

PULL-THROUGH URETHROPLASTY FOR A CHALLENGING SECONDARY POSTERIOR URETHRAL STRICTURE A CLINICAL OBSERVATION

STÉNOSES POST TRAUMATIQUE DE L'URÈTRE POSTÉRIEUR PAR LA TECHNIQUE DE PULL-THROUGH A PROPOS D'UNE OBSERVATION

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Résumé :

Nous présentons une observation d'un patient jeune victime d'un traumatisme du bassin avec fracture compliquée d'une sténose de l'urètre prostatique chez qui une uréthroplastie selon la technique de Pullthrough a été réalisée. La technique, les résultats à long terme ainsi qu'une revue de la littérature ont été effectués. Cette technique présente des avantages certains dans les cas de récurrence des sténoses post-traumatiques de l'urètre prostatique après qu'une anastomose termino-terminale a été réalisée avec ou sans utilisation des techniques plus élaborées.

Mots clés : sténose-urètre postérieur- traumatisme-fracture du bassin-technique-Pullthrough

Summary:

We present our experience, technique, and long-term results of the modified urethral pull-through operation for posttraumatic posterior urethral stricture. This case description with positive outcomes shows how this technique can be useful in cases where a urethral stricture from PFUI failed after an end to end anastomosis surgery with or without elaborated techniques. The Comparison with literature also found that the rate of ED can be very low post surgery.

Key words: Stenosis- Posterior Urethra-Pelvic fracture -Technique-Pullthrough

INTRODUCTION

Post-traumatic posterior urethral stricture reconstruction remains a big challenge in Africa, with a high rate of recurrence compared to the global perspective in developed countries.. Additionally, the lack of well-trained reconstructive urologic surgeons is prevalent throughout the Sub-Saharan Africa subregion, resulting in an inadequacy between the complexity of cases and the service provided. An end-to-end anastomosis is the most recommended

technique, with variable results depending on the length of the defect, the severity of the associated periurethral lesion, and the surgeon's expertise. Succeeding in a tight, tension-free, and mucosa-to-mucosa suture is not always easy nor possible, due to scar extension, limited visibility, and poor prostatic apex exposure. In these cases, the Pullthrough technique, despite long-term results varying depending on various authors, might be an alternative surgery, interesting for cases where a direct anastomosis is almost impossible. In this present study, we sought to present one case of pull-through technic for posttraumatic posterior urethral structure long-term results from a case study and did a literature review.

BACKGROUND

Case Presentation

A 29-year-old male was seen with a suprapubic catheter and inability to void per urethra for 14 months. Two years earlier, he sustained a pelvic trauma after a road traffic accident, where he was managed for pubic bone fracture with urinary diversion for urethral injuries. Three months following the injury, he underwent a delayed anastomotic urethroplasty for a posterior urethral distraction defect. His postoperative course was marked by progressive poor stream and effort on micturition that necessitated serial urethral dilation. Six months following the intervention, a suprapubic catheter was reinserted to manage an acute urinary retention. He had since been treated twice for urinary tract infection, which isolated *Escherichia coli* (E. coli) on two urine cultures. He is unmarried but was sexually active before the injury with adequate erectile function. Since the injury, he had lost the nocturnal penile tumescence with no further interest in sexual intercourse. Physical exam revealed an ambulatory patient with a normal gait and a 20 French suprapubic catheter in situ, draining cloudy urine. The penis was flaccid with induration along the perineum. There was no evidence of urethra-cutaneous fistula nor balanitis. The external urethral meatus was adequate. The retrograde urethrogram + voiding cystourethrogram showed a bulbo-membranous

stricture approximately 3 centimeters marked by proximal dilatation along the prostatic urethra and bladder neck. The postvoid film showed an irregular bladder with significant retention of contrast material. Urine culture was sterile and other laboratory exams were normal. He was counseled for an anastomotic or augmented/substitution urethroplasty.

The patient was placed in a lithotomy position, and a transperineal incision was made after a locoregional anesthesia and a dose of prophylactic antibiotic using a one shot of cephalosporine was done. The urethra was exposed by separating the bulbospongiosus muscles. A vascular loop was placed around the bulbar urethra. There was evidence of extensive fibrosis along the posterior bulbar, membranous and prostatic urethra that bled poorly even following incision. The poor vascularity and extensive fibrosis precluded our decision for an anastomotic or augmented/substitution urethroplasty. A flexible cystoscopy was performed through the suprapubic cystostomy and into the bladder neck and prostatic urethra leaving in a guidewire. The urethra was mobilized more distally by separating the corpora bodies. The stricture was excised to bleeding edges, and the proximal edge of bulbar urethra was spatulated dorsally. The anterior urethra was catheterized using a 16 Ch urethral catheter exiting along the spatulation. Four stay sutures 3-0 monofilament were positioned at 3 and 9 O'clock of the proximal bulbar urethral edges. A 24 Ch urethra catheter was passed through the suprapubic opening into the bladder neck over the guidewire and anchored to the sutures. The distal stump of the urethra was pulled through into the bladder by pulling the sutures through the suprapubic opening by gentle traction. The distal end of urethra was then fixed to periurethral and perineal fascia using interrupted 3-0 polygalactin suture to achieve a watertight anastomosis. The urethral catheter was removed after 21 days following a normal pericatheter cystourethrogram. The suprapubic catheter was removed 7 days later after the patient showed a good urinary stream (3). He remained continent after the intervention. However, one month postoperatively, there were complaints of erectile dysfunction. He subsequently responded well to doses of tadalafil after several years of follow up he is still fine with miction and sexual function.

