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Original Research Article

Posterior urethroplasty: indications and results, a six years' experience from two teaching hospitals in Iraq

Sami Hamad Oleiwi Masaoodi[1]*, Abdulraheem Ali Bakheet Al-Gaysi[1], Faris M. ALbadran[2]

[1]Department of Urology, Al-Karama Teaching Hospital, Baghdad, Iraq
[2]Department of Urology, Al-Hussain teaching hospital, Karbala, Iraq

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***Correspondence:**
Dr. Sami Hamad Oleiwi Masaoodi,
E-mail: saim12332311@gmail.com

ABSTRACT

Background: Posterior urethral strictures remain an everyday challenge in urological practice. Different types of operations to repair the stricture have different outcome concerning re-establishment of the urethral function and anatomy. Posterior urethroplasty is one of the frequently chosen operations. The aim of this study is to reveal indications, results and complications of posterior urethroplasty performed on fifteen patients with long posterior urethral strictures in a major urological center.
Methods: Fifteen male patients have undergone anastomotic perineal urethroplasty for long posterior urethral strictures in the period from September 2010 to August 2016. The patients age ranged between 12-42 years (mean =28). They were referred to Al-Karama urological center from emergency hospitals, and Al-Hussain teaching hospital came to medical consultation to the center with established strictures. They were evaluated thoroughly pre-operatively with cystogram and retrograde urethrogram (RUGs).
Results: Success rate was 66.7%. The follow-up period was short, no patient needed re-operation. Most had normal caliber urinary stream and required no optical urethroplasty or dilation. Failure noticed in two patients, one of them developed impotence post-operatively.
Conclusions: The study concludes that open perineal urethroplasty remains the gold standard for the management of long posterior urethral strictures.

Keywords: Baghdad, Indications, Posterior, Urethroplasty

INTRODUCTION

Posterior urethral strictures can be defined as a bulbo-prostatic urethral gap or defect which results from complete urethral disruption. This gap is occupied by fibrosed organized hematoma formed between the distracted two ends of the urethra, dt the time of pelvic fracture injury.

Rarely, they are in the form of a genuine strictured segment of the urethra with preservation.[1]

Optimal treatment of posterior urethral strictures is still an issue of controversy.[1] They represent a real surgical challenge in urological practice. Selected group of patients were proved to benefit from various endoscopic procedures, on the top of which are 'internal optical urethrotomy and urethral dilatation. However, these two commonly used techniques were seen to be associated with a high recurrence rate, so new endoscopic methods were adopted such as neodymium: YAG Laser, and other than Laser as balloon dilatation, endoscopic urethroplasty cut to the light, core through, and stent placement.[2] These

newly introduced methods have variable success rate depending on the proper method selection, and on the length and extent of urethral scar.[2]

Initial treatment of short urethral strictures (<0.5cm) is usually successive gentle urethral dilatation.[2]

Internal optical urethrotomy is the next step in case of recurrence of stricture.[2] Internal optical urethrotomy is also recommended in short strictures that are the sequelae of a distraction injury for which early catheterization resulting in urethral continuity was possible.[1] And as such, author notice that the management of urethral stricture runs in a "stepwise ladder fashion" (if one may say), shifting to the higher step in case the previous one fails or starting from that higher step initially.[2] On the top of this ladder is the open perineal urethroplasty (end-to-end anastomosis), which is reserved for long urethral strictures (>2cm in length).[2]

This type of urethral strictures usually occurs in patients who sustain severe trauma as road traffic accident (RTA), with pelvic bones fractures. A less common type of these strictures is direct blunt trauma to the perineum (shear injury).[3-5] The mechanism of this type of injury is proposed to be sudden rostral migration of the prostate and bladder, which tends to stretch the urethra at the prostate- urethral junction; rarely bone edges may also lacerate the urethra in men.[6]

This group of patients presents clinically with the triad of: blood on urethral meatus, inability to urinate, and palpable full bladder, especially if they have received a good amount of intravenous fluid as part of resuscitation process on reception; this triad herald's urethral disruption. Blood is present in about 50% of significant urethral injuries.[7] It is worth mentioning that the amount of meatal bleeding does not correlate with the severity of the urethral injury.[8] However, urethral disruption is only precisely diagnosed by combined suprapubic cystogram and retrograde urthrogram (RUG).

