

# Spontaneous urinary bladder rupture: a rare differential for lower abdominal pain in a female patient

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## ABSTRACT

We report a rare case of spontaneous “idiopathic” rupture of the urinary bladder in a 38-year-old previously-fit and -well woman, who presented with symptoms of severe lower abdominal pain. Computed tomography of the abdomen and pelvis indicated the preliminary findings, but the final diagnosis was confirmed only at laparoscopy. The bladder was repaired. The postoperative cystogram showed excellent healing of the bladder, with no further intra-abdominal urinary leakage.

**Keywords:** bladder rupture, laparoscopy, spontaneous bladder rupture, urinary bladder

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## INTRODUCTION

Spontaneous rupture of the urinary bladder in a previously-fit and -well patient is very rare. A thorough literature search showed it has never been reported before, except in patients who have either undergone a pelvic surgery or who have had pelvic pathology or trauma.

## CASE REPORT

A 38-year-old nulliparous woman presented with a sudden onset of lower abdominal pain, which woke her up from deep sleep. There were no associated risk factors, such as pelvic growth, recent delivery, trauma, previous abdominoperineal surgery, dilatation and curettage, radiotherapy or vesicoureteric stone. The only significant past medical history was of depression and binge alcohol intake. Our patient initially presented to the accident and emergency department early in the morning with a sudden onset of sharp and constant lower abdominal pain, mostly located in the right and left iliac fossa and hypogastrum. The pain became worse and was associated with symptoms of oliguria, burning micturation and dribbling. On examination, there was generalised tenderness, guarding and rigidity in the lower abdomen with positive rebound tenderness.



**Fig. 1** Axial CT image shows free fluid in the peritoneal cavity with irregularity in the urinary bladder wall.

All the initial blood results were normal with the exception of white blood cell count and neutrophils, which were  $22.3$  and  $20.3 \times 10^9/L$ , respectively. Pregnancy test was done twice and was negative on both occasions. On the basis of the clinical examination, the initial differential diagnosis included torsion  $\pm$  rupture of the ovarian cyst, acute appendicitis and pelvic inflammatory disease. Abdominal radiograph was inconclusive. On the basis of her symptoms, clinical findings and blood results, the patient underwent urgent computed tomography (CT) of the chest, abdomen and pelvis. CT showed free fluid in the abdomen with a thickening of a limited segment of the small bowel (Fig. 1), but did not reveal any hydronephrosis, urinary tract pathology, calculi or free air in the abdomen.

Based on the clinical and radiological findings, the patient underwent laparoscopy, which showed the cause of the patient's symptoms – intraperitoneal rupture of the dome of the urinary bladder (Fig. 2). The defect in the wall of the urinary bladder was sutured via laparoscope (Fig. 3), and the postoperative cystogram showed excellent recovery with no further urinary symptoms. The patient remained asymptomatic at follow-up two months postoperation.

## DISCUSSION

Spontaneous rupture of the urinary bladder in the absence

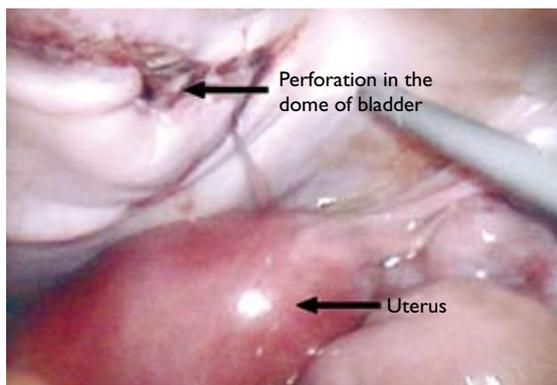
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**Fig. 2** Laparoscopic photograph shows the site of the urinary bladder rupture.



**Fig. 3** Laparoscopic photograph shows the sutures at the site of the urinary bladder. The defect was closed with 3 0 vicryl sutures.

of other risk factors is an extremely rare occurrence. Despite a detailed literature search, we only managed to locate very few cases of spontaneous rupture of the urinary bladder. The risk factors attributed to rupture of the urinary bladder include blunt trauma to the lower abdomen; cancer of the pelvic organ; irradiation therapy of pelvic tumours;<sup>(1-3)</sup> urinary bladder tumour; large ureterovesical stone; urethral or suprapubic urinary catheterisation; in some instances, in postpartum females<sup>(4)</sup> (spontaneous or iatrogenic<sup>(5)</sup>); atonic bladder; previous laparotomy; iatrogenic rupture secondary to continuous normal saline irrigation;<sup>(5)</sup> and binge alcohol intake<sup>(4)</sup> (the only risk factor in our case).

Though alcohol has been related to the rupture of the urinary bladder, none of the studies has revealed a clear link between the two. One of the mechanisms mentioned in the literature states that excessive alcohol intake decreases the sense of voiding of urine despite having a large amount of urine in the bladder.<sup>(4)</sup> If this is the case, then in the presence of the abovementioned risk factors or any history of trauma, bladder rupture should be in the list of the most likely differential diagnosis. It should be emphasised that the urothelium is only found in the urinary bladder, and despite being elastic, it does not allow any leakage of urine from the bladder walls; hence, the question remains of whether this property of the urothelium makes it more vulnerable to rupture or whether this is the direct effect of any of the metabolites in the alcohol.

In the literature, two different types of urinary bladder rupture have been documented, with varying signs and symptoms, viz. intraperitoneal rupture of the urinary bladder (associated with high mortality and morbidity) and extraperitoneal rupture of the urinary bladder. Common sites of urinary bladder rupture are

the dome of the urinary bladder (mostly associated with binge alcohol intake), the anterior wall (mostly seen in postpartum women), and the posterior wall (mostly seen in patients who have received irradiation for pelvic tumours in the past).<sup>(1,3,5)</sup> These sites are not specific for the causative factor, but it appears to be a general trend seen in various reports. The correlation between the site of rupture and its cause is still unclear.

Patients may present with pyrexia, lower abdominal pain, abdominal distention, dysuria, or oliguria, with a sudden onset of acute renal failure. The diagnosis of urinary bladder rupture demands a high index of clinical suspicion in patients presenting with lower abdominal pain, ascites, acute renal failure and azotaemia. Intelligent clinical judgment, coupled with urgent cystogram, CT cystography and laparoscopy, remains the gold standard in the diagnosis and treatment of urinary bladder rupture. During laparoscopy, retrograde cystourethrogram is extremely helpful in localising the site of the rupture. Contrast-enhanced CT of the abdomen, though a useful modality, remains a second-line investigation, especially when anticipating urinary bladder rupture, as it routinely does not show the minor tears in the viscus, especially while assessing the urinary bladder.

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