ISOLATED BLADDER RUPTURE IN AN ELDERLY PATIENT AFTER BLUNT TRAUMA. CASE REPORT AND REVIEW

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ABSTRACT

A 74-year-old man presented to the hospital after having a mechanical fall at home on his left side of the body. On arrival he was stable, and investigation revealed fractured left humerus, and he was admitted for observation and pain management. Two days later he started to have severe lower abdominal pain and acute kidney injury. Urinary catheter inserted and about 2 liters of bloody urine emptied, and Abdominopelvic CT scan requested which showed massive fluid in the retroperitoneal area, subsequent CT Cystogram confirmed perforation of the bladder on the left lateral wall. The patient was hemodynamically stable and kept in a high intensive care unit for close observation, and he improved dramatically, and follow-up scan showed healing of perforated bladder. Bladder rupture is not a standard presentation after blunt trauma but should be kept in mind when dealing with elderly patients with pre-existing urinary retention or other medical comorbidities.

KEYWORDS: Bladder rupture, Urinary Retention, CT Cystogram, Uroretroperitoneum.

Introduction

The empty bladder is entirely situated deep within the pelvic cavity and is protected from external trauma by the bony framework of the pelvic girdle. When distended, it domes up into the abdominal cavity and is more prone to trauma-related injuries [1]. Bladder injuries can be grouped into iatrogenic (the result of surgical complication), spontaneous (preexisting bladder disease or previous urologic surgery) or traumatic (blunt or penetrating) [2]. Traumatic injuries are secondary to either penetrating or blunt accident. Most blunt traumatic injuries of the bladder are the result of motor vehicle accidents; but falls, assault, blow to the lower abdomen or crush injuries can cause significant damage to the urinary bladder. It is estimated that 80% – 90% of all the patients who present with bladder injury secondary to blunt trauma have significant non-urological injuries [3], with pelvic fractures being most common [4]. A full bladder is more vulnerable to rupture and sudden force applied to it may result in a rapid increase in intravesical pressures and lead to rupture without pelvic fracture. Bladder rupture can present with hematuria, lower abdominal pain or urinary retention and CT cystography is the modality of choice for diagnosis.

Case report

Detailed here is a 74-year-old male who presented to the emergency department following a mechanical fall at home. On further history it was alleged, he lost his footing over the sill of a sliding door and landed heavily on his left side onto the tiled flooring. There was apparent head trauma, however, no reported loss of consciousness.

Relevant past medical history includes COPD, ischemic heart disease (CABG) and atrial fibrillation for which he was on As-
pirin. On initial assessment, he was alert, cooperative and vital signs were in normal range. Physical examination revealed tenderness of the proximal part of the left humerus with reduction of the active and passive range of motion of the left shoulder. Rest of the examination including abdomen was unremarkable. Basic Laboratory tests were satisfactory, and urine dipstick did not show the presence of erythrocytes or leucocytes in it. Head CT scan along with left shoulder x-ray requested and CT head was normal but the shoulder x-ray revealed a fracture of surgical neck of the left humerus. Arm sling applied and the patient was admitted for observation and conservative management.

Two days later the patient developed severe abdominal pain with tenderness in the suprapubic area. He was not complaining of nausea or vomiting and had no urinary or gastrointestinal symptoms. Patient’s vital signs were in normal range, and the blood tests showed normal FBC but significant rise in serum creatinine level from 70 umol/L to 300 umol/L. Abdominopelvic CT scan ordered, and a massive retroperitoneal fluid with a distended bladder was found [Figure 1]. The possible differential diagnoses were uro-retroperitoneum secondary to bladder rupture or hemo-retroperitoneum.

Indwelling catheter inserted and 2 liters of bloody dark urine emptied from the bladder. Patient’s clinical picture was more for having urine in the retroperitoneal area rather than blood as he was hemodynamically stable and there was no drop in his hemoglobin level. Unfortunately, CT angiogram could not be performed because of his acute kidney injury and to clarify the diagnosis, CT cystogram requested and was done one day later which confirmed perforation of the bladder on the left lateral wall with extravasated retroperitoneal and prevesical urine [Figure 2,3]. The Patient was managed conservatively with close observation in the High Dependency Unit.

