

Trauma and Reconstruction

Bladder Injury From Penetrating Trauma of the Inner Thigh

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ABSTRACT

This is a unique case of bladder injury from a penetrating upper leg wound. The patient's initial presentation did not suggest genitourinary injury, however the patient had a relatively late episode of gross hematuria that prompted further investigation. Based on findings of bladder laceration, the patient was managed conservatively and did well. To our knowledge an injury with this particular trajectory and mechanism has not been described previously in the literature. It stands as a reminder that genitourinary trauma can have many points of origin and that a high index of suspicion is necessary during evaluation of these patients.

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Case

A 57-year-old male presented to the emergency room after sustaining a penetrating stab wound to the right inner thigh from a thin knife reportedly 12-inches in length. The patient stated that he was walking up a staircase and his assailant stabbed him from below in the medial thigh, with the knife traveling in an upward trajectory.

The Trauma surgery team evaluated his leg wound, with a high-level of concern for occult injury to deeper structures including the major vessels in the groin. Both thorough physical examination and focused imaging of the lower extremity demonstrated no obvious injuries to deeper structures, so the wound was primarily repaired and with no other complaints, the patient was discharged home.

A few hours after discharge the patient returned to the emergency room with suprapubic abdominal pain and gross hematuria. The patient noted this was his first attempt at voiding after he was stabbed. He was found to be in urinary (clot) retention and was readmitted for evaluation by the Urology service.

The patient's bladder was manually cleared of gross hematuria through a catheter. Given the context and time-course of events after his injury, evaluation for a lower urinary tract injury was undertaken first. Cystourethrography was performed and showed no extravasation of contrast, disruption of contour, or any other finding suggestive of urethral or bladder injury. Computed

Tomography Urography was also performed, with a particularly high index of suspicion for occult, unrecognized injury to the lower ureters. This CT did not reveal any upper or lower urinary tract source of bleeding.

Finally, rigid cystoscopy was performed and demonstrated a linear area on the right lateral floor of the bladder where the integrity of the bladder mucosa was clearly disrupted. Directly opposite this wound was another puncture wound in the dome, following the knife trajectory.

Based on the size and location, mode and trajectory of the injury, it was evident that these areas were likely the sites of knife puncture and the source of gross hematuria. Assessment of the wound depth in the dome was not possible, but since no active bleeding was seen and no extravasation had been seen on cystography, the decision was made to manage this conservatively with an indwelling urinary catheter for 10–14 days to allow for complete healing of the injury (Figs. 1–3).

Discussion

Bladder injuries are typically classified as blunt or penetrating. The bladder sits in the bony pelvis, which protects it from injury. However, as the bladder fills, the dome rises into the lower abdomen making it progressively more susceptible to injury.¹ The bladder is retro- or extraperitoneal in nature. The bladder dome is lined by the visceral peritoneum and is the least supported portion; accordingly, this part is the most susceptible to injury.²

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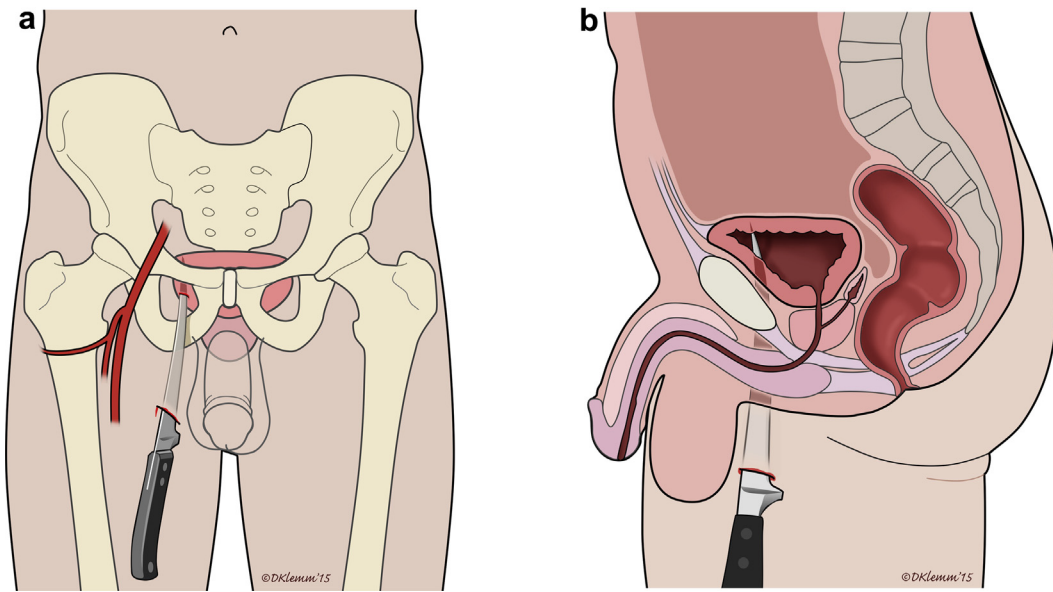


Figure 1. A/P & lateral depictions of likely trajectory of knife injury (a. Anterior view. b. sagittal view).