DISCUSSION

Pelvic Fracture Urethral Injury (PFUI) occurs in 1.6% to 25% of pelvic fractures, giving a frequency of 0.32–5/100,000 for men and 0.46–7.25/100,000 for women [1, 2]. There is a rising number of high-velocity pelvic trauma caused by motor vehicle accidents (MVAs) in low and middle-income countries [3]. These lesions can lead to complex urethral strictures that require an anastomotic end-to-end procedure with a 25 %

recurrence rate [4- 7] after Primary anastomosis the gold standard for these lesions. However, due to the mechanism of action, the perilesional fibrotic tissue surrounding the stricture, the length of the stricture, and the history of previous unsuccessful repair, more complex lesions can occur, with defects exceeding 3 cm. For these lesions, to achieve a tension free anastomosis, more elaborate techniques can be used by perineal, abdominal, or combined approaches associated with or without supracrural rerouting, pubic bone resection, or corpus cavernosum splitting approach. Despite using these approaches, performing a tied suture between the proximal urethra and the distal end of the urethra when visibility and exposure are poor can be very challenging, explaining the high failure rate [4-7] mainly attributed to incomplete excision of scars covering the proximal urethral stump and a difficult to realize a tension-free anastomosis [8,9]. One another way, using the more elaborated technique can provide good surgical results but at the expense of higher ED rate. For instance, the final success rate of redo-urethroplasty with redo inferior pubectomy was 100% (31/31). But the incidence of ED after surgery was 77.4% (24/31) from wang's series [10]. To avoid this major side effect and To overcome the inadequate access of the proximal urethra part, the so-called pull-through technique, which consists of mobilizing the distal urethral flap, approximated to the proximal urethral, is a great alternative in specific cases where exposure and suturing are difficult and fibrotic tissue present. A 66 % success rate of the original technique was described by Netto [11], while some technical variants may improve this success rate to 96% to 100% of successful cure. In fact, with the regular urethral pull-through technique, the force applied to pull the distal urethral flap to the proximal urethra cannot be well determined. This may explain the low success rate of this technique. With the modified urethral pull-through technique, the force required can be well controlled. Since the distal urethral end is fixed to the catheter, which can withstand some tension in the pulling action. During our case, the perineal route was combined with the abdominal approach allowing a visual control of traction suture around the catheter by using a scope, a suprapubic drainage was maintained afterward. After keeping the catheter for three weeks, removing the catheter went smoothly while the maintaining suture were absorbed easily. The long duration of catheterization explain the occurring of small calcification around the catheter. Wang and al [12], had the most important published series of cases with this technique. In his study, a total of 113 patients with posttraumatic posterior urethral stricture resulting from pelvic fracture injury underwent the modified urethral pull-through operation. The mean Stricture length was 2.6 (1.5 to 4.7 cm). After a 12 to 86 months (mean 48.5) follow up, 109 patients were

symptom-free and required no further procedures. A success rate of 96.5%, with a final success rate of 100% was obtained after conservative management (dilatation and endoscopic incision) for the 4 failed cases. The utility of this pull-through technique is verified with recurrent stricture after several attempts, as our patient and as Wang mentioned in his paper. Before this definitive surgical therapy, 52 of the 113 patients (46.0%) underwent previous surgical repairs, including DVIU in 23 (20.4%) with multiple urethrotomies in 16 and failed attempts at open reconstruction in 29 (25.7%), consisting of direct end-to-end anastomosis in 6, bulboprostic anastomosis in 13 and the regular urethral pull-through operation in 10. The efficacy of this technic in recurrent cases is more than important in our African context, where the lack of centers and experts well trained to tackle difficult urethroplasty cases is a reality leading to a high number of redo cases. As our patient, who had one urethroplasty attempt and several dilatation. The frequency of recurrent cases and their high level of complexity due to fibrosis, infection, multiple dilatations, and late management make it very challenging. They are often associated with bone lesions that add to the scarring of periurethral tissue and make it very difficult for the surgeon to achieve a tension-free end-to-end anastomosis with the elaborated the Pullthrough technique opening better opportunities for full recovering. As usual, depending on the previous status of patient's sexual function, ED can be secondary to the trauma or related to the recurrent operations. In Wang's series, 21% of the patients had ED, due to the trauma in 19 cases, while only 5 (4,4 %) was from the Urethroplasty with very good evolution with time spontaneously or under medical management. As well as our clinical observation who had presented with a moderate ED postoperatively that has been managed successfully with pharmacological treatment and he recovered a normal sexual life thereafter making the Pullthrough technique an acceptable option for specific cases.