Fig. 1. Extensive retroperitoneal fluid in the Abdominopelvic CT Scan.

Fig. 2. CT Cystogram confirms bladder perforation in the left lateral wall.

Fig. 3. CT Cystogram confirms bladder perforation in the left lateral wall in the coronal view.
Outcome and follow-up:
Over the next few days, the patient improved dramatically with the kidney functions returning to normal range, and subsequent CT cystogram confirmed that the perforated spot on the bladder wall has sealed off. Two weeks later, IDC was removed, and after succeeding trial of the void the patient was discharged home with a plan of an outpatient cystoscopy. (This was canceled later due to anesthetist risks).

Discussion
Isolated perforation of the bladder wall due to a fall is uncommon and more frequently can be seen secondary injury following blunt or penetrating trauma to the abdomen. Urinary bladder is protected on its inferior surface by sitting on the prostate gland and attachment of puboprostatic ligament, on the anterior surface it is anchored to the anterior abdominal (umbilicus) by urachus remnant, but on the posterosuperior surface it is protected by merely intestinal loops, and it is the weakest surface which is also the usual site of perforation [5]. Impairment in the elasticity of the bladder makes it susceptible to rupture, and over-distention is the commonest cause for that. Usually, there are other co-existing factors such as diverticulum, fibrosis, ulceration, inflammation, or malignancy in a ruptured bladder [6]. In recent years, several case reports in alcohol intoxication-induced spontaneous bladder rupture have been noted in the literature [7]. This type of rupture is mainly caused by over-distended bladder with thin wall secondary to a large volume of urine as the result of the diuretic effect of alcohol and also impaired sensorium of the intoxicated person who may not feel to void [8].

Interestingly, our patient did not have any underlying urogenital conditions (i.e. BPH, urinary retention, diabetes) and retrospective review of his scans showed an entire normal bladder anatomy and functionality before the incident, but there is chance of having a full bladder at the time of impact as the patient had not urinated for several hours on that day.

The accuracy of abdominopelvic non-contrast CT scan in detecting bladder rupture is 60.6% compared to retrograde cystogram, which is 95.9% [9]. However, CT scan is the mode of choice because of being less invasive compared to cystogram and is commonly used to exclude other injuries [10]. Our patient had a massive fluid in the retroperitoneal which was obvious on the non-contrast CT scan and followed up cystogram confirmed rupture of the bladder.

According to American Association for The Surgery of Trauma, bladder injuries can be classified into 5 grades: Grade I; Contusion, intramural hematoma or partial thickness laceration, Grade II; Extraproitoneal wall laceration <2cm, Grade III; Extraperitoneal (≥2cm) or intraperitoneal (<2cm) bladder wall laceration, Grade IV; Intraperitoneal bladder wall laceration ≥2cm, Grade V; Intraperitoneal or extraperitoneal bladder wall laceration extending into the bladder neck or ureteral orifice (trigone). Minor uncomplicated extraperitoneal bladder ruptures can be managed conservatively with urethral catheter drainage alone, otherwise indications for urgent surgical interventions are: intraperitoneal bladder injury from external trauma, penetrating or iatrogenic neurologic injury, inadequate bladder drainage or clots in urine, bladder neck injury, rectal or vaginal injury, open pelvic fracture, pelvic fracture requiring open reduction and internal fixation, selected stable patients undergoing laparotomy for other reasons, or bone fragments projecting into the bladder [11]. The patient presented in this case had extraperitoneal bladder rupture with fluid in the retroperitoneal area and managed with IDC drainage and conservative management.

Conclusion
Perforation of bladder must be included as one of the differential diagnosis in patients who present with abdominal pain after trauma especially in elderly ones with pre-existing urological or metabolic conditions like diabetes or prostate hypertrophy. It can have a delayed onset and a few days after the incidence, signs, and symptoms present. The increase in kidney function tests and the presence of micro or macrohematuria are red flag signs for vesical perforation. With an appropriate imaging, diagnosis can be established after stabilizing the patient. It should be a bear in mind that, not all of the bladder ruptures need surgical intervention, and conservative management would be beneficial in many circumstances when considering patient’s clinical condition and also the grade of injury.

Authors’ Statements
Competing Interests
Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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