

Case Report

Isolated and Tangential Bladder Perforation in Gunshot Injury: A Case Report

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Abstract

Approximately 3.6% of abdominal gunshot injuries result in urinary bladder damage. However, damage to the nearby organs frequently goes along with bladder injuries brought on by a gunshot wound. One must expect two injury sites in a urinary bladder gunshot wound because failure to close one site may lead to severe complications. In the present study, the case of a 30-year-old male patient with an isolated bladder injury with a single perforation after being shot in the left iliac fossa is presented and discussed based on the literature.

Keywords: Urinary bladder; Perforation; Firearm injury; Tangential Bladder injury

Introduction

Abdominal gunshot injuries involving visceral damage most commonly affect the small intestine (60%), colon (41.6%), liver (29.3%), vascular structure (24.6%), stomach (17.3%), and kidney (17%) [1]. Insults to the abdominal organs in gunshot injuries are frequently concurrent with genitourinary system injuries. Due to detrimental consequences such as rectovesical fistulas and abscess development, it is crucial to rule out bowel injuries in cases of genitourinary trauma [2,3].

In a 50-case series involving gunshot injuries of the lower urinary tract system, Cinman et al. [4] reported that 72% of the patients involved only the bladder, 12% had both ureteric and bladder injuries, and 8% had only urethral injuries [4]. Bladder injuries result from blunt traumas 68%-86%, penetrating traumas 3%-14%, and iatrogenic causes 1%-2% of the time. Of these wounds, 8%-10% are mixed wounds, 15%-55% are intraperitoneal, and 45%-85% are extraperitoneal wounds [5]. 3.6% of abdominal gunshot wounds and 20% of penetrating hip wounds result in bladder trauma [5]. However, isolated urinary bladder injuries in abdominopelvic gunshot wounds are very rare, but the case we are describing here is extremely rare because no literature studies were found on it.

Case Presentation

A 30-year-old male patient was brought to the emergency department with a firearm injury to his abdomen. On presentation, he was vitally stable and oriented in time, place, and person. The bullet entrance wound was at the left iliac fossa; there was no exit wound and no active bleeding. The case had no comorbidities or past surgical history. On catheterization, gross hematuria was observed. A FAST

scan was done and was negative. The lab results were as follows (Table 1).

Frontal projection of an X-ray pelvis and X-ray abdomen with both hemidiaphragms showed dense radio-opaque shadow anterior to the pubic bone (Figure 1A) and no free gas (Figure 1B), respectively.

Table 1: The lab results were as follows.

TLC	12,000 U/L	ALP	76 U/L
Hb	12.8 gm/dL	T.Bilirubin	0.4 mg/dL
Platelets	220 × 10 ³ U/L	S.creat	0.66 mg/dL
ALT	30 U/L	Urea	19 mg/dL

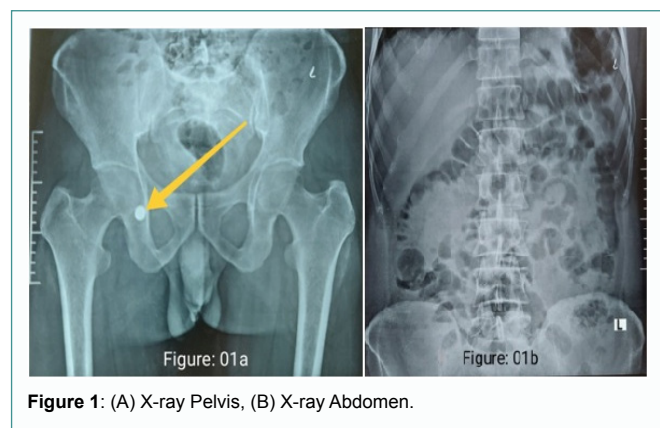


Figure 1: (A) X-ray Pelvis, (B) X-ray Abdomen.

A FAST scan repeated after 2 hours was negative. On the next day, a U/S scan was done, which showed minimal pelvic free fluid. Ascitic Fluid R/E was done, and the result was (Table 2).

On the same day the catheter accidentally got out, this was followed by a spontaneous watery, open-tap-like discharge from the wound site (Figure 2).

CT abdomen (lower) and pelvis done (Figure 3A and B), which showed moderate fluid, exaggerated thickening of soft tissue stranding, and multiple air locules in the left anterolateral abdominopelvic wall. Comminuted fracture of the posterior column of the right acetabulum. A linear, hyperdense, metallic foreign body was noted in the subcutaneous tissue of the right mid gluteal region (Figure 3B, yellow arrow). The urinary bladder was suboptimally filled and

Citation: Ahmad J, Raza AA, Abdullah A, Khan F, Rafi H. Isolated and Tangential Bladder Perforation in Gunshot Injury: A Case Report. J Surg Surgic Case Rep. 2023;4(2):1035.