Digital rectal examination may reveal high-riding prostate.[9] An attempt of passing urethral catheter is advocated in certain cases.[3]

Formal suprapubic cystostomy is usually done in operating room as a part of surgical exploration of the patient for other associated injuries; together with bladder exploration, and repair of any bladder injuries. Suprapubic drainage is maintained until associated injuries have healed and the patient can be places appropriately for the reconstructive procedure which my take from 3 to 12 months.[1] At three months, the resulting hematoma resolves and scar tissues at the injury site become stable (complete fibrosis) complete ambulation of the patient. At this stage, perianal urethroplasty comes into play, especially with long strictures. All of the patients fall into this group.

The aim of this study is to reveal indications, result and complications of posterior urethroplasty performed on nine patients with long posterior urethral strictures in a major urological center.

METHODS

From September 2010 to August 2016, fifteen male patients diagnosed with long posterior with excision of the strictured segment, spatulation, and end-to-end anastomosis.

On presentation, all patients have had suprapubic cystostomy as a primary measure in the management at time of injury. The patient's age, history, etiology of stricture, physical examination, and appropriate laboratory investigations were reported.

Suprapubic cystostography simultaneously combined with retrograde urethrogram (RUG) were obtained for each. The patient is asked to void with the bladder filled. Urethrography is done by using a catheter suitable for the patient's age, pushed 1 to 2cm into the fossa navicularis, balloon inflated with 1 to 2ml of water, and radio-opaque contrast media is injected by a 60ml syringe. Urethrocystoscopy is done for some patients for endoscopic assessment.

Surgical approach of urethroplasty was performed by using perineal longitudinal incision with the patient in lithotomy position. One urethral dilator was passed retrogradely up the urethra to the strictured area. Another urethral sound is negotiated through the suprapubic route down the bladder neck to the proximal end of the stricture Tips of both dilators can be palpated through the incision in alignment with the urethral curve. Meticulous exploration and excision of the scarred (hematoma fibrosis) segment was done using sharp dissection and appropriate hemostasis until the tow fresh ends of the urethra were visualized which were then spatulated in reverse angles. An appropriate size silicone (usually 16 F) catheter then passed up the urethra bridging the gap of stricture, after a stitch was taken dorsally, finds its way through the proximal urethra to the bladder.

Circumferential sutures (4/0 chromic catgut) were taken to complete the tension-free end-to-end anastomosis of cut urethra rendering it water-tight. Patency of the catheter was ensured, and closure done in layers with corrugate tube drainage placed.

Pure perineal approach was used in all patients no abdominal or transpubic (partial or complete) approach ensure a decreased intravesical pressure and suprapubic urinary diversion, as the urethral catheter was mainly for stenting.

Post-operatively, antibiotic cover, mainly cefotaxime injections, was used to prevent postoperative infection. After a short hospital stay, patients were discharged in

full ambulation. Urethral catheter was removed 4 weeks later after the suprapubic catheter was clamped and the patient is allowed to void spontaneously. In case of no difficulty in micturition, the suprapubic tube is removed. Each patient is given appointment to be seen 3, 6, and 12 months after surgery. Follow-up depended on direct questioning regarding passing normal urinary stream and retrograde urethrogram (RUG), if necessary.

RESULTS

The patients age ranged between 12-42 years (mean =28 years). In 10 (66.6%) of them, the cause of stricture was road traffic accidents. One had a direct blunt trauma to the perineum resulted in partial urethral injury rendered complete injury after catheterization and the injury was complicated by urethra cutaneous fistula. Another patient had blunt trauma with fracture pelvis. In one patient with RTA, immediate rail-roading was attempted but failed to heal the urethral injury. This failure necessitated the urethroplasty later on. The causes of urethral injuries in 15 patients are shown below.

Table 1: Causes of urethral injuries.

Cause	Number (%)
Road traffic accident	10(66.6%)
Bullet injury	2(13.3%)
Iatrogenic	3(20%)

The length of strictures ranged between 2-5cm, with a median of 3. Indications for urethroplasty were mainly established long posterior urethral strictures in 13 patients (86.67%) and failure of lower ladder-step methods as urethral dilatation and internal optical urethrotomy in one patient. Follow-up period ranged between 8-15 months (average 11.5months). They were followed up by urtheroscopy and retrograde urethrogram. Although the post-operative period was short, normal retrograde urethrograms were demonstrated in most patients at 3-month interval, in addition, no significant recurrence of urethral stricture was reported to date. Complications were recurrent strictures in 3 patients necessitating optical urethrotomy or dilatation and urethra cutaneous fistula in one patient, who also suffered from impotence.

Table 2: Comparative studies.

Studies	No. of patients	Success rate	Complication
Current study	15	66.7%	33.3%(recurrence impotence)
Khoraitim et al	39	98%	5%(impotence)
Santcucci et al	102	90%	10%(failure)
Hanash et al	35	84%	17%(impotence)

All patients were continent post-operatively. Success rate was 66.7%. A comparison of present study including success rate and complications to other international studies is shown in table 2.

