



SPONTANEOUS RUPTURE OF URINARY BLADDER (SRUB) MASQUERADING AS SUB-ACUTE INTESTINAL OBSTRUCTION ON INITIAL CT – A RARE CASE REPORT

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ABSTRACT Spontaneous Rupture of Urinary Bladder (SRUB) is an atypical case, presenting to the emergency as an acute abdomen with non-specific symptoms, leading to high rates of misdiagnosis and mortality. A connection to urinary obstruction or bladder wall weakness is often elicited. We present a case of a 67-year-old female with long-standing urinary catheterisation, who presented with abdominal pain, signs of peritonitis and acute renal failure, misdiagnosed as sub-acute intestinal obstruction on initial plain CT scan, due to inflammatory ileal wall thickening and luminal narrowing in pre-vesical region, with dilated proximal small bowel loops. Subsequent contrast-enhanced CT scan with CT cystography revealed loculated peritoneal collections, with positive contrast extending out of the lumen at the dome of the urinary bladder. Patient was managed conservatively with antibiotics and bladder catheterisation. Early diagnosis and management of SRUB are crucial for an uneventful recovery.

KEYWORDS : spontaneous bladder rupture, urinary peritonitis

INTRODUCTION:

Spontaneous rupture of urinary bladder (SRUB) is an uncommon event with subtle presentations. The incidence of spontaneous bladder rupture has been reported to be 1:126000; 79% of all cases are reported in men, with an overall mortality of 47% (1). Only few case series of SRUB are found in the literature. Unfortunately, the diagnosis and treatment of SRUB are often delayed and missed.

We present an unusual case of urinary bladder rupture in a bed-ridden patient with long-standing urinary catheter and chronic cystitis, who presented with signs of peritonitis, but was initially misdiagnosed as sub-acute intestinal obstruction on imaging.

CASE REPORT:

A 67-year-old female patient presented to the Emergency Department with acute abdominal pain. She was chronically bedridden due to fracture neck of right femur, with long-standing urinary catheterization. On examination, she had abdominal guarding and rigidity, with absent bowel sounds, raising the suspicion of peritonitis.

An urgent ultrasound of the abdomen showed moderate free fluid in the abdomen and pelvis, with fine mobile internal echoes. Erect chest radiograph was not feasible; hence, emergency plain CT scan of the abdomen was done to rule out pneumo-peritoneum (suspecting bowel perforation). The CT scan revealed dilated small bowel loops with air-fluid levels within, with smooth transition in the ileum and suspicious ileal wall thickening in the pelvis, anterior to the urinary bladder. It also revealed an empty urinary bladder (with Foley's bulb within), with diffuse bladder wall thickening and peri-vesical inflammation, suggestive of chronic cystitis. Mild bilateral hydro-ureteronephrosis was also seen.

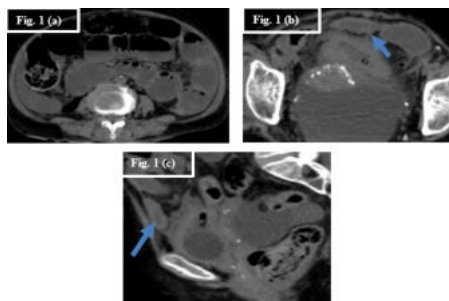


Fig. 1. Emergency plain CT showing dilated small bowel loops with air-fluid levels within (1a), with transition at site of inflammatory bowel wall thickening in pre-vesical region – blue arrows (1 b and c)

Blood investigations showed significantly raised serum urea and creatinine levels (urea 60 mg/dL, creatinine 2.6 mg/dL), hyponatremia (120 mmol/L), hyperkalemia (5.9 mmol/L) and a markedly raised total WBC count of 71,000/ml. Aspirate from a diagnostic peritoneal tap revealed increased leucocytes (>100/ml) with neutrophilic predominance.

Thus, a diagnosis of spontaneous bacterial peritonitis with urinary tract infection and acute kidney injury (AKI) was made. The urinary catheter, being suspected as source of infection, was removed; patient was admitted and started on intravenous fluids and antibiotics. Contrast CT scan was withheld due to deranged renal function tests.

After 10 days of hydration and antibiotics, the abdominal pain reduced and serum creatinine dropped to normal levels (1.0 mg/dL). However, there was persistently raised total WBC count (now 33,000/ml) and raised serum procalcitonin (marker of sepsis). A contrast CT scan was done at this time, which revealed abdominal and pelvic fluid collections with peritoneal thickening. It also revealed diffuse wall thickening of the urinary bladder, with sacculations and suspicious wall thinning in its anterior and superior aspects. A CT urography study in prone position was performed subsequently, which revealed positive contrast from the bladder filling a linear tract extending from the anterior part of its dome on the right side and reaching the edge of the pelvic collection. Thus, a diagnosis of spontaneous bladder perforation with peritonitis was made.

The patient was conservatively managed with antibiotics and bladder catheterization.

