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Spontaneous Bladder Rupture: A Rare Cause of Acute Abdomen

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ABSTRACT

Spontaneous bladder rupture is a rare but serious cause of acute abdomen that often poses diagnostic challenges due to its nonspecific clinical presentation. It typically occurs in the context of underlying conditions such as bladder diverticula, malignancies, or neurogenic bladder dysfunction. We present the case of a patient who developed a spontaneous bladder rupture secondary to a bladder diverticulum, with atypical symptoms that initially led to a delay in diagnosis. The patient presented with diffuse abdominal pain, oliguria, and elevated serum creatinine levels, with initial imaging suggesting peritonitis. A CT scan confirmed the diagnosis, and the patient underwent emergency surgical repair. The article highlights the importance of considering bladder rupture in the differential diagnosis of acute abdomen, particularly in patients with risk factors for bladder diverticula. Early recognition and prompt surgical intervention are essential to avoid severe complications such as sepsis, peritonitis, and renal failure. This case underscores the need for heightened clinical suspicion in cases of atypical acute abdomen to ensure timely and appropriate treatment.

KEYWORDS :

Spontaneous bladder rupture, Acute abdomen, Peritoneal contamination

MAIN ARTICLE

CASE REPORT:

A 55-year-old male patient with a history of benign prostatic hyperplasia (BPH) under treatment presented to the emergency department with diffuse abdominal pain lasting four days. On clinical examination, he was febrile and exhibited generalized abdominal tenderness. Laboratory tests revealed significant leukocytosis at 33,000/mm^3, with a predominance of neutrophils (18,000/mm^3), and a markedly elevated C-reactive protein of 360 mg/L. Serum creatinine was also elevated at 150 mg/L, despite no known history of renal disease, suggesting acute kidney injury likely related to the ongoing inflammation or infection.

An urgent non-contrast abdominal CT scan was performed, revealing a well-defined prevesical fluid collection. Figure 1 illustrates the findings: (A) axial slice and (B) coronal slice showing perivesical ascites (red star) and fluid tracking along the right paracolic gutter (yellow star). These images raised suspicion for a urinoma or bladder perforation, prompting further imaging.

To determine the bladder origin of the collection and achieve an accurate diagnosis, a delayed contrast-enhanced CT scan was performed after consultation with the nephrologist. Due to delayed renal excretion of the contrast agent from the patient's renal insufficiency, the intravenous contrast study was non-informative. Figure 2 shows a sagittal slice after contrast injection, revealing contrast at the level of the urinary catheter, confirming that retrograde administration was needed.

Subsequently, iodinated contrast was administered directly via the urinary catheter, allowing optimal bladder filling. Figure 3 demonstrates an axial slice of the bladder after contrast, revealing multiple diverticula, and Figure 4 shows the passage of contrast into the peritoneal cavity, with the red arrow indicating the site of communication between the bladder and the peritoneum.

Based on the clinical and imaging findings, the patient was taken directly to the operating room, where surgery was performed without complications. The patient is currently recovering well.

DISCUSSION:

Spontaneous rupture of the bladder (SRB) is a rare condition, representing a small proportion of bladder ruptures, most of which are traumatic or iatrogenic. Rupture occurring on a bladder diverticulum is even more exceptional. In their historical series, Keeler and Sant reported that most diverticular ruptures occur in the setting of increased intravesical pressure or chronic infection, highlighting the fragility of the diverticular wall, which lacks a full muscular layer[1].

Pathophysiologically, a bladder diverticulum corresponds to a herniation of the mucosa through the detrusor muscle, creating an area of structural weakness. This wall fragility explains the increased risk of perforation during sudden increases in intravesical pressure or local inflammation. Recent case reports confirm that urinary tract infection, acute urinary retention, and bladder outlet obstruction are frequently associated factors [2][3].

