

Primaryb realignment of Traumatic posterior urethral rupture.

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Abstract

Background: Posterior urethral rupture remains one of the most difficult and controversial injuries to treat and its management still controversial.

Aim: To assess the effect of primary realignment of posterior urethral rupture.

Methods: in this study, 20 patients (mean age 24.7 years, range 12 to 39 years) were admitted to al-kindey teaching hospital, Baghdad, Iraq, with complete posterior urethral rupture associated with fractured pelvis following trauma (3 cases of fall from high, 17 cases of road traffic accidents). All the patients were operated upon at the day of accident to establish the alignment of the posterior urethra on a Foley's catheter with bladder drainage by suprapubic catheter. Patients were evaluated post-operatively for urinary incontinence, erectile

dysfunction, and urethral stricture. They were followed up for a mean period of 17 months (range, 10 to 20 months).

Results: posterior urethral rupture was associated with pelvic fractures in 18 of 20 patients (90%), and only one case had bladder rupture (5%). Seven patients (35%) had evidence of post operative stricture. Erectile dysfunction was reported by 2 patients (10%). none of the patients had urinary incontinence.

Conclusion: Primary realignment of PUR is a simple procedure associated with low morbidity. It is recommended for patients who are stable and have no other significant intra-abdominal and pelvic organ injuries.

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Introduction

About 10 - 15% of cases of fractured pelvis have posterior urethral rupture (PUR), which is associated with considerable morbidities such as incontinence, erectile dysfunction(ED), and urethral stricture⁽¹⁾.

Posterior urethral rupture remains one of the most difficult and controversial injuries to treat. Some urologists advise initial placement of a suprapubic cystostomy followed by delayed urethroplasty 3 to 6 months later, while others suggest immediate realignment⁽²⁾.

The definition of primary realignment refers to immediate stenting of urethral distraction with a catheter without pelvic dissection or suture⁽³⁾. In the present study, we review our experience with primary realignment of PUR and report its outcome and complications. The aim of this study was to assess the effect of primary realignment of posterior urethral rupture.

Methods

This study was carried out on 20 male patients (mean age, 24.7 years, range 12 to 39 years) who presented to Al- kindey teaching hospital of the university, Baghdad, Iraq between April 2004 and September 2009 with PUR due to injury who underwent primary realignment in Al- kindey

teaching hospital. PURs were diagnosed and confirmed by history, physical examination, and retrograde urethrography.

Blood at the external meatus was the single most important clinical diagnostic sign for urethral injury.

Complete PUR was diagnosed on the appearance of gross extravasations of contrast medium at the area of the membranous urethra with no contrast entering the prostatic urethra or bladder at all.

Surgical technique: After complete stabilization of the general condition of the patients they were taken to the operating room for surgical exploration. All explored patients received broad spectrum antibiotics (ampiclox 500mg, intravenous) at induction of anaesthesia. Through a lower midline infraumbilical incision, a vertical cystostomy incision is made under direct vision, Two interlocking metal sounds were introduced gently, one through the bladder neck and the other through the external meatus. When they touched each other and a clink was heard the distal sound was guided into the bladder. A straight nasogastric tube No.12 Fr. was fixed to tip of the sound and brought out through the urethra. A silicone Foley's catheter (mostly No.16 or 18 Fr.) was sutured to the straight nasogastric tube and pulled gently into the bladder. A suprapubic Foley's catheter was placed in the dome of the bladder and the bladder was closed in 2 layers.

Urethral Foley's catheter was removed at 8 weeks when a retrograde urethrography around the Foley's catheter show no extravasation of contrast medium.

The suprapubic cystostomy was clamped, but left in place. If the patient voids normally and easily per urethra the cystostomy catheter was removed 2 weeks later.

Results:

The age of the patients in this study ranged from 12 to 39 years with average of 24.7 years, all of them were males. The most common mechanisms of injury in our patients, in order of frequency, are shown in Table 1.

Eighteen patients (90%) had pelvic fractures, and one (5%) had both pelvic fracture and bladder rupture. All patients had no visceral injury, underwent surgical operation within 10 hours

after injury, and they were potent and continent before the accident.

The patients were followed up for more than 12 months. On follow up, all patients reported good urinary continence. Thirteen patients (65%) had no symptoms or radiological evidence of urethral stricture. Seven patients (35%) had strictures on retrograde urethrography that were treated with urethral dilatation and/or direct optical internal urethrotomy. Of these, 5 patients required 3 times optical internal urethrotomy under general anesthesia with multiple urethral dilatation under local anesthesia every 2 month intervals, while 2 out of 7 required 2 times optical internal urethrotomy under general anesthesia with multiple urethral dilatation under local anesthesia every 2 month intervals . None required open urethroplasty.

Eighteen (90%) patients reported a normal erection, while 2 (10%) patients complained of potency problems that responded to sildenafil, 100 mg daily.

The mean operative time for primary realignment was 60 ± 5 minutes (range, 50 to 80 minutes).

