

CASE REPORT

The role of Mitrofanoff appendicovesicostomy in the management of a pelvic fracture urethral distraction defect in a 24-year-old man after multiple failed reconstruction attempts

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Abstract

Failed pelvic fracture urethral distraction defect (PFUDD) repairs present a considerable challenge for management. Redo urethroplasties for failed repairs are associated with higher recurrence and morbidity rates. The case presented describes a male patient with a PFUDD who had undergone multiple failed repairs. Mitrofanoff appendicovesicostomy was successfully carried out, and the patient remains continent to date. Mitrofanoff appendicovesicostomy is not commonly employed in the management of adult urethral stricture disease. We present our experience with managing a PFUDD after multiple failed urethroplasties using a continent catheterizable urinary diversion technique.

Keywords: pelvic fracture urethral distraction defect, Mitrofanoff urinary diversion, failed PFUDD repair, complex PFUDD repair, Zambia

Introduction

Urethral strictures are some of the most common conditions treated by urologists in low- and middle-income countries (LMICs).[1],[2] Evidence suggests that the most common types of strictures treated by urologists in these parts of the world are posttraumatic and infectious strictures.[1],[2] Consequently, there is a large burden of urethral reconstructive surgery in centres that may not always have the necessary resources and expertise.[2] Patients are, therefore, subjected to long-term indwelling suprapubic catheters, which despite being considered a safe and simple treatment for acute or chronic urinary retention, have complications associated with prolonged use, such as infection, catheter retention, and increased risk of malignancy.[3] Pelvic fracture urethral distraction defects (PFUDDs), which make up a significant proportion of posttraumatic urethral strictures in LMICs,[1] present a significant management challenge to urologists, especially after several failed attempts at repair.[3],[4] As a management option, continent urinary diversion is not considered the standard of care in the treatment of urethral stricture disease.[2],[4],[5] Despite this, there have been some documented cases of continent urinary diversion as a treatment modality for complex urethral

strictures that have proven difficult to treat via conventional urethroplasty methods.[3],[6] Various methods of continent urinary diversion exist and have been modified and combined to improve urinary continence and reduce the rate of diversion-related complications.[3]

We present our experience with the management of a patient with a PFUDD after multiple failed attempts at repair in a low-resource setting. We describe the patient's clinical course and outline our experience with Mitrofanoff appendicovesicostomy after failed PFUDD repairs.

Case presentation

A 24-year-old man was being followed up at our institution for urethral stricture disease. He had undergone 3 urethroplasties over the previous 3 years and was living with an indwelling suprapubic catheter. The young man was significantly impeded by living with the indwelling catheter and complained of an inability to find and sustain meaningful economic activity due to the frequent hospital visits, recurrent admissions, and prolonged follow-up.

The patient's medical records revealed that he had experienced polytrauma and had been treated for an open pelvic fracture with hip dislocation in 2015. The initial management



Figure 1. Preoperative combined cystourethrogram

of the pelvic fracture-related urethral injury included suprapubic cystostomy and catheter placement. He presented 5 months after the injury occurred and still had a continuously draining catheter in situ. Baseline investigations included a full blood count and kidney function tests, which returned normal results. A combined cystourethrogram was carried out and revealed a pelvic fracture urethral distraction defect (PFUDD). The first repair was an excision and primary anastomosis. However, the patient was readmitted 2 months later, unable to void through the urethra. His medical records were unclear as to whether the suprapubic tube was still in situ at this point. A second anastomotic urethroplasty, via a perineal approach, was carried out in 2016 with an unsuccessful trial without catheter thereafter, and the patient continued to use the suprapubic catheter. Outpatient follow-up continued with the indwelling suprapubic tube in situ, as the patient was unable to void per urethra. The third redo anastomotic urethroplasty, also via a perineal approach, was carried out in 2017—2 years after the initial injury; however, the timing of the subsequent trial without catheter was unclear from the records.

According to the patient's medical records, he presented to the urology unit again in 2018 with a complete inability to void per urethra. According to the patient, he had been using the suprapubic tube since his last discharge, as he had been having voiding difficulties since then. A combined cystourethrogram revealed a long posterior stricture with a blind-ending bladder proximal to the bladder neck (Figure 1); this was confirmed via flexible antegrade cystoscopy wherein complete obliteration at the level of bladder neck was observed. The rest of the bladder was normal and capacious.