CONCLUSION:

The Pullthrough urethroplasty technique can be a good alternative for failed urethral stricture repair after pelvic trauma and recurrent cases after end-to-end anastomosis with or without a more elaborate technique. This technique offer the advantage of a close connection between the proximal urethra and the distal part of urethra. An extended excision of scarred tissue from urethra and on the prostatic apex can lead to a higher successful results without added complications particularly ED.

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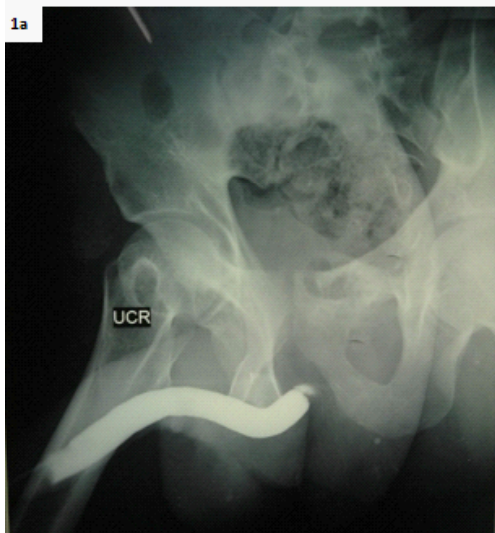


Figure 1a: is a retrograde urethrogram.

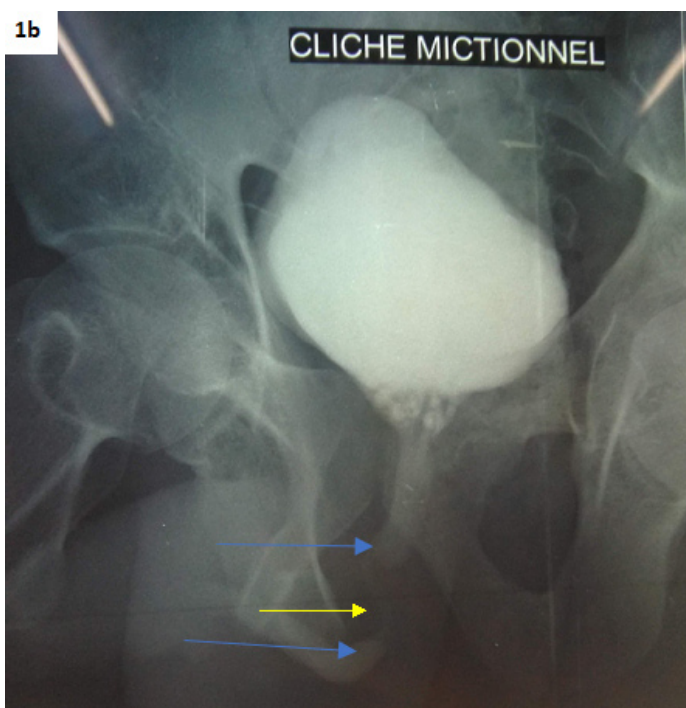


Figure 1b: is a voiding cystourethrogram showing a zone of stricture along the bulbo-membranous urethra approximate 3 cm long with proximal dilatation at the bladder neck



Figure 1c: is the postvoid film showing an irregular bladder with significant retention of contrast material

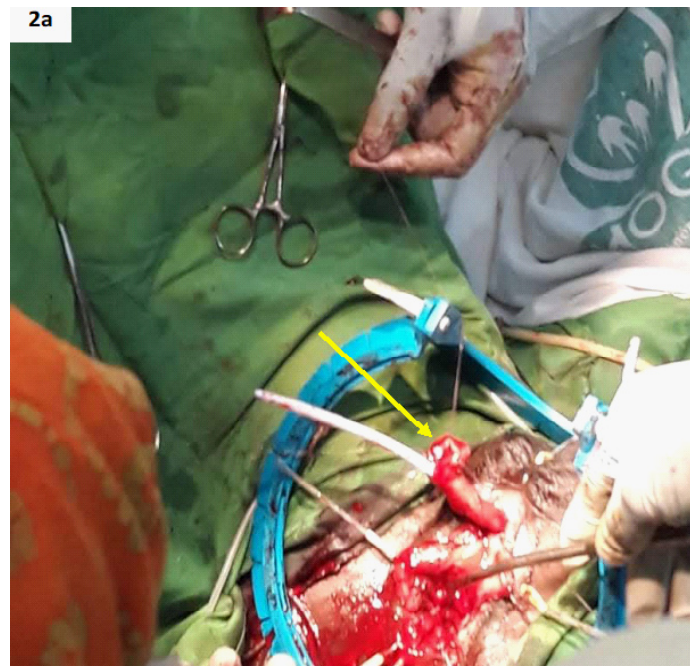


Figure 2a reveals the mobilization of the bulbar urethra, dorsal spatulation at the edges (yellow arrow) and urethral catheterization.