Imaging is crucial due to the often misleading clinical presentation, which may mimic a non-urologic acute abdomen. CT cystography is currently considered the reference standard for confirming bladder rupture, allowing direct visualization of contrast extravasation and distinction between intraperitoneal and extraperitoneal rupture [4] [6]. In diverticular ruptures, imaging not only confirms the presence of leakage but also precisely localizes the perforation, typically at the neck or wall of the diverticulum. Park et al. detailed CT and cystographic findings of diverticular rupture, emphasizing the value of retrograde contrast injection to demonstrate extravasation [6]. Abdominal ultrasound can also suggest the diagnosis by demonstrating free fluid and, occasionally, a discontinuity in the diverticular wall. Itoh and Kounami reported a case initially diagnosed by ultrasound, showing that this modality may guide emergency diagnosis when CT is not immediately available [5]. Nevertheless, its sensitivity remains lower than that of cystographic CT.

Recent reports also highlight the possibility of pseudo-renal failure secondary to peritoneal reabsorption of extravasated urine, which can mislead the diagnosis toward nephrological disorders if imaging is delayed[3]. Radiologic distinction between intraperitoneal and extraperitoneal rupture guides treatment strategy. Intraperitoneal ruptures, more common in diverticula due to their dome-lateral location, generally require urgent surgical repair [1][2]. In contrast, selected extraperitoneal ruptures may be managed conservatively with prolonged bladder drainage under radiologic monitoring [2]. Therefore, imaging is not only diagnostic but also crucial for management decisions, especially in diverticular ruptures where precise anatomical localization dictates the surgical approach.

CONCLUSION:

spontaneous intraperitoneal rupture of a bladder diverticulum is a rare but critical surgical emergency. When acute renal failure, complicated ascites, and peritoneal fluid with creatinine or potassium levels higher than serum levels are present, the suspicion of intraperitoneal urine leakage should not be delayed. Early diagnosis is essential for timely surgical intervention, helping to prevent unnecessary renal replacement therapy.

FIGURES

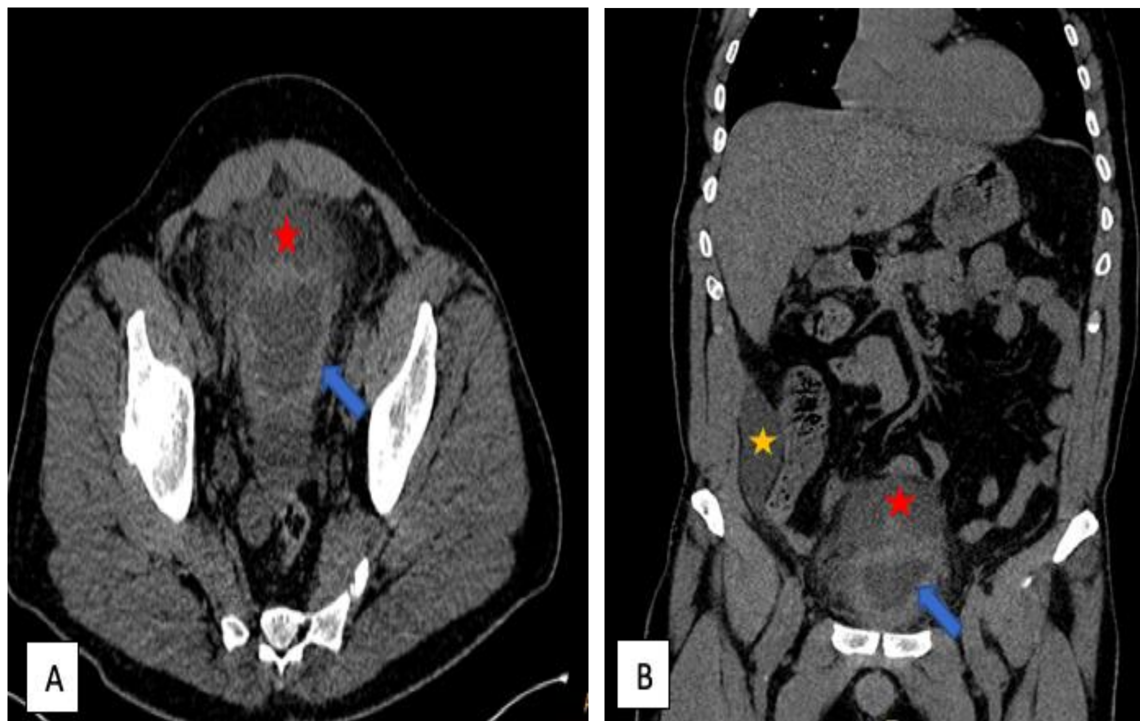

Figure 1 : Non-contrast abdominal CT images: (A) in axial slice, and (B) in coronal slice showing perivesical ascites (red star), and at the level of the right paracolic gutter (yellow star).