Table 1. Mechanisms of posterior urethral rupture in 20 patients.

Mechanisms of injury	Number of patients (%)
Car accident	15 (75%)
Motorcycle accident	2 (10%)
Fall from height	3 (15%)
Total	20 (100%)

Discussion:

The PUR is one of the worst types of genitourinary trauma with 3 significant complications: erectile dysfunction, urethral stricture, and urinary incontinence. The management of PUR is still controversial^(4, 5, 6, 7, and 8). In the present study, we showed that primary realignment was with no urinary incontinence, a low rate of erectile dysfunction, and a relatively low rate of urinary tract strictures that were treated successfully. Some studies have shown that initial suprapubic cystostomy and delayed urethroplasty, 3 to 6 months later produces less complication than does primary realignment⁶, while other studies have shown the opposite^{7,8}.

Historically, these injuries were treated by an early realignment and stenting of the urethra. The bladder was then drained through a suprapubic catheter and a retropubic drain was established⁹. A more aggressive way of management recommended immediate surgical exploration with evacuation of the retropubic haematoma and suture repair of the ruptured urethral ends with or without traction sutures from the prostate to the perineum^(9, 10, and 11).

Johansson in 1953 advocated initial management by suprapubic catheterization only, avoiding urethral instrumentation and management of the resulting strictures by urethroplasty 3-4 months later, his thesis was based on the postulation that urethral manipulations increased the risks of impotence and incontinence, he also stated that the hematoma formed would undergo re-absorption and allow the prostate to settle down

to its position with 1-2 cm stricture⁽¹²⁾. This technique was popularized by Morehouse and associates⁽¹³⁾ and was universally adopted in North America and kept so for one and a half decades^(6, 14). In the late 1980s, however, voices calling once more for early realignment of the urethra were heard^(6-9, 14), with data to show that this technique did not change the incidence of impotence. They also demonstrated that with early alignment of the ruptured urethra some patients did not develop stricture at all and that stricture, if formed, would be short and easily managed by internal urethrotomy or dilatation without the need for open surgery.

On the other hand, suprapubic diversion only (Johansson's technique) resulted in long strictures (1-4 cm long) in 96-100% of published experience with this technique^(4, 7, 12, and 14). On the contrary, in studies where this injury was managed by early realignment of the urethra, the cumulative incidences of stricture in 320 cases was 54% (range from 14 - 75%)^(4, 5, 7, 10). The main disadvantages of delayed urethroplasty are urethral stricture in approximately 100% of patients and the need for a second operation with its potential complications such as impotence and incontinence⁽¹⁾. Conversely, primary realignment reduces the requirement for secondary open urethroplasty, and in addition, the majority of strictures can be treated with urethral dilatation and/or direct vision internal urethrotomy⁽⁸⁾.

The quality of stricture formed after realignment is very important. With good antibiotic coverage and the use of silicon catheters, urethral stricture, if formed, is in most cases short (less than 1/2 cm) which is easily managed by repeated dilations or visual urethrotomies⁽¹⁴⁾.

During exploration and realignment of the urethra the retropubic space should not be explored for fear of introduction of infection particularly to the hematoma with the possibility of pelvic abscess formation.

The reported rate of urinary incontinence is lower in primary alignment than that in delayed urethroplasty which is mainly due to higher incidence of external sphincter damage in delayed urethroplasty which was (2-8%)^(5, 6). In 2 studies on primary realignment, urinary incontinence was present in 0% and 3.7% of the patients and none of the patients in the latter study needed treatment.^(3, 5)

We had no cases of incontinence. Thus, it seems that primary realignment can be done with no serious impact on the patient's continence which is due to less manipulation of the external sphincter during primary realignment. In

addition, we used no traction on the urethral Foley's catheter, which prevents ischemic

Damage to the internal urethral sphincter, which is very important in maintaining continence.

Causes of erectile dysfunction following PUR are not understood. Dhabuwala and associates have noted that impotence is caused by the original injury and is not due to the urethral repair.⁽⁹⁾ In a report by Tunc and colleagues,⁽¹⁰⁾ erectile dysfunction was attributed to delayed urethral reconstruction in 16.2% of patients. It is likely that injury to the autonomic plexus in patients with pelvic fractures, or injury to the nervi erigentes in the neurovascular bundles dorsolateral to the prostatomembranous urethra contributes to erectile dysfunction.⁽⁸⁾ In our study, two patients developed decreased firmness of erection & both responded to sildenafil (100 mg) and gradually improved significantly. The low rate of impotence was explained by avoidance of vigorous urethral manipulations that reduce the possibility of injury to the neurovascular supply of the penis that result in impotence.

Conclusion

Primary realignment of urethra should be performed, where possible, during the initial management of traumatic rupture of the membranous urethra. It should be done in a very gentle way so as not to cause any damage to the neurovascular supply of the penis. This technique is useful for patients who are stable with no other significant intra-abdominal or pelvic organ injuries. The procedure should be done under antibiotic cover and with the use of silicon catheters for at least 6 weeks.

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