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Publisher Name: Medtext Publications LLC

Manuscript compiled: Jun 17th, 2023

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showed generalized thickening of its wall up to 6 mm (Figure 3C).

Exploratory laparotomy was done. All the viscera were found normal except for a 2 cm × 3 cm perforation at the posterosuperior surface of the urinary bladder, which was found by pushing 500 ml of normal saline through the Foley's catheter to the bladder and clamping the catheter. There was no second perforation; it was a tangential insult by the bullet on its trajectory from the left to the right side of the body within. The bladder was repaired in two layers. The patient was being clinically monitored as part of a regular follow-up plan, and no abnormal findings were found.

Table 2: The lab results were as follows.

Physical Examination		Microscopic examination	
Volume	10ml	Total WBC count	1200/cm
Color	Cloudy	Total RBC count	Nil/cm
Deposit/clot	+		
Chemical Examination	Results	Differential count	Results
Protein	1.8gm/dL	Neutrophils	80%
LDH	1465 U/L	Lymphocytes	20%
Zn Stain		No AFB seen	
Gram Stain		No Microorganism seen	



Figure 2: Spontaneous watery, open-tap-like discharge from the wound site.

Discussion

The patient with gunshot wound having urinary tract injury may present with findings such as suprapubic pain and tenderness, dysuria, hematuria, and blood in the urethral meatus in history. Physical examinations should pay close attention to the evaluation of entrance and exit gunshot wounds, looking for ecchymoses all over the body, the presence of blood in the urethral meatus, and hematuria [5].

Diagnosis is made based on radiological investigations, i.e., Computed Tomography (CT), Urography, and CT cystography are the radiological investigations of choice [5].

The bladder is most frequently involved in lower urinary tract penetration injuries. Because failure to seal one injury site might result in problems, two injury sites should be expected during the examination for gunshot wounds to the bladder. Lower urinary tract gunshot wounds frequently come with concurrent bowel damage and buttock penetration [4]. But in our case, there was only an entry wound and no exit wound. And an isolated bladder injury having only

one perforation at the posterosuperior surface.

In gunshot wounds, exploration and repair must be the primary strategies. During this surgical procedure, a vertical lower middle incision is made, giving a clear view of the abdomen; if necessary, it can be extended. Cleaning necrotic tissues and removing extraneous objects are required. Additionally, the distal ureters and bladder wall need to be examined. A midline cystostomy should be used to access the bladder and examine the ureteral orifices in detail [6,7].

Intraperitoneal ruptures that were either late-diagnosed or undetected could potentially result in extravasation of the urine, secondary ileus, peritonitis, abdominal distension, and sepsis. Consequently, it is very important to use a multidisciplinary approach for treating bladder injuries caused by gunshot wounds and to diagnose and perform surgery as early as possible. On the other side, individuals who have had a bladder perforation may experience problems such as urinary tract infections, symptoms of the lower urinary system, and the formation of a fistula as a result of surgical intervention. The frequency of these negative outcomes is highly correlated with the site and depth of the injury. However, the surgical team's degree of expertise, experience, and ability all play a significant role in these rates [5,8].

Conclusion

Routinely done investigations like Ultrasound, X-Ray Chest, Abdomen, and Pelvis, and Computed Tomography Scan can miss isolated urinary bladder injuries. Therefore, such cases should be thoroughly investigated to detect these injuries.

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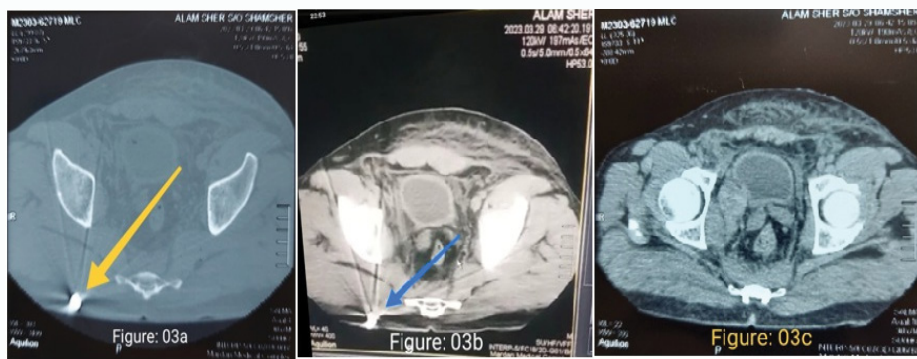


Figure 3: CT abdomen (lower) and pelvis done (A, B) which showed moderate fluid, exaggerated thickening of soft tissue stranding, and multiple air locules in the left anterolateral abdominopelvic wall. (C) The urinary bladder was suboptimally filled and showed generalized thickening of its wall up to 6 mm.