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Isolated intraperitoneal urinary bladder rupture following blunt trauma abdomen: a case study

Parampreet Singh Sandhu Param [1]*, Amandeep Singh [1], Ashutosh Talwar [1], Haramritpal Kaur [1], Robinpreet Kaur [1], Rupali Sehgal [1], Rajvir Kaur [2]

[1] Department of General Surgery, Guru Gobind Singh Medical College and Hospital Faridkot, Punjab, India

[2] Department of Anesthesiology, Guru Gobind Singh Medical College and Hospital Faridkot, Punjab, India

Abstract

Introduction: Urinary bladder injuries present in emergencies in the set up of road traffic accidents with blunt trauma to the abdomen. Bladder injury can be extraperitoneal, intraperitoneal, or mixed. Intraperitoneal bladder ruptures comprise 15% of all bladder injuries. The most common feature of bladder rupture is hematuria, which can be either microscopic or gross. We hereby present a case of isolated urinary bladder intraperitoneal rupture following a roadside accident due to its rarity.

Case presentation: The 29-year-old male was brought to emergency with an alleged history of Roadside accidents with a distended abdomen. Hematuria is present on Foley's catheterization. X-ray of the pelvis was normal. Contrast-enhanced computerized tomography whole abdomen showed bladder rupture. The patient was taken up for exploratory laparotomy and bladder repair. The postoperative period was uneventful.

Discussion: In blunt abdominal trauma, up to 90% of bladder injuries are often associated with pelvic fractures. Isolated traumatic bladder rupture is rare. In intraperitoneal bladder rupture, urine gets collected in the peritoneal cavity. Intraperitoneal bladder rupture requires exploratory laparotomy and the site of rupture is treated by suturing the bladder in two layers with absorbable sutures. Postoperative care is focused on preventing urinary catheter-associated infections.

Conclusion: This case report highlights the rare occurrence of isolated bladder rupture in cases of Road traffic accidents. Our patient recovered uneventfully after exploratory laparotomy and surgical repair.

Keywords: Urinary bladder, Rupture, Extraperitoneal, Intraperitoneal, Trauma

Corresponding Authors: Parampreet Singh Sandhu Param

✉ Email: param18192@gmail.com

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Introduction

Urinary bladder injuries present in an emergency in the set up of road traffic accidents with blunt trauma to the abdomen. Relatively uncommon these days, patients with bladder injury comprise 0.36% of all blunt trauma abdomen patients (1). Bladder injuries occur as a result of a direct blow to the distended bladder. These patients have classical symptoms of suprapubic pain with gross hematuria. Signs of peritonism like tenderness, guarding, and rigidity can be seen on examination in a few cases (2).

Bladder injury can be extraperitoneal, intraperitoneal, or mixed. Extraperitoneal bladder injury is most common and is associated with pelvic fracture and occurs as a result of decelerating injuries. These mostly involve the anterolateral wall, trigone, or neck of the urinary bladder. In these cases, urine extravasation is extraperitoneal and confined around the bladder. Thus, FAST (Focused assessment with sonography for trauma) stays negative in these injuries. Most of these cases can be managed conservatively barring a few complex extraperitoneal bladder ruptures (3).

Intraperitoneal bladder ruptures comprise 15% of all bladder injuries. It is more prone to occur at the dome of the bladder since this wall is mobile. Urine extravasates into the abdomen and so, FAST is positive. Surgical repair of these injuries is crucial with 100% success rate in most cases (4,5).

We present a rare case of isolated urinary bladder intraperitoneal rupture following a roadside accident due to its rarity.

Case presentation

A 29-year-old male was brought to the emergency department, GGSMCH, Faridkot after a roadside accident in which a patient was driving his bike and got hit by a tractor. As narrated by the patient himself, just after the collision, he lost his balance and fell, hitting his lower abdomen over the bike's handle. He also states that he felt the urge to void urine before the accident but neglected it. The patient did not experience any head trauma. He was brought in an ambulance to the emergency department. The patient had tachycardia of 110 beats per minute with a normal blood pressure of 110/76 mm of mercury. GCS was 15/15.

On examination, the abdomen was distended and guarding was present in the lower abdomen. No blood was present at the tip of the meatus. Upon catheterization of the urinary bladder, blood-mixed urine was drained. The patient was resuscitated with IV fluids, IV antibiotics, IV analgesics, and hemostatic agents. He had no known comorbidities.

X-Ray pelvis ruled out any pelvic fracture as depicted in Figure 1. The patient's blood workup revealed hemoglobin: 17, TLC counts: of 11.3 and Serum Creatinine of 1.3.

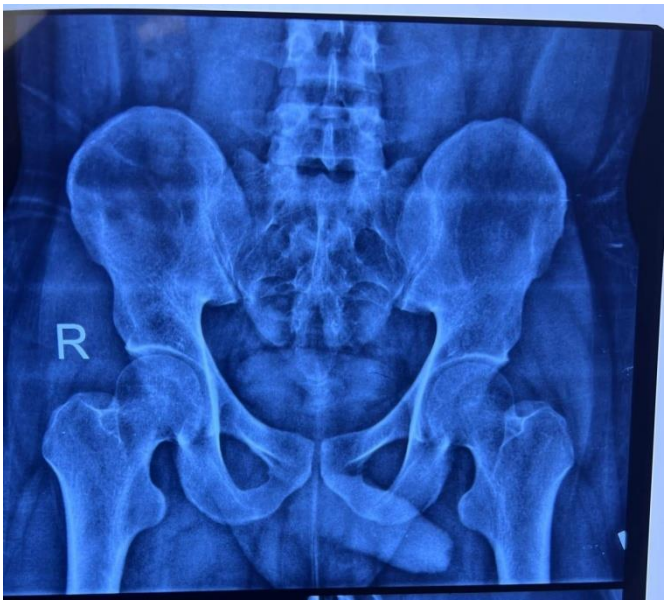

Figure 1. X-ray pelvis showing no obvious bony injury.

