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Case Report

An uncommon case of intraperitoneal urinary bladder rupture in an adult with pelvic bone fracture

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ABSTRACT

Injury of urinary bladder can occur due to blunt, penetrating, or iatrogenic trauma. Here, author present an uncommon case of Intraperitoneal bladder rupture in an adult patient with associated pelvic bone fracture. Following a fall from his house, a 40 years old male patient presented with haematuria and abdominal pain. CT scan of abdomen revealed Intraperitoneal bladder rupture with pelvic bone fracture. Intraoperative findings revealed intraperitoneal rupture of bladder with a defect in dome region. It was repaired with Vicryl 2-0 suture. So, a high degree of suspicion of intraperitoneal bladder rupture should be kept in mind even though it has associated pelvic bone fracture in an adult patient.

Keywords: CT cystography, Intraperitoneal bladder rupture, Pelvic bone fracture

INTRODUCTION

Injury of urinary bladder can occur due to blunt, penetrating, or iatrogenic trauma. The susceptibility of the bladder to injury and rupture varies with its degree of filling at the time of the trauma; a collapsed or nearly empty bladder is much less prone to injury than is a distended bladder. Bladder injuries account for 1.5% of patients with blunt trauma abdomen. The most common cause is road-traffic accidents (90%). Bladder injuries are usually suspected when there is an associated pelvic bone fracture. Extra peritoneal ruptures are more common than intraperitoneal ruptures.[1] Operative management is the usual modality of treatment for intraperitoneal bladder rupture while the extraperitoneal injuries can be managed conservatively.[2,3]

CASE REPORT

A 40 years old male patient presented with a h/o fall from second floor of his house. He complained of pain in left elbow, wrist and hip joint. There was no loss of consciousness and no h/o vomiting following fall. He complained of haematuria and abdominal pain. His vitals were stable.

On focussed assessment with sonography for trauma (fast) scan, it was fast positive (free fluid with internal echoes was seen in the pelvis) and he underwent contrast enhanced computed tomography of abdomen.

Contrast enhanced computed tomography of abdomen revealed extravasation of contrast into peritoneal cavity through a defect in dome region and it was seen further extending through right inguinal region into scrotal sac through right inguinal hernia and it was diagnosed as Intraperitoneal bladder rupture. It was associated with left pubic rami and left acetabulum fracture with anterior hip dislocation along with fracture of left iliac blade. Also, there was splenic laceration. He was then taken for surgery and intraoperative finding revealed intraperitoneal rupture of bladder with a defect in dome

region measuring 7x2cm. It was repaired with Vicryl 2-0 suture. Post-operative, patient is stable.

Figure 1: A defect in dome region of the bladder with extravasation of contrast from urinary bladder into peritoneal cavity (arrow) with foley's bulb in-situ.

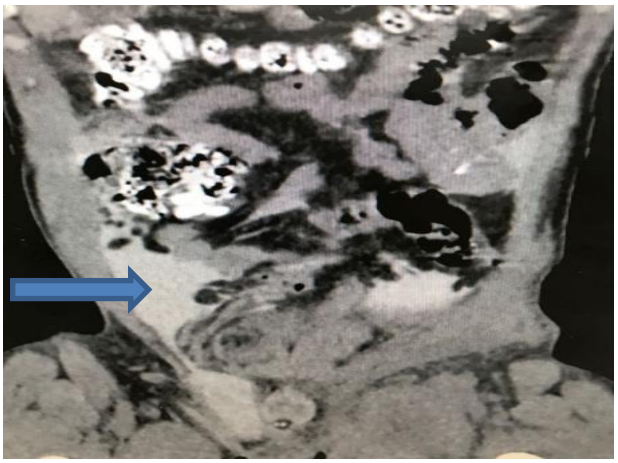

Figure 2: Contrast in the peritoneal cavity (arrow).

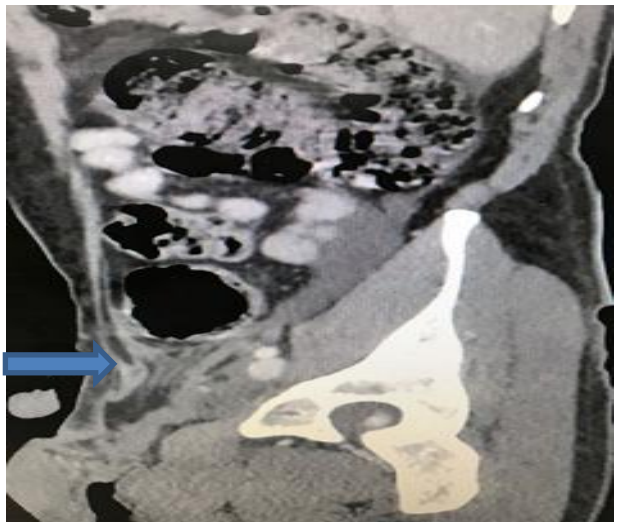

Figure 3: Defect (hernia) in right inguinal region (arrow).