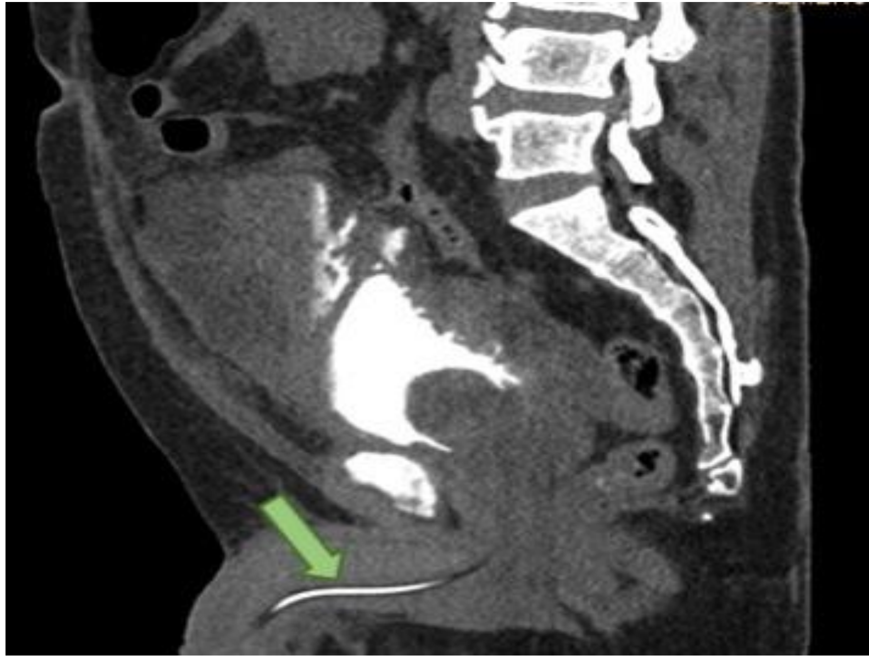

Figure 2 : Sagittal slice of an abdominopelvic CT scan after contrast injection, revealing contrast at the level of the urinary catheter.

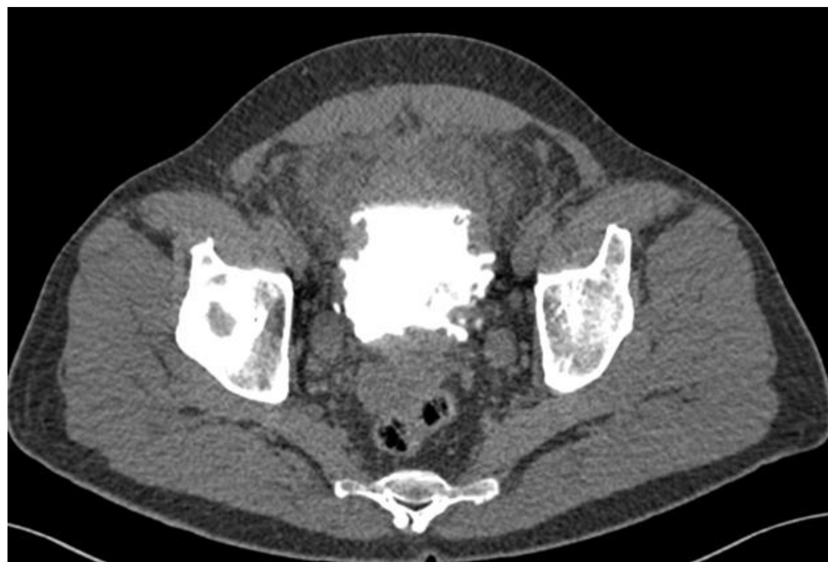

Figure 3 : Axial slice of an abdominopelvic CT scan after contrast injection, demonstrating a diverticulum in the bladder.