DISCUSSION

Posterior urethral strictures and distractions are seen most commonly in the young male patients. The male to female ratio is 49:1. The anatomic nature of the male urethra, especially being longer, should explain this observation. However, girls younger than 17 years have a significantly increased risk of urethral injury compared with women perhaps owing to greater compressibility of the pelvic bones .[10]

Urethral strictures are the aftermath of complete urethral injury that are associated with pelvic fractures (4-14%), or they occur as sequelae of direct blunt injury to the perineum (shear injury).[8] This imposes a genuine clinical problem that affects the quality of life of victim, since it is injury associated with the impact of trauma as fractured bones or injury to other viscera, thus the patient usually undergoes urgent surgical intervention, on reception, mainly laparotomy with associated blood loss, then after the dependency on suprapubic cystostomy prior to urethroplasty, and finally the stress of the operation and the intervening urethra-cystoscopies, if needed, all will add to the suffering of the patient.

In such a profile, taking the right decision in the right time is essential, if not life-saving. If the patient would not benefit from the lower steps of ladder of management, a daring jump to the top of the ladder, i.e. urethroplasty, would save the patient a lot of time and suffering in useless urethral dilatation or other modalities of treatment.

In contrast, many authors have advocated repair of the urethra at time of injury, Indeed, an established school adopts this kind of treatment. This is called "primary alignment" of the urethra.[7] Originally it meant immediate open repair by removing pelvic hematoma, dissecting tissues, and suturing the severed urethra under direct vision. However, the term has changed to mean "indirect" or endoscopically assisted stenting of the distraction with a urethral catheter, without any pelvic dissection or sutures.[4] The primary alignment with pelvic dissection entails a great morbidity as impotence, incontinence, stricture formation, and operative blood loss.[11,12]

In case of incomplete or partial urethral injuries, a urologist should attempt the placement of a urethral catheter (a 16 F silicone catheter). The second endoscopic approach requires certain conditions. It should never be performed in hemo-dynamically unstable multiple-injury patients, and highly meticulous technique by an expert surgeon only should be used. In the wrong hands, this may end up in a catastrophe, but if done appropriately, it will have many advantages as reported by many authors. It can lead to complete urethral healing without stricture (Morehouse and Mackinnon), can also ease the difficulty

of posterior urethroplasty later on by aligning the prostate and urethra shortening the gap and subsequently the length of the stricture. The optimum time for primary alignment is within 72 hours of the injury the sooner the better.[13,14]

Since this is not practical or feasible in the country, almost all urethral injuries are managed by placing a suparapubic catheter waiting for an establishment of fibrotic tissues at urethral gap to end up with anastmotic urethroplasty. So, open perineal urethroplasty remains the gold standard for the management of long posterior urethral strictures with high success rate in many studies all over the world. However, in rate cases of female urethral distraction injury, some authors have suggested immediate open realignment to avoid subsequent urethra-vaginal fistulae or urethral stricture.[1]

Endoscopc procedures, such as cutting a tunnel between the two ends of the avulsed urethra (cut-to the light procedure), can have unacceptable failure and complication rates, including coring of false passage that inadvertently bypasses the bladder neck. Pro-operative MRI, prior to perineal urethroplasty, is deemed necessary by some authors, since it can reveal the presence of associated corporal rupture, corporal body avulsion, and significant ischial fractures that may interfere with perineal repair. In a recent study based on 27 years' experience with anastamotic posterior urethroplasty concluded that" of the operative details (of urethroplasty), 3 constitute the gold triad that assures a succeful outcome, namely, complete excision of scarred tissues, fixation of healthy tension-free anastomosis.[6]

Santcucci et al defined success of anastomotic urethroplasty as the lack of need for subsequent dilation and/or internal optical urethrotomy, or urethroplasty. Accordingly, most of the patients comply with this definition; they regained their ability to void normally spontaneously.

CONCLUSION

No optimal management of posterior urethral strictures is agreed upon by urologist worldwide. However, open perineal urethroplasty remains the gold standard for such type of strictures, especially if done at the appropriate time with correct indication. In addition, operative technique plays the vital role in the outcome. In the group of patients in this study author noticed a good success rate for patients who were directly brought to urethroplasty without delay or have less intervening procedures as urethral dilation or internal optical urethrotomy.

Author recommend education of physicians in remote peripheral and emergency hospitals about the importance of early referral of patients suspected to have posterior urethral injuries.

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