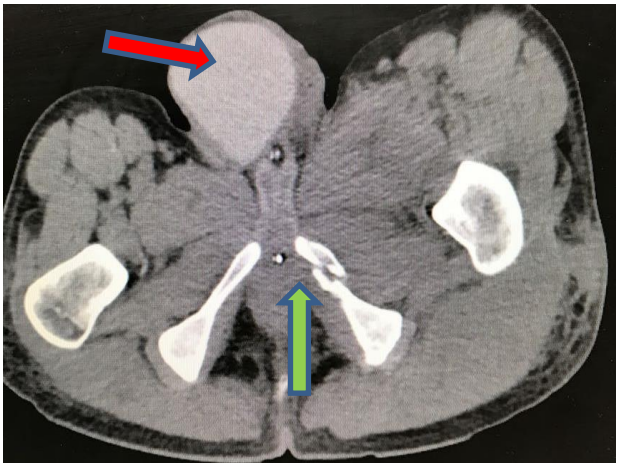

Figure 4: Contrast in the right scrotal sac (pink arrow) with fracture of left ischiopubic ramus (green arrow).

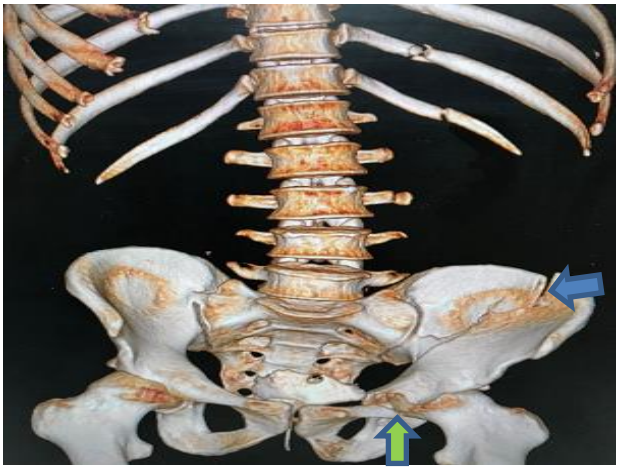

Figure 5: Fracture of left iliac blade (blue arrow) with Fracture of left ischiopubic rami and left acetabulum (green arrow).

DISCUSSION

Urinary bladder rupture is not so common, and it is usually a life-threatening event.

Bladder injuries/ruptures may be divided into two groups based on whether they are traumatic or spontaneous in origin. The majority of bladder injuries are because of trauma and these are further subcategorized based on whether the trauma was blunt, penetrating, or iatrogenic.

Blunt and penetrating trauma to the bladder are commonly seen in cases of pelvic bone fracture or gunshot injury to the pelvis.

Computed tomography (CT) and CT cystography are the imaging modalities of choice for bladder injuries. The advantage of CT over conventional cystography is that, author can review multiplanar reformatted images, which

are helpful when bladder injury is not suspected and a cystographic study is not performed.

The clues that are seen at CT without the instillation of contrast solution into the bladder include unusual fluid and gas collections, an abnormal location of a Foley's catheter bulb, and a defect in an enhancing bladder wall.

Extraperitoneal bladder ruptures usually constitute 80%-90% of all bladder ruptures. Most extraperitoneal ruptures are associated with pelvic bone fractures that cause perforation of the bladder wall.

Intraperitoneal bladder ruptures constitute 10%-20% of bladder injuries. This occurs at the dome of the distended bladder, which is the only part that is covered by peritoneum.[4]

The empty bladder is entirely situated deep within the pelvic cavity and is protected from external trauma by the bones of the pelvic girdle. When distended, it comes up into the abdominal cavity and is more prone to trauma.

A full bladder is more prone to rupture and a sudden force applied to it may result in a rapid increase in intravesical pressures and lead to rupture without pelvic bone fracture.

In recent years, several case reports in alcohol intoxication-induced spontaneous bladder rupture have been noted in the literature.[5] This type of rupture is 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 the urgency to void.[6]

The mechanism of intraperitoneal rupture is because of sudden increase in intra-vesical pressure when the bladder is full. This leads to rupture of the dome as its muscles fibers are widely separated and so- not well supported. The dome region has least resistance to sudden change in the intra-vesical pressure.[7] A pressure above 300cm of water causes the bladder to rupture.8

Signs of bladder injury are non-specific. Suprapubic tenderness is usually present along with hematuria. The urge to void the urine may be absent or normal.

Injury of the bladder following trauma is classified as follows.

- Type I: Bladder contusion
- Type II: Intraperitoneal rupture
- Type III: Interstitial bladder injury
- Type IV: Extraperitoneal rupture (simple and complex extraperitoneal rupture)
- Type V: Combined bladder injury

In simple extraperitoneal rupture, contrast medium extravasation is limited to the pelvic extraperitoneal space and with the resultant collection of blood, urine and contrast solution forming the classic "molar-tooth" appearance at CT cystography.

In complex extraperitoneal rupture, the contrast extravasation extends beyond the perivesical apace to the thigh, scrotum, penis or perineum.

In intraperitoneal rupture, contrast medium is seen in the paracolic gutters and outlining the abdominal viscera and loops of the small bowel.

CONCLUSION

Even though pelvic bone fracture is usually associated with an extraperitoneal bladder rupture and intraperitoneal bladder rupture usually occurs in children, sometimes intraperitoneal urinary bladder rupture occurs in an adult with pelvic bone fracture as seen in the case which needs to be kept in mind.

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