The patient was then counselled in preparation for a planned Mitrofanoff appendicovesicostomy. Routine pre-

operative preparation ensued, including bowel preparation. The operation was performed via a lower midline incision. The anterior bladder was found to be adherent to the anterior abdominal wall, most likely resulting from the long-term suprapubic cystostomy. These adhesions were released successfully via sharp dissection. The appendiceal length was relatively shorter than average, measuring 6 cm after mobilization on the mesoappendix (Figure 2). The appendicovesicostomy was completed, albeit with a short, extravesical antirefluxing tunnel of 1.5 cm. Despite the concerns over the appendiceal channel length, the anastomosis remained tension free as the dome of the bladder was sufficiently pliable after mobilization. An umbilical stoma was created, as the patient had communicated this preference during the preoperative discussions about stomal positioning. A size 16F suprapubic catheter and a size 18F stomal catheter were left in situ.

Postoperatively, no complications were reported. The incisional wound and the umbilical stoma healed well, and the patient was discharged on postoperative day 7 with both a suprapubic catheter and an umbilical stomal catheter. The stomal and suprapubic catheters were removed on postoperative days 14 and 21, respectively. Once the stomal catheter was removed, the patient commenced clean intermittent self-catheterization immediately, and the suprapubic catheter was spigoted for another 7 days. The patient reported a normal sensation of bladder fullness and easy emptying via a Nelaton catheter. He was then followed up for 24 weeks and continued to perform clean intermittent self-catheterization with no difficulty. The patient reported satisfaction with both the cosmesis and functionality of his stoma (Figure 3 and Video). At 1 postoperative year, he had preserved both daytime and nighttime continence, had normal bladder sensation, and reported no erectile dysfunction.

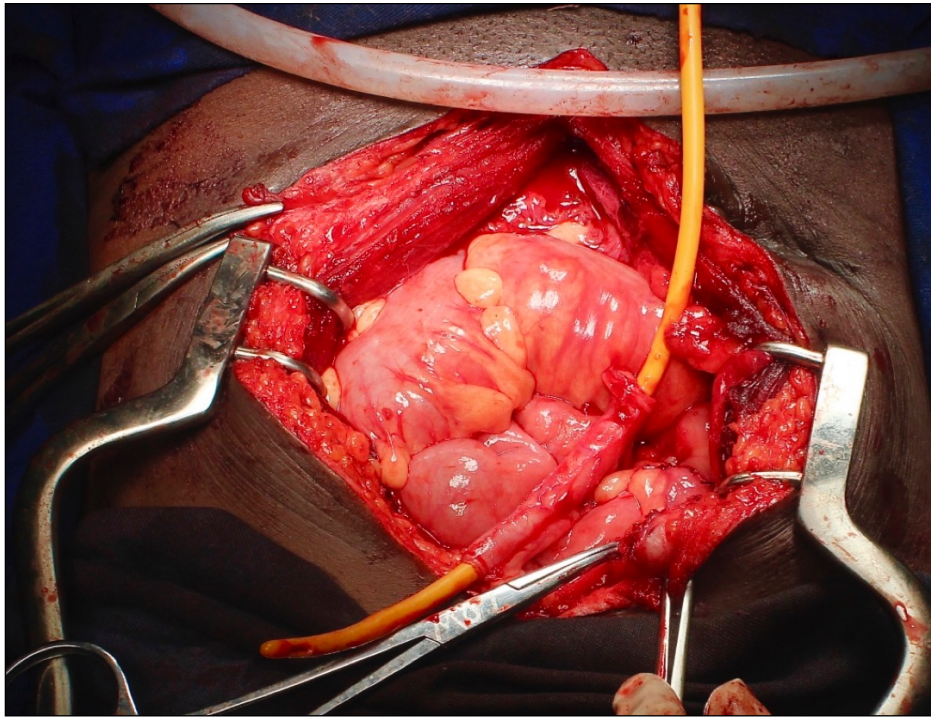


Figure 2. Harvested and catheterized appendix with a 2-way Foley catheter (size 18F)



Figure 3. Postoperatively, the patient was able to successfully perform self-catheterization through the Mitrofanoff stoma (Video).

