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CASE REPORT

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

Continent Urinary diversion for complex urethral strictures

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Abstract

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

Introduction

Urethral strictures are some of the most common urological conditions treated by urologists in LMICs (1, 2). It has been evidenced that the most common types of strictures treated by urologists in these parts of the world are post traumatic and infectious strictures (1,2). The resulting consequence is a large surgical burden of urethral reconstructive surgery in centers that may not always have the necessary resources and expertise (2). Consequently, patients are subjected to long term indwelling suprapubic catheters which despite being considered a safe and simple treatment of acute or chronic urinary retention, have complications when used for prolonged periods such as infection, catheter retention and risk of malignancy (3). PFUDD which make up a significant portion of post traumatic 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 the use of continent urinary diversions 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 in order to improve urinary continence and reduce the rate of diversion related complications (3).

We present our experience with management of a patient with a pelvic fracture distraction defect (PFUDD) after multiple failed attempts of repair in a low resource center. The aim of the case report is to describe the clinical course of the patient and outline our experience with the use of the Mitrofanoff appendicovesicostomy as a management option in a case of failed PFFUD repairs.

Case presentation

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

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The patient’s medical record reveals that the patient was a poly trauma victim who had been treated for an open pelvic fracture with a hip dislocation in 2015. Initial management of the Pelvic Fracture Urethral Injury was via a supra pubic cystostomy (SPC). He presented five (5) months post trauma and still had an SPC in situ on continuous drainage. Baseline investigations included Full blood count and Kidney function tests that were all within normal reference ranges for his age. A combined cystourethrogram was carried out and revealed a Pelvic fracture urethral disruption defect (PFUDD). The first repair carried out was an Excision and primary anastomosis, however, the patient was readmitted 2 months later with inability to void per urethra, the records are unclear as to whether the supra pubic tube was still in situ at this point or not. A second anastomotic urethroplasty via a perineal approach was carried out in 2016 with an unsuccessful trial without catheter (TWOC) thereafter, the patient continued to use the SPC. Outpatient follow up of the patient continued with an indwelling SPC tube in situ as the patient was unable to void per urethra. The third re-do anastomotic urethroplasty also via a perineal approach, was carried out in 2017, 2 year post initial injury, however, the timing of the Trial without catheter is unclear from the record.

According to the patient’s medical record, he presented to the Urology unit once again in 2018 with complete inability to void per urethra. According to the patient, he had been using the SPC tube since his last discharge as he had been having voiding difficulties since then. A Combined Cystourethrogram (CCUG) was carried out that revealed a long posterior stricture with a blind ending bladder proximal to the bladder neck (Fig 1), this was confirmed on flexible antegrade cystoscopy wherein a complete obliteration at the level of bladder neck was observed. The rest of the bladder was normal and capacious.

The patient was then counselled for a Mitrofanoff appendicovesicostomy. A routine pre operative preparation was carried out that included bowel preparation. The operation was carried out via a lower midline incision with the anterior bladder found to be adherent to the anterior abdominal wall most likely as a result of the long term indwelling SPC, these adhesions were released successfully via sharp dissection. The appendiceal length was relatively shorter than average, and measured 6cm in length after mobilization on the mesoappendix (Fig 2). The appendicovesicostomy was completed with an albeit short, extra vesicle anti refluxing tunnel of 1.5cm. Despite the concerns over the appendiceal channel length, the anastomosis remained tension free as the dome of the bladder was sufficiently pliable after mobilisation. An umbilical stoma was created as this had been the patient’s
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strictures are typically shorter thus amenable to such repairs (7, 8). Our patient having undergone several attempted repairs, had a significantly long defect as seen in the CCUG (Fig 1). This made the option of anastomotic Urethroplasty less favorable in our scenario.

In the case of our patient, the Mitrofanoff appendicovesicostomy was considered due to the benefits of being a continent catheterisable option, this meant preserved continence, and no reliance on an indwelling catheter. Throughout the course of treatment our patient had major concerns regarding continence and erectile function and was unwilling to under go any further attempts at redo urethroplasties. Redo repairs of PFUDD have been associated with risks of urinary incontinence and erectile dysfunction (7, 8, 11), as such, the Mitrofanoff appendicovesicostomy was an acceptable treatment modality to our patient.

The Mitrofanoff appendicovesicostomy is typically used in pediatric urological practice where the major indications include patients with a low leak-point pressure and neurogenic bladder, an unreconstructable bladder such as bladder extrophy or the inability to catheterize the urethra in a neurogenic bladder (9). In adults, the procedure is used less frequently (3, 5), Chandrasekhar et al reported on their experience with the Mitrofanoff principle in adults with complex urethral strictures of varying etiologies, in a study carried out on patients termed “stricture cripples” (10). The Mitrofanoff urinary diversion was carried out successfully on all the patients in the series and on long term follow up their subjects continued to self catheterize with minimal difficulty (10). Of note from their study is that patient selection plays a big role in the success of the Mitrofanoff appendicovesicostomy diversion; patients must be dextrous, sufficiently independent and motivated to be able to manage the catheterisable stoma (10). Our patient is a young, active and independent 24-year old and thus we considered him an ideal candidate for the Mitrofanoff appendicovesicostomy. It is noteworthy that the patient also had concerns regarding future fertility. With a Mitrofanoff appendicovesicostomy the use of the native urethra is abandoned, this was discussed with the patient and he was willing to undergo assisted reproductive therapies (ART) in the future.

Continent urinary diversions are not considered among the treatment options in the management of complex urethral strictures as evidenced in literature (5, 12). There is however a role for their use in the treatment of complex urethral strictures such as those seen in failed PFUDD repairs (12). Our case proves the feasibility, efficacy and success of using a continent urinary diversion as a management option in failed PFUDD repairs.

The role of Mitrofanoff appendicovesicostomy in the management of a pelvic fracture distraction defect in a 24-year-old man after multiple failed reconstruction attempts
However, large multi centre prospective studies would be required to substantiate our experience as well as define the indications and threshold for offering this as a management option.

**Conclusions**

The Mitrofanoff Appendicovesicostomy though not a novel procedure could potentially be a low cost addition to the treatment algorithm in the management of failed PFUDD repairs.

Continent catheterisable urinary diversions using the Mitrofanoff Appendicovesicostomy can be done in most settings that are prevalent in LMICs as the procedure does not require highly specialized equipment or complex surgical techniques.

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

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

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