



## Traumatic Female Urethral Injury: An Overlooked Entity

Yoram Mor MD<sup>1</sup>, Ilan Leibovitch MD<sup>1</sup>, Nir Sherr-Lurie MD<sup>2</sup>, Jacob Golomb MD<sup>1</sup>, Paul Jonas MD<sup>1</sup> and Jacob Ramon MD<sup>1</sup>

Departments of <sup>1</sup>Urology and <sup>2</sup>Orthopedics, Sheba Medical Center, Tel Hashomer, Israel

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Until the last decade, female urethral injury was barely mentioned in urologic textbooks and only scant information appeared in the literature. Awareness of this entity has increased tremendously, as reflected in the number of published reports. Still, many cases are probably overlooked upon presentation, probably resulting in increased morbidity and major complications in the trauma patient. We present our experience with this condition, to draw further attention of traumatologists and general surgeons to its existence.

### Patient Descriptions

#### Patient 1

An 8 year old girl was involved in a road accident as a pedestrian and sustained major injuries. Upon admission she was unconscious due to severe head trauma including intracerebral bleeding. In addition, she had a complicated fracture of the mandibular bone and a major perineal laceration. She underwent emergency explorative laparotomy, during which a diverting colostomy was established and a cystostomy tube was inserted. Evaluation of the perineal region under anesthesia revealed profound vaginal tears with disruption of the distal urethra, but a urethral catheter was easily retrogradely inserted. She was also found to have a rotationally unstable and vertically stable pelvic fracture with fractured posterior ileum and ramus pubis of the same side, which were classified as lateral compression grade II according to Young's classification. An indwelling urethral catheter was inserted. Upon removal

of the catheter 6 weeks later she was voiding normally and was continent. Examination 2 years later revealed severe distortion and narrowing of the introitus together with a slender hypospadiac urethral meatus, which were treated by dilatations. During a follow-up period of 8 years she remained symptom-free.

#### Patient 2

A 40 year old woman, involved in a road accident, presented with abdominal injury and urethrorrhagia, without any evidence of vaginal laceration. An 18F Foley catheter was easily inserted per urethra and drained clear urine, while distinct bleeding originated from the urethral meatus. Pelvic X-rays demonstrated an unstable pelvic fracture, which was classified as vertical shear type according to Young's classification. Computed tomography scan combined with cystography ruled out urine extravasation. On day 3 following injury she developed a spiking fever and became septic, together with progressive left upper thigh edema and copious periurethral discharge. A repeat CT scan demonstrated gas in the edematous soft tissues of the left upper thigh. She remained septic despite coverage with broad-spectrum antibiotics. Surgical exploration revealed a small rectal wall hematoma with minimal localized fecal spillage, combined with marked foul-smelling periurethral discharge that was increased by manual compression of the edematous thigh. Fasciotomy of the left thigh disclosed myonecrosis of the adductor muscles, extending towards the

perineum. She was managed by debridement of the wound, urinary diversion via suprapubic and urethral catheters and a diverting colostomy. Urethroscopy performed 1 month later was not diagnostic, while double balloon urethrography revealed a lateral tear in the distal urethra. Suprapubic and urethral catheters were inserted, and after 3 months, once the extravasation resolved, the catheters were removed. At follow-up 1 year after the accident the patient was symptom-free and fully continent.

#### Patient 3

A 7 year old girl was involved in a road accident as a pedestrian. On admission, bleeding from the perineum was noted. Pelvic X-rays and CT scan showed fractures of the left pubic rami, with slight anterior widening of the ipsilateral sacroiliac joint. Her injury was classified as anterior-posterior compression, grade II, according to Young. She was fully conscious and hemodynamically stable. Due to her injury she was examined under anesthesia, which revealed severe lacerations of the vagina and a complete disruption of the mid-urethra. The vaginal mucosa was sutured primarily, and the bladder was drained via both a suprapubic tube and a urethral catheter to facilitate spontaneous realignment. No further reconstruction was attempted at that time due to diffuse vaginal bleeding. She was treated conservatively with bed-rest and skin traction to the left leg for 3 weeks. Subsequent repeat pelvic examinations revealed a defect in the mid-

urethra, which gradually diminished in size but did not close completely. Eventually, the urethral catheter was removed, the suprapubic tube was clamped and she voided through a hypospadiac opening, but was fully continent. At follow-up 3 months later, she remained continent and has had no difficulties with micturition.