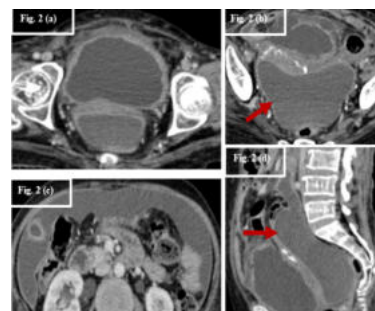


Fig. 2. Contrast-enhanced CT scan few days later revealed - distended urinary bladder with diffuse thickened wall, sacculations and trabeculations at its dome (2 a and b), with loculated pelvic collection (red arrows) and free fluid, with enhancing peritoneal thickening (2 c and d).

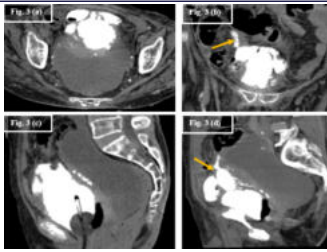


Fig. 3. CT urography shows positive contrast in the urinary bladder (a – axial, b-coronal, c and d – sagittal) filling a linear tract extending from the anterior part of its dome on the right side (yellow arrows) and reaching the edge of the pelvic collection.

DISCUSSION:

Spontaneous rupture of the urinary bladder (SRUB) - intraperitoneal or extraperitoneal, is a rare and life-threatening event (2). An accurate diagnosis followed by surgical intervention is the key for a successful outcome.

Pathophysiology of bladder rupture can be due to: (i) overdistension and increased bladder pressure, or (ii) weakening of bladder wall (either by inflammation or malignant infiltration). The former can be caused by urethral strictures, bladder outlet obstruction, neuropathic bladder, continuous bladder irrigation or alcohol binge drinking with non-voiding due to alcohol stupor. Causes of bladder wall weakening include chronic inflammation like tuberculosis, malignancy, cystitis, long-standing indwelling catheter and radiotherapy for pelvic malignancies (3,4).

This rare life-threatening event is often complicated by the fact that the presentations may be vague and varied, which leads to delayed diagnosis and intervention in a patient who is probably already in an advanced stage of the disease. The most frequent location for intraperitoneal perforation was the dome or the posterior wall of the bladder (5). A majority of such patients present with diffuse abdominal pain with poor localizing signs, distension and passage of low volumes of urine (that maybe blood-tinged). In our case, the patient had vague abdominal complaints with a picture of hyponatremia and pseudo renal failure initially, with peritonitis from the uroascites setting in soon afterwards. The diagnosis of SRUB is challenging; therefore, most patients were misdiagnosed with acute abdomen and inflammation of the digestive system. According to Mallick et al., an accurate initial diagnosis of urinary bladder rupture was made in 2 out of 15 case reports between 1967 and 2007 (6).

A ruptured bladder leads to urinary ascites—where free urine leaks into the peritoneal cavity. This may in itself present as lower abdominal pain, oliguria, and acute renal failure (7). A previously normal but suddenly elevated serum urea and creatinine may be a key feature in the diagnosis of urinary ascites. The new onset of renal failure in this clinical case is based on the concept of “reverse autodialysis” of the peritoneal membrane. This is a reverse form of continuous ambulatory peritoneal dialysis, whereby the peritoneum reabsorbs urea and creatinine from the leaked urine, causing a subsequent rise in serum levels. Urinary ascites may undergo autodialysis and therefore diagnostic peritoneal tap in urinary ascites is of limited use after 24hrs.

Early diagnosis and treatment of SRUB are closely linked to better prognosis (8,9). A high index of suspicion should be maintained in patients with an acute abdomen, biochemical evidence of renal dysfunction and have associated pre-disposing conditions such as enterocystoplasty, bladder malignancy, pelvic irradiation, inflammation, infection or long-standing indwelling catheter.

Ramcharan et al. described the importance of analysing the ascitic fluid for urinary constituents via Diagnostic Peritoneal Tap (DPT). An ascitic creatinine : serum creatinine ratio >1.0 is termed highly suggestive of an intraperitoneal urine leak (10). A report by Hayashi W et al., concluded that the possibility of intraperitoneal bladder rupture should be considered if mesothelial cells are seen in the patient's urine (11).

In the past, the gold standard for diagnosis was the cystogram (12); however, in the acute situation with worsening physiological variables, this luxury may not always be available to the clinician. In these conditions, CT cystography can be the best recommended

preoperative evaluation for suspected bladder rupture, and it can allow simultaneous assessment of multiple abdominal organs (13-16).

There are no specific guidelines for the treatment of SRUB. Basavaraj DR et al., recommend that conservative management is a better option than surgical intervention (17). The principles of conservative treatment are adequate urine drainage and antibiotic therapy. For urine drainage, an indwelling catheter or puncture drainage catheter may be used.

CONCLUSION:

SRUB often presents with non-specific symptoms, which results in missed or delayed diagnosis. In the elderly age group, one should maintain a high index of suspicion in patients with urinary symptoms and abdominal pain suggestive of peritonitis. In every patient with ascites, hyponatremia and biochemical evidence of renal failure, uroperitoneum should be considered as a differential diagnosis. CT cystography is considered the best accurate non-invasive diagnostic and evaluation tool for suspected bladder rupture. Early diagnosis and management of SRUB are crucial for an uneventful recovery.

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