty.

On the day of surgery, the patient was prepped and draped in lithotomy position. An 8.5 Fr infant cystoscope was used for visualization. Exposure was obtained with a weighted speculum and self-retaining retractor, and a 6Fr Foley catheter was placed. An inverted U incision was made in the anterior vaginal wall with the apex near the meatus and the arms extending to the level of the bladder neck, and a flap of vaginal skin was mobilized. A second tissue layer of periurethral fascia was likewise elevated off the urethra by making a transverse incision and then raising flaps proximally and distally. The cystoscope was reinserted, the area of the stricture was identified endoscopically, and the corresponding area of the urethra was externally marked over the cystoscope light. A longitudinal incision was then made through the urethra through the area of the stricture, and the urethra was successfully calibrated to 20Fr. A longitudinal incision in the urethra was closed horizontally and the periurethral fascia flaps were closed over the urethra in a watertight Hineke-Mickulitz (H-M) fashion. The vaginal wall flap was closed, and an occlusive vaginal dressing was placed. The patient tolerated the procedure well and was discharged the following day with a 16Fr Foley catheter.

The patient returned to clinic two weeks postoperatively for VCUG, which revealed a widely patent urethra. She was able to spontaneously void without symptoms after removal of the Foley.
reevaluated at three months post-op with cystoscopy which revealed a urethra without strictures and was otherwise unremarkable. She did note at this time reemergence of some of her presenting symptoms, particularly urinary frequency, which is not surprising considering the degree of bladder remodeling that would take place after relieving her obstruction.

3. Discussion

The treatments available for female urethral strictures are diverse, ranging from minimally to highly invasive. Historically, urethral dilation was utilized to expand the urethra surrounding a stricture allowing for better urine flow, but frequently are repeated as the stricture recurs or is complicated by further fibrosis. Urethroplasty has been shown to be both more effective and definitive in male patients and is now increasingly more common as the first treatment utilized in that demographic but may be complicated by graft or flap failure in both men and women.

Stricturoplasty offers a simplified means of correcting urethral patency. Some studies have found it to be less efficacious than urethroplasty in male patients, necessitating further surgical correction over time, however this is not established in female patients. In appropriately selected patients, we believe that stricturoplasty may be a less invasive approach. This technique is likely ideal for strictures <1 cm in size, however there is little evidence-based data to further qualify the ideal candidate.

Stricturoplasty would likely be less effective if there was a significant amount of fibrosis or scarring in the plane of the initial dissection of the superficial flap or periurethral tissue, if there was a history of significant clinical concern for poor wound healing, such as a history of radiation or chronic inflammation, or if the length of the stricture was not identified or larger than expected. In the event that complications were identified after the ventral incision was made, it may be reasonable to attempt a ventral graft rather than a H-M closure. The small incidence of this disease makes clear patient selection criteria difficult to define, and more research is needed.

In interesting contributing factor to this patient was that she was initially evaluated overseas and was referred to our facility through the military healthcare system. Ideally, patients should have stricture patency evaluated at longer follow-up intervals than three months. However, she was only able to stay locally for a limited period before returning to a limited resource setting. Though this patient was only calibrated to 20Fr, 28Fr may be more ideal and have greater symptomatic relief.

4. Conclusion

Female urethral strictures are a rare cause of LUTS, but one that is important to identify and treat early on to avoid long term pain and discomfort for patients. Even if a logical source of a stricture is not clinically identified, female urethral stricture is a reasonable diagnosis to be considered. Stricturoplasty is an effective treatment option to consider for female urethral strictures that avoids repeated dilation attempts or more invasive substitution urethroplasty, representing what may be an underutilized approach to female urethral stricture.

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