

Spontaneous intraperitoneal rupture of the bladder in an adult female

Kanchan Gupta^{1,2}, Bhawna Dev¹, Harsha C. Chadga^{1,3}

¹Department of Radiology and Imaging Sciences, Sri Ramachandra Medical College and Research Institute, Sri Ramachandra University, Chennai, India

²Department of Radiology, Sri Sathya Sai Institute of Higher Medical Sciences, Bangalore, India

³Columbia Asia Referral Hospital, Bangalore, India

KEY WORDS

bladder ► diverticulum ► spontaneous rupture

ABSTRACT

Rupture of the urinary bladder without the evidence of trauma is very rare. Although it is a life threatening condition requiring emergency treatment, medical aid is usually delayed due to lack of diagnosis. Usually it is diagnosed intra-operatively or retrospectively. We report a case of a 31 year old female with spontaneous rupture of the bladder due to bladder diverticulum, where diagnosis was made preoperatively using clinical assessment, USG (ultrasonography), and CT (computed tomography) cystography leading to a favorable outcome.

INTRODUCTION

Spontaneous intraperitoneal rupture of the urinary bladder is a rare event. Although prompt diagnosis and timely surgical intervention is the key for a successful outcome, the diagnosis is usually attained late; intra-operatively or retrospectively, thereby increasing the morbidity and mortality rate (>80%). Patients usually present initially with symptoms of urinary tract infection; the inability to pass urine, dysuria and hematuria followed by features of peritonitis-like acute abdominal pain [1, 2]. A high index of

suspicion is essential in the above clinical scenario. Therefore awareness is needed for this entity. CT cystography is an accurate non-invasive method for diagnosing bladder rupture [1]. Rupture of the urinary bladder should be included in the differential diagnosis of acute abdomen.

CASE REPORT

A 31 year old female presented with diffuse abdominal pain and inability to pass urine for one day. There was history of increase in the abdominal pain after making attempts to pass urine. Patient was hemodynamically stable. There was biochemical evidence of renal dysfunction with raised blood urea and serum creatinine. On ultrasound examination there was significant free fluid in the abdomen, both kidneys were normal, and the bladder showed a thickened wall with 260 ml of urine. For post-void volume assessment the patient went to pass urine, but complained of inability to pass urine. However post-void residue was only 80 ml. Correlating all the clinical and sonographic features, with stress upon significant reduction in post-void residual volume and the patients' inability to pass urine, the diagnosis of urinary ascites and possible defect in the bladder was made. For confirmation of the ultrasound findings plain CT scan followed by CT cystography was done on a 16 slice GE scanner injecting 350 ml of 90% diluted contrast media through a Foley catheter placed in the urinary bladder. The plain CT scan of the abdomen showed a significant amount of intraperitoneal fluid (Figs. 1A, B). CT cystography confirmed the intraperitoneal rupture showing contrast within the intraperitoneal cavity (Figs. 1C, D, E) with Foley catheter extending through the bladder into the left side of the peritoneal cavity (Figs. 2A, B and Figs. 3A-D). The contrast was injected through the Foley catheter filling the intraperitoneal cavity confirming that the fluid was urine in nature. On cystoscopy a 1 cm rent was seen on the left of the dome of the bladder (Figs. 4A, B). The bladder wall seen around this rent was thinned out and transparent. The thinned out portion of the bladder was excised and the bladder opening was closed in two layers. Pathology of excised bladder wall revealed transitional

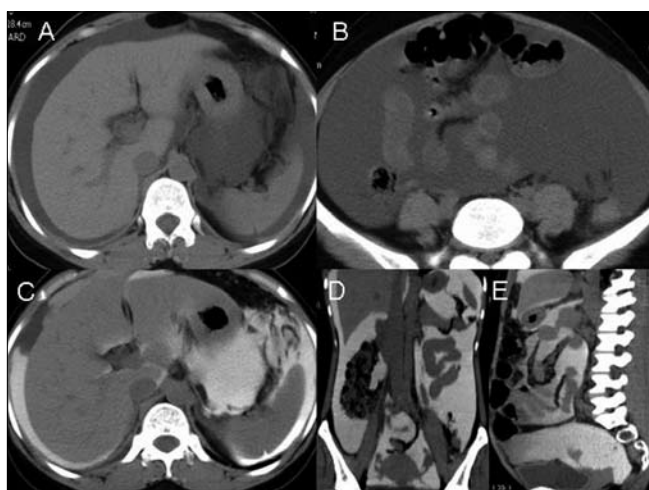


Fig. 1. Axial, coronal, and sagittal reformatted CT images: A and B showing significant amount of intraperitoneal fluid; C, D, and E showing contrast into the intraperitoneal cavity.