Discussion

Managing recurrent posterior urethral strictures developing after PFUDD formation is challenging.[3],[4] Stricture length, urethral vascularity, injury extent, and the number of previous repair attempts have been reported as determining factors for successful outcomes after redo urethroplasties.[4] Our patient presented with a history of stricture recurrence, with a long posterior defect as well as bladder neck obliteration, this combination of factors forecasted that another redo urethroplasty would result in a poor outcome. Several tech-

niques are employed in the management of recurrences after initial repair; despite this, no consensus has been reached over the best treatment method after failed PFUDD repairs, as the surgical approach is usually based on patient factors and the available expertise at a particular centre.[4],[7] As evidenced by our case, despite the use of different techniques by different urologists with varying levels of experience over a period of 3 years, treating a complex PFUDD remains a challenging task. Techniques, such as posterior urethral repair via a transabdominal approach or a staged perineal

approach, may be employed to repair PFUDDs.[7],[8] These were considered for our patient; however, in view of the obliterated bladder neck, the risk of incontinence was a major concern for ourselves and the patient. Admittedly, urinary diversion is typically not employed in the management of urethral strictures[5] and is not considered the standard of care. The standard of care for treating posterior strictures is anastomotic urethroplasty, as traumatic posterior strictures are typically short and are, therefore, amenable to such repairs.[7],[8] Our patient—having undergone several attempted repairs—had a significantly long defect as seen in the combined cystourethrogram (Figure 1). This made the option of anastomotic urethroplasty less suitable in our scenario.

For our patient, Mitrofanoff appendicovesicostomy was considered because it is a continent catheterizable option, which allows for preserved continence without reliance on an indwelling catheter. Throughout the course of treatment, our patient had major concerns regarding continence and erectile function and was unwilling to undergo further attempts at redo urethroplasties. Redo PFUDD repairs have been associated with risks of urinary incontinence and erectile dysfunction[7]-[9]; as such, Mitrofanoff appendicovesicostomy was an acceptable treatment modality for our patient.

Mitrofanoff appendicovesicostomy is typically used in paediatric urological practice wherein the major indications include patients with a low leak point pressure and neurogenic bladder; an unreconstructable bladder, such as that associated with bladder exstrophy; or the inability to catheterize the urethra in the context of a neurogenic bladder.[10] In adults, the procedure is used less frequently.[3],[5] Chandrasekhar et al.[11] investigated the Mitrofanoff principle in adults with complex urethral strictures of various causes in a study carried out on patients termed “stricture cripples”. Mitrofanoff urinary diversion was carried out successfully on all patients in the series, and long-term follow-up revealed that their patients continued to self-catheterize with minimal difficulty.[11] Their study highlighted the importance of patient selection in the success of Mitrofanoff appendicovesicostomy diversion: to manage the catheterizable stoma, patients must be dextrous, sufficiently independent, and motivated.[11] Our patient was young, active, and independent, and thus we considered him an ideal candidate for Mitrofanoff appendicovesicostomy. Notably, he also had concerns regarding future fertility. Patients who undergo Mitrofanoff appendicovesicostomy will no longer use the native urethra postoperatively. We discussed this with the patient, and he was willing to undergo assisted reproductive therapies in the future.

Continent urinary diversions are not typically considered among the treatment options for managing complex urethral strictures.[5],[12] There is, however, a role for their use after failed PFUDD repairs.[12] Our case demonstrates the feasibility of continent urinary diversion as a management option after failed PFUDD repairs. However, large multicentre prospective studies would be required to substantiate our experience and define the indications and threshold for offering this treatment option.

Conclusions

Mitrofanoff appendicovesicostomy, though not a novel procedure, could be a low-cost addition to the treatment algorithm for managing patients who have undergone failed PFUDD repairs.

Continent catheterizable urinary diversion using the Mitrofanoff appendicovesicostomy procedure can be done in most LMIC settings, as the procedure does not require highly specialized equipment or complex surgical techniques.