Compared to blunt bladder trauma, which accounts for most bladder ruptures, penetrating bladder trauma is relatively uncommon with percentages ranging from 14–49%.³ Penetrating bladder injuries are also most likely to be associated with abdominal gunshot wounds (87.3%).⁴ The most common entry points are via the anterior abdomen, rectum, and buttock. Therefore, penetrating bladder injuries via the inner thigh are practically unheard of.

Roughly 95% of injuries to the bladder present with gross hematuria,⁵ and in the rare occasion that this is absent, microscopic hematuria is still likely evident. Physical examination may also reveal suprapubic or lower abdominal pain and distention.

This case of bladder injury is unique because of the entry-point and trajectory of the stab wound causing a genitourinary insult. The time course is also peculiar, since the patient did not demonstrate any immediate evidence of the bladder injury, and was actually

discharged home before experiencing hematuria. Most penetrating bladder injuries involve an abdominal or pelvic entry-point, and are therefore more straightforward in presentation and clinical evaluation.

The patient's return with gross hematuria immediately raised the concern for a lower urinary tract injury, but interestingly initial non-invasive investigations including CT Urogram and cystourethrography failed to demonstrate any obvious explanation. Consequently, another unique feature of this injury was that the insult was initially severe enough to cause gross hematuria and clot retention, but limited enough to escape detection on imaging soon thereafter. This is unusual because cystography has a generally high accuracy rate of 85–100%.⁶

Clinicians should perform a retrograde cystourethrography in stable patients with gross hematuria and a mechanism of injury

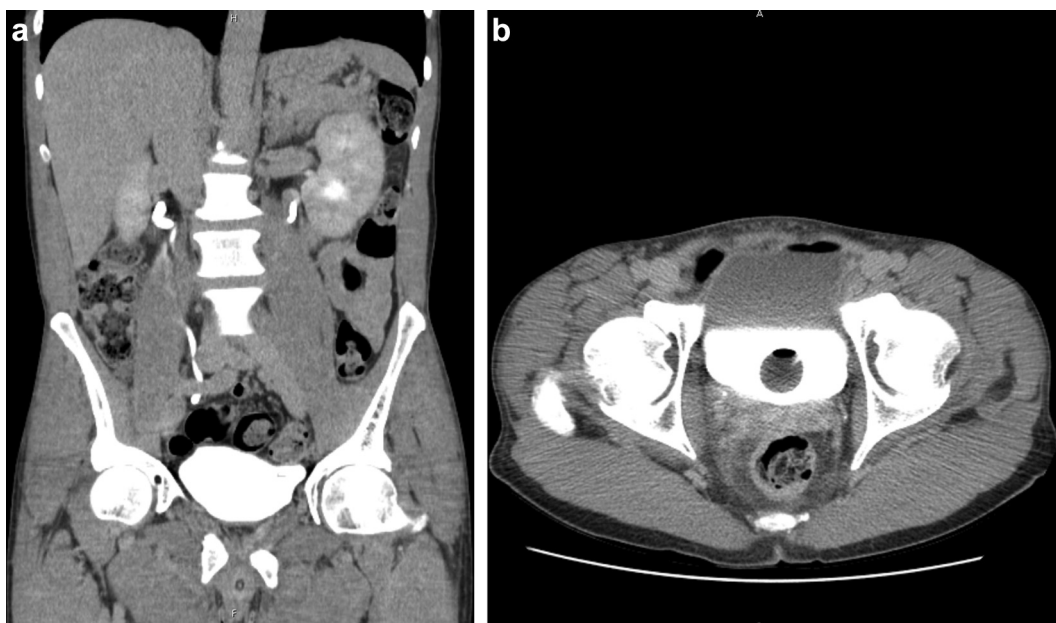


Figure 2. CT/IVP demonstrating no obvious injury to the bladder and ureters.

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