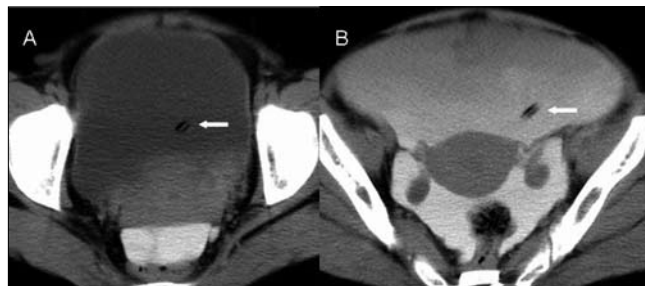


Fig. 2. CT cystogram: Axial image A showing Foley catheter within the bladder and B showing Foley catheter into the left side of the peritoneal cavity.

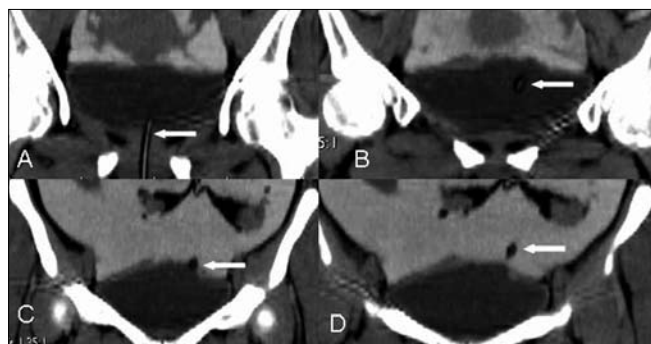


Fig. 3. Coronal reformatted images C to D showing Foley bulb extending through the bladder into the left side of the peritoneal cavity.

mucosa with inflammatory cells and thinned-out strands of bladder muscle, compatible with diverticulum. Three month follow-up voiding cystogram was normal and post-void residue was nil.

DISCUSSION

Spontaneous intraperitoneal bladder rupture is a rare clinical occurrence, 1 in 126,000 patients [3]. Usually it presents with unexplained urinary tract symptoms, oliguria, anuria, and vague abdominal pain [1, 2, 3]. There are usually biochemical changes suggestive of renal failure, which is due to peritoneal self-dialysis (transperitoneal absorption of urea and creatinine) [4]. This is also known as pseudo-renal failure where the kidneys, as such, are normal [4].

The most common causes of spontaneous rupture of urinary bladder are chronic inflammation, bladder outflow obstruction, and malignancy [5]. Associations with indwelling catheters, instrumentation, neurogenic bladder, substance abuse, vesical calculus, enterocystoplasty and radiation have also been mentioned [6, 7]. The presence of diverticulum is mentioned only in a few case reports with necrosis of diverticulum wall due to chronic inflammation or radiation [8]. The common denominator to cause rupture is an increase in intravesicular pressure along with weakening of the bladder wall. A concept of vesical infarction following ischemia due to over-distention of the bladder has also been described [2, 7].

In spite of its unique presentation, the diagnosis is usually attained at laparotomy [2] and is associated with a very high mortality rate, more than 80% [2].

Cystography has been recommended although usually not done prior to laparotomy [3]. CT cystography is diagnostic of bladder rupture [7]. A CT cystography technique by Vaccaro et al. mentions 90% dilution of the contrast. At least 350 ml is required for adequate distension of bladder and 250-300ml to safely rule out a tear [9].

Bladder perforation should be suspected as one of the cause of the abdominal pain especially if the history and findings indicate a urinary tract disorder. If the diagnosis is not delayed, the patient can be provided with proper surgical treatment, thereby reducing the morbidity and mortality. Schraut WH et al. had mentioned that with earlier diagnosis and earlier surgical treatment, the mortality rate is likely to be reduced [10].

CONCLUSION

Features of peritonitis with signs of biochemical renal failure and urinary tract symptoms should raise the suspicion of spontaneous rupture of bladder. Ultrasound examination with careful assessment of pre-void and post-void residual volume can sug-

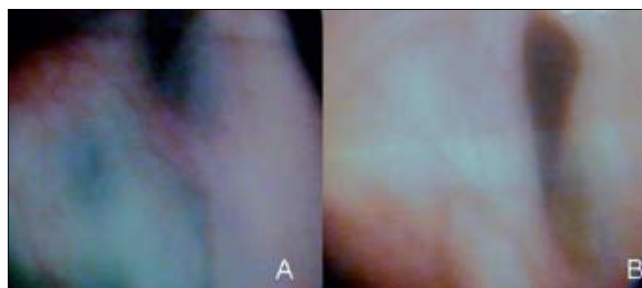


Fig. 4. A and B cystoscopic images showing rent in the left of the dome of the bladder

gest the abdominal fluid to be urinary ascites. CT cystography is the modality of choice for confirmation of bladder rupture. Preoperative diagnosis of spontaneous rupture of bladder leads to a favorable outcome.

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Correspondence

Kanchan Gupta
Sri Sathya Sai Institute of Higher Medical Sciences
Department of Radiodiagnosis
EPIP Area, Whitefield
Bangalore 560066
Karnataka, India
phone: +91 988 092 78 37
kanchangupta76@gmail.com