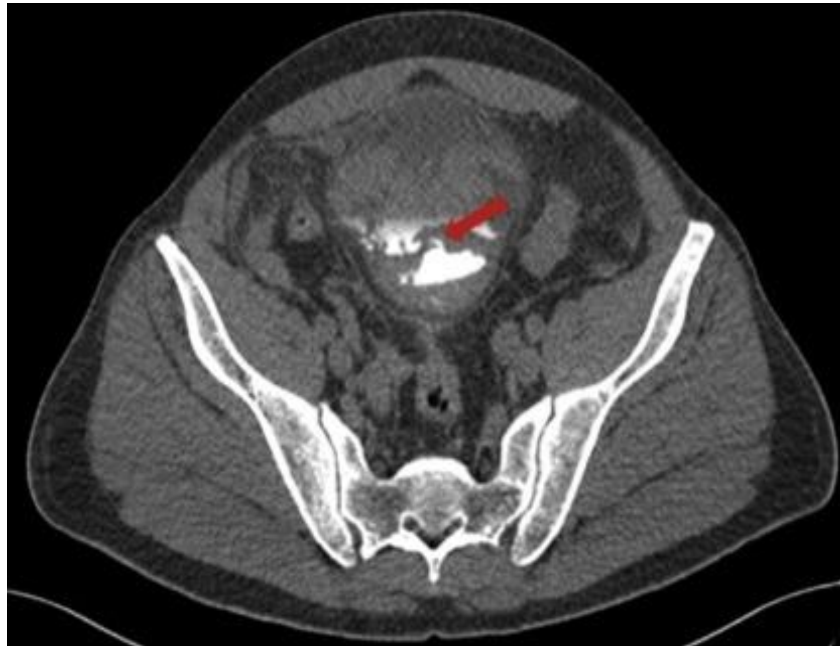

Figure 4 : Abdominopelvic CT scan in axial slice after contrast injection showing the passage of contrast into the peritoneal cavity: the red arrow indicates the site of communication

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REFERENCES

[1] L. L. Keeler et G. R. Sant, « Spontaneous rupture of a bladder diverticulum », J. Urol., vol. 143, no 2, p. 349-351, févr. 1990, doi: 10.1016/s0022-5347(17)39958-5. https://doi.org/10.1016/S0022-5347(17)39958-5

[2] D. A. Ostrowski, B. D. Cortese, R. R. Chelluri, R. C. Kovell, A. J. Wein, et D. J. Lee, « Spontaneous rupture of a bladder diverticulum with delayed open surgical repair », Urol. Case Rep., vol. 44, p. 102165, sept. 2022, doi: 10.1016/j.eucr.2022.102165. https://doi.org/10.1016/j.eucr.2022.102165

[3] X. Zhang, G. Zhang, L. Zhang, C. Sun, N. Liu, et M. Chen, « Spontaneous rupture of the urinary bladder caused by eosinophilic cystitis in a male after binge drinking: A case report », Medicine (Baltimore), vol. 96, no 51, p. e9170, déc. 2017, doi: 10.1097/MD.0000000000009170. https://doi.org/10.1097/MD.0000000000009170

[4] V. S. Cardoso, M. Sousa, F. Campos Costa, P. Pinto Gonçalves, et J. M. Guerreiro, « Spontaneous Rupture of a Urinary Bladder Diverticulum in Women: A Rare Cause of an Acute Abdomen », Cureus, vol. 15, no 7, p. e42622, juill. 2023, doi: 10.7759/cureus.42622.
https://doi.org/10.7759/cureus.42622

[5] N. Itoh et T. Kounami, « Spontaneous rupture of a bladder diverticulum: ultrasonographic diagnosis », J. Urol., vol. 152, no 4, p. 1206-1207, oct. 1994, doi: 10.1016/s0022-5347(17)32543-0.
https://doi.org/10.1016/S0022-5347(17)32543-0

[6] Park HS, Kim SH, Kim SH, et al. Spontaneous rupture of a bladder diverticulum: CT and cystographic findings. J Korean Radiol Soc. 2006;54:293-295.
https://doi.org/10.3348/jkrs.2006.54.4.293