Ultrasonography whole abdomen revealed free fluid with internal echoes in the pelvis. CECT abdomen(being the investigation of choice for blunt trauma abdomen) revealed gross spillage of dye from the bladder into the peritoneum suggestive of intraperitoneal bladder rupture as depicted in figure 2 (arrowhead). No other visceral injury was seen. Gross free fluid was noted in the peritoneum.

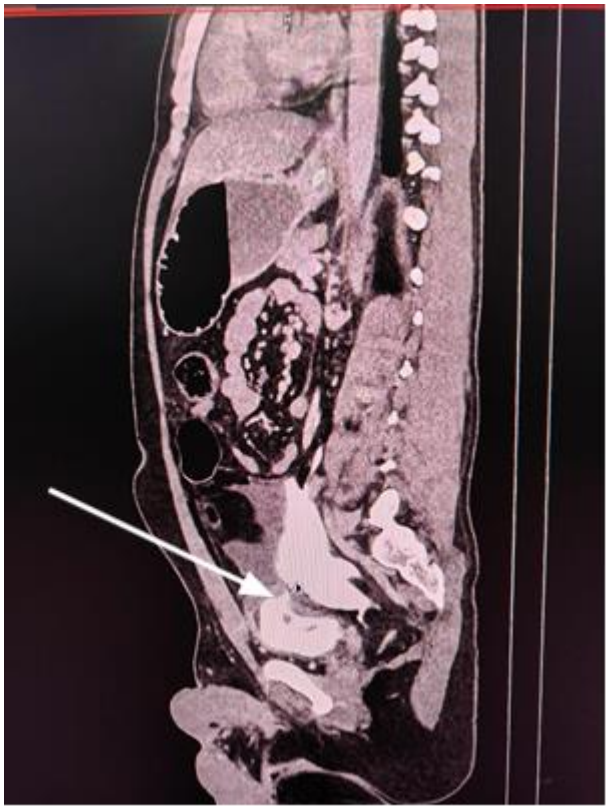

Figure 2. CECT whole abdomen with pelvis showing contrast extravasation from the bladder into the peritoneal cavity.

The patient was taken up for exploratory laparotomy and the following findings were reported: 1L blood mixed urine along with blood clots drained from the peritoneal cavity; intraperitoneal urinary bladder rupture full thickness through the dome of the urinary bladder(as depicted in figure 3; All the solid and hollow viscera were found to be normal.

Figure 3. Intraoperative photograph showing ruptured bladder dome.

The bladder was repaired in a double layer using Vicryl 3-0 round body sutures. The abdomen was closed in layers. Pelvic drain left in situ. Three A suprapubic catheter was left in situ.

The patient was monitored closely postoperatively. Vital monitoring along with daily urine output charting in the suprapubic catheter and the per urethral catheter was done. The patient's post-operative period remained uneventful with no distension or any other fresh complaints. The patient was discharged in satisfactory condition after 7 days with the suprapubic catheter in situ. The patient was followed up for 6 weeks. The suprapubic catheter was removed on POD 21 following the cystourethrogram, which was found to be normal. The patient had a follow up for 4 weeks with no fresh complaints.

Discussion

bladder; or high-energy abdominal trauma, which can lead to pelvic fracture and bladder injuries; or penetrating and iatrogenic injuries, frequently with a motor vehicle accident (MVA) (6).

In blunt abdominal trauma, up to 90% of bladder injuries are often associated with pelvic fractures. Isolated traumatic bladder rupture is rare, but extraperitoneal rupture is frequent, accounting for 80% of the cases (7). A blow to the lower abdomen in a patient with a distended bladder may result in the rupture of the weakest part of the bladder due to the increased intravesical pressure. The bladder dome is in contact with the peritoneal surface and is a weak point that is susceptible to rupture.

The most common feature of bladder rupture is hematuria, either microscopic or gross hematuria and intraperitoneal bladder rupture results in urine getting collected in the peritoneal cavity resulting in the signs of peritonitis. Hematuria is absent in 15% of cases of intraperitoneal bladder rupture. Delayed presentation is seen in some cases with non-passage of urine and lower abdominal pain. Intraperitoneal rupture of the bladder leads to urinary ascites. This leads to an increase in the levels of serum urea, creatinine and Potassium with the decrease in serum sodium concentration.

Ultrasonography is a very widespread diagnostic method, but has a limited role. The investigation of choice is CECT Whole abdomen with pelvis.

Non-operative management can occasionally be applied for extraperitoneal bladder rupture but intraperitoneal rupture of the bladder must be explored surgically Intraperitoneal bladder rupture requires exploratory laparotomy and the site of rupture is treated by suturing the bladder in two layers with absorbable suture. Permanent sutures represent a potential nidus for calcium deposition and future bladder stone formation (8).

In our patient abdomen was distended with generalized tenderness and guarding along with gross hematuria was present on catheterization.CECT's whole abdomen revealed rupture of the bladder dome along with extravasation of contrast into the peritoneal cavity. So, the patient was immediately taken up for exploratory laparotomy, and bladder repair was done.

Conclusion

This case report highlights the rare occurrence of isolated bladder rupture in cases of Road traffic accidents. Careful attitude and thorough knowledge about the mechanism of injury is the cornerstone for proper diagnosis and early management of the patient.

Author contribution

PSSP, **AS**, and **AT** wrote the manuscript. RoK and RS prepared the figures. HK and **RaK** proofread.

Patients consent

The patient’s informed consent was taken for academic purposes.

Conflict of interest

There are no Conflicts of interest.

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