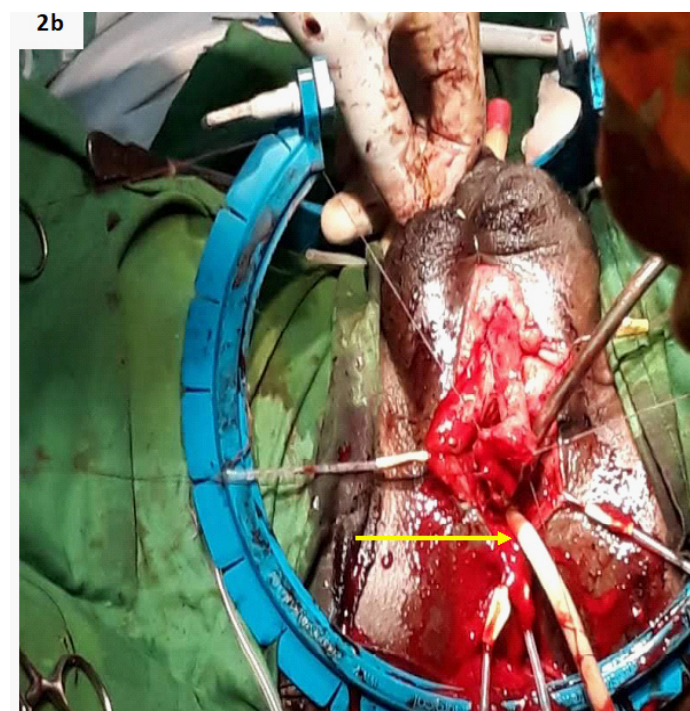


Figure 2b shows insertion of monofilament 3.0 stay sutures at 3 and 9 o'clock with a 24 Ch urethral catheter pass through the suprapubic opening into the bladder neck hanging through the perineal incision (yellow arrow).

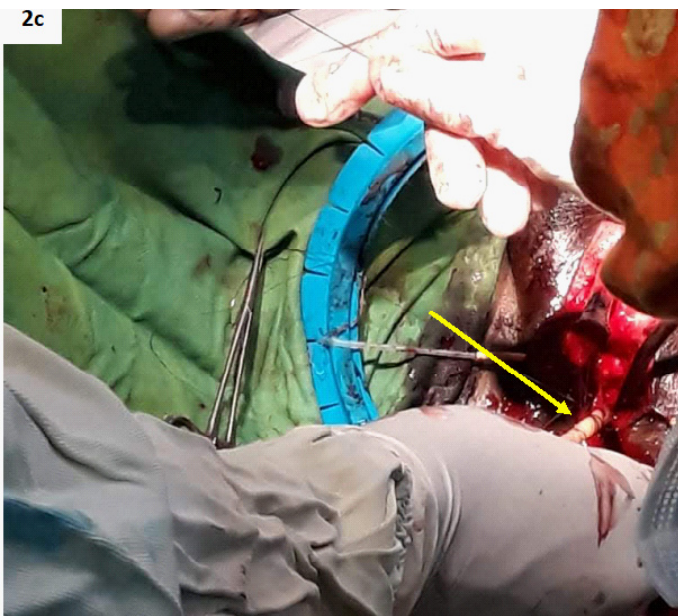
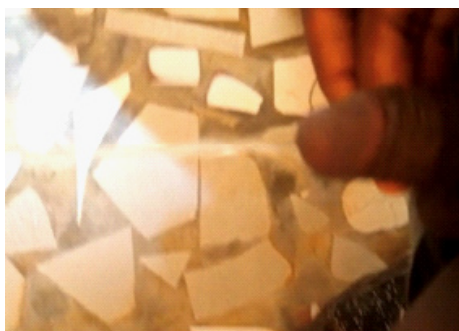


Figure 2 (a-c): Figure 2c shows the suture attached to the 24 Ch catheter and pull into the bladder under gentle traction (yellow arrow)



A



B

Figure 3 : (a) Straight Stream after removal of catheter/ Picture sent by the patient himself (b) note the presence of calcification around the catheter before removal (sent by the patient few days before catheter removal)