As an alternative to long-term indwelling suprapubic catheterization, Mitrofanoff appendicovesicostomy can be offered as a management option for selected patients with complex PFUDDs.

Mitrofanoff appendicovesicostomy can be used as an alternative to multiple attempts at urethroplasty for complex PFUDDs. The major advantage is that the procedure is reversible; therefore, if the patient has an opportunity for reevaluation in another more well-resourced centre, he could still undergo urethral reconstruction.

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References

1. Fall B, Sow Y, Diallo Y, et al. Urethroplasty for male urethral strictures: experience from a national teaching hospital in Senegal. *Afr J Urol*. 2014;20(2):76-81. doi:10.1016/j.afju.2014.02.003 [\[View Article\]](#)
2. Eshiobo I, Ernest, U. A review of the epidemiology and management of urethral stricture disease in subSaharan Africa. *Curr Med Issues*. 2019;17(4):118-124. doi:10.4103/cmi.cmi_37_19 [\[View Article\]](#)
3. Hosseini J, Kaviani A, Mazloomfard MM, Golshan AR. Monti's procedure as an alternative technique in complex urethral distraction defect. *Int Braz J Urol*. 2010;36(3):317-326. doi:10.1590/S1677-55382010000300008 [\[View Article\]](#) [\[PubMed\]](#)
4. Garg G, Singh M, Kumar M, et al. Outcome of patients with failed pelvic fracture-associated urethral injury repair: A single centre 10-year experience. *Turk J Urol*. 2018;45(2):139-145. doi:10.5152/tud.2018.36824 [\[View Article\]](#) [\[PubMed\]](#)
5. Hillary CJ, Osman NI, Chapple CR. Current trends in urethral stricture management. *Asian J Urol*. 2014;1(1):46-54. doi:10.1016/j.ajur.2015.04.005 [\[View Article\]](#) [\[PubMed\]](#)
6. Sunada T, Kamido S, Hamada A, et al. [Urinary Diversion using an appendicovesicostomy for idiopathic urethral stricture : a case report]. *Hinyokika Kyo*. 2016;62(9):479-482. doi:10.14989/ActaUrolJap_62_9_479 [\[View Article\]](#) [\[PubMed\]](#)
7. Kulkarni SB, Barbagli G, Kulkarni JS, Romano G, Lazzeri M. Posterior urethral stricture after pelvic fracture urethral distraction defects in developing and developed countries, and choice of surgical technique. *J Urol*. 2010;183(3):1049-1054. doi:10.1016/j.juro.2009.11.045 [\[View Article\]](#) [\[PubMed\]](#)
8. Satyagraha P, Adhi Saputra RA. Redo urethroplasty after multiple failure of surgical procedures for complex pelvic fracture urethral distraction defect. *Pan Afr Med J*. 2018;31(1):5. doi:10.11604/pamj.supp.2018.31.1.15597 [\[View Article\]](#)

9. Joshi PM, Batra V, Kulkarni SB. Controversies in the management of pelvic fracture urethral distraction defects. *Turk J Urol.* 2019;45(1):1-6. doi:10.5152/tud.2018.57699 [\[View Article\]](#) [\[PubMed\]](#)
10. Mhiri MN, Bahloul A, Chabchoub K. Appendicovesicostomie de Mitrofanoff chez l'enfant: indications et résultats [Mitrofanoff appendicovesicostomy in children: indication and results]. *Prog Urol.* 2007;17(2):245-249. doi:10.1016/s1166-7087(07)92272-1 [\[View Article\]](#) [\[PubMed\]](#)
11. Chandrasekhar I, Rao AVM. The study of outcome of Mitrofanoff procedure in urinary tract reconstruction. *J Evol Med Dent Sci.* 2015;4(35):6027-6034. doi:10.14260/jemds/2015/878 [\[View Article\]](#)
12. Abedi AR, Ghiasy S, Fallah-Karkan M, Hojjati SA, Hosseini J. Appendicovesicostomy as an alternative procedure for patients with complex urethral distraction defect. *Urol J.* 2020;17(4):386-390. doi:10.22037/uj.v0i0.5592 [\[View Article\]](#) [\[PubMed\]](#)

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