### Comment

The previously neglected issue of traumatic female urethral injuries was originally reported by Perry and Husmann in 1992 [1]. Their review of 130 female patients with pelvic fractures revealed coexisting urethral injuries in 4.6%. Similarly, Orkin's review [2] showed an incidence of 6% for these concomitant injuries. Given that pelvic fractures are more common in females, with a ratio of 1.5:1 [3], the prevalence of urethral injury among females might even exceed the reported figures for males. The increased incidence of female urethral injuries may be attributed to more awareness and better diagnostic techniques, as well as to the improved survival of severely injured patients [1]. According to Hemal et al. [4], urethral injury appears to be more common in girls than in women, with a ratio of 33:7, suggesting either better survival or increased vulnerability of the pelvic organs in the young population. As in our report, most injuries involve a pedestrian struck by a motor vehicle. The mechanism of injury may be either backward displacement of the pubic rami caused by transverse compressive forces, or upward displacement of one hemipelvis with respect to its counterpart. Trauma to the urethra may result in either partial or complete transection, or a longitudinal injury that may extend to the bladder neck.

However, more commonly, a urethral injury in females consists of a partial tear of the proximal anterior wall, while complete disruption is rare and is usually associated with severe vaginal lacerations [5]. Post-traumatic urinary incontinence may also be encountered, as the circular striated urethral sphincter surrounds the distal two-thirds of the urethra in a spindle-like fashion, with the highest urethral closure pressure at the middle third and thin segments towards the bladder neck and the distal end, being especially thinner at the posterior aspect adjacent to the vagina.

Female urethral injuries are probably often overlooked because, unlike in males, even severe ruptures tend to present with only minor voiding symptoms and catheterization is usually easy. In addition, a low index of suspicion and incomplete examination of the genitalia in trauma victims further complicate the diagnosis. Vaginal examination (preferably under anesthesia) should therefore be the mainstay of the routine workup in female patients presenting with pelvic fractures associated with voiding difficulties, hematuria, urethrorrhagia, vaginal bleeding or labial edema [5]. In doubtful cases the diagnostic reliability of urethrography is still controversial, and the use of urethroscopy is generally recommended [1]. The role of double balloon urethrography in the diagnosis of urethral trauma, which proved beneficial in one of our cases, is not discussed in the literature. The implication of a missed urethral tear may be life-threatening, since extravasation of infected urine (especially in association with concomitant rectal injury) may lead to cellulitis and progressive fasciitis, which was the case in one of our patients.

Since urethral injury is usually encoun-

tered among patients sustaining major trauma, the urologic management should begin subsequent to the initial resuscitation efforts. Recommendations regarding treatment are controversial, ranging from a conservative strategy based upon bladder drainage, through diversion via a suprapubic catheter and urethral realignment using a urethral catheter [3], to the more aggressive approach that promotes primary repair [4,5].

In conclusion, it is imperative that physicians be aware of the possibility of a coexistent urethral injury in female patients presenting with pelvic fractures and, depending on the clinical circumstances, perform the necessary examinations and imaging studies in order to establish the correct diagnosis.

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**Correspondence:** Dr. Y. Mor, Dept. of Urology, Sheba Medical Center, Tel Hashomer 52621, Israel.

Phone: (972-3) 530-2231

Fax: (972-3) 535-1892

email: yoram.mor@sheba.health.gov.il

## Capsule

### SARS and common viral infections

Louie et al. showed in California that molecular testing was useful in decreasing suspicion for severe acute respiratory syndrome (SARS), by detecting common respiratory pathogens (influenza A/B, human metapneumovirus, picornavirus, *Mycoplasma pneumoniae*, Chlamydia spp., parainfluenza virus, respiratory

syncytial virus, and adenovirus) in 23 (45%) of 51 patients with suspected SARS and 9 (47%) of 19 patients with probable SARS.

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