

Anterior Urethral Disruption in a Female Patient with a Traumatic Pelvic Fracture

Paul J.S., Facs and Claudia E. Goettler
Department of Surgery, East Carolina University,
Brody School of Medicine Greenville, NC USA 27858-4354

Abstract: This case report demonstrates an anterior urethral disruption in a female patient with a pelvic fracture. Compared to male patients the incidence of this injury in females is significantly less occurring between 0-5%. Unlike male patients retrograde urethrogram may be difficult and urethroscopy is frequently required. Whereas male patients are typically treated with urinary catheter female patients often require surgical repair of this injury.

Key words: Anterior, urethral disruption, pelvic fracture injury

CASE REPORT

A 51 year old female presented to our rural level I trauma center after being fallen upon by a horse. Apparently, the horse fell to its side thereby rolling over the rider. At initial presentation, she required fluid resuscitation for hypotension and tachycardia. Significant positive physical exam findings included an open pelvic fracture with protrusion of bone fragments through the vagina and blood noted at the urethral meatus. No other injuries were identified.

Radiographic evaluation of the pelvic fracture included both anterior-posterior pelvic x-ray and CT scan. These studies revealed an open book type pelvic fracture with diastasis of both sacroiliac joints and symphysis, fractures of the left pubic bone, sacral ala and subcutaneous emphysema extending into the extraperitoneal space of the pelvis. A small soft tissue arterial-venous fistula in the left groin was identified but no evidence of frank vascular extravasation was appreciated. CT scan did not reveal injury to either kidney. A pelvic arteriogram confirmed no evidence of bleeding from the internal iliac artery or its branches.

The patient then underwent a retrograde urethrogram through a foley catheter placed at the entrance of the urethra (Fig.1). This study revealed extravasation of contrast into the soft tissues of the pelvis but no contrast in the bladder. Contrast did fill the distal/external portion of the urethra. The faint contrast in the bladder seen in Fig. 1 is the result of the earlier CT scan. A suprapubic tube was subsequently placed under fluoroscopic guidance.

Following these diagnostic and therapeutic procedures, the patient underwent application of an external fixator for her pelvic fracture, vaginal laceration repair and urethroscopy. This urethroscopy revealed a nearly 50% anterior disruption of the urethra from the 3 to 9 O'clock position. A guide wire was successfully passed into the bladder followed by placement of a 16-Fr council-tip urinary drainage catheter.

The postoperative course was uncomplicated and the suprapubic tube was removed prior to discharge. The urinary catheter was removed 6 weeks after initial placement. A follow-up retrograde urethrogram revealed no evidence of extravasation or stricture. At one year follow-up the patient has had no evidence of urinary retention, urinary stricture, incontinence, or sexual dysfunction.

DISCUSSION

The association of lower urinary tract injuries and pelvic fractures have long been recognized. The presence of gross hematuria or blood at the urethral meatus is a cardinal sign of serious injury and has been noted in up to 91% of patients with bladder or urethral disruption¹, whereas microscopic hematuria is not². Other findings suggestive of urethral disruption include perineal or genital hematoma, inability to void in setting of a full bladder, and free-floating prostate^{1,2}.

Urethral injuries have been reported in 3.5-25% of male patients with pelvic fractures, with an overall mean of approximately 15%^{1,3-5}. In their 1965 study⁵ of pelvic fractures, Kaiser and Farrows stated this injury in females



Fig. 1: Retrograde urethroscopy demonstrating contrast outside urethra due to anterior disruption

was nonexistent. Similarly, in 1992 Carter and Schafer identified the incidence of urethral disruption in females as zero^[6]. However, in the same year a study by Perry and Hussmann found the incidence of urethral disruption in females occurs in up to 4.6%^[7]. A review of the English literature on this subject identified only 27 reported cases over a 25 year period^[6].

The lower incidence of urethral injury in females is the result of three principle factors- the short length of urethra, the lack of exposure of the urethra to external forces, and the greater mobility of the female urethra^[8,9]. Injures may occur in the posterior or anterior urethra. Posterior urethral injures occur as a result of a sudden translocation of public bones and the avulsion of the puboprostatic ligaments causing urethral disruption, usually just above the urogenital diaphragm. Anterior urethral injures are usually iatrogenic or may be caused by straddle type injures where the bulbous urethra is crushed against the ischial rami^[10]. These mechanisms of injures are more applicable to male patients. Occasionally the urethra may also be directly injured by a bone fragment. Given the presence of bone protruding from the vagina this mechanism is a likely explanation in our female patient.

The presence of multiple pelvic fractures requires an increased index of suspicion for urethral injury. Regardless of gender the meatus should be examined for blood and if found evaluation of the lower urinary tract needs to be undertaken.

In male patients, the diagnostic test of choice to determine the presence of a urethral injury is a retrograde

uretherogram. Conversely, in females this study is limited due to difficulty distending the shorter urethra and urethroscopy may be the better diagnostic choice. Our patient was unusual in that the injury was identified by retrograde urethroscopy. However, urethroscopy was needed to determine the exact nature of this injury and facilitated treatment.

Treatment of anterior disruptions of the urethra where the urethral sphincter and urogenital diaphragm remain intact typically consists of urinary catheter placement over a guide-wire during urethroscopic guidance, followed by observation, catheterization for 10-14 days with or without placement of a suprapubic tube^[11]. Secondary reconstruction is often delayed for 6-12 weeks. An alternative approach in females is primary surgical repair which may limit the likelihood of urethral spincteric scaring and subsequent incontinence or stricture formation. The principle complications following urethral disruptions include urinary retention, urethral stricture, and potential urinary incontinence.

This patient sustained an open pelvic fracture associated with an anterior transection of urethra. While the incidence is relatively uncommon in females a high index of suspicion is needed in the setting of an open book pelvic fracture. While retrograde urethrography was utilized in this case it is frequently limited in females and urethroscopy may better define the injury and provide a method of non-operative repair.

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