Trauma and reconstruction

Idiopathic spontaneous rupture of the urinary bladder: An unusual presentation of intraperitoneal bladder rupture managed conservatively

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Introduction

Spontaneous rupture of the urinary bladder (SRUB) is uncommon and associated with significant morbidity and mortality. Early detection of SRUB is challenging and there are no published guidelines for management. There may be a select group of patients with an intraperitoneal urine leak that can be managed conservatively with an indwelling urinary catheter. We report the unusual presentation of a patient with spontaneous bladder rupture who was successfully managed conservatively with an indwelling urinary catheter.

Case presentation

A 48-year-old Caucasian female presented to the emergency department with sudden onset generalised abdominal pain. This was preceded by a non-urgent sensation to void. There was no history of blunt abdominal trauma and the patient reported no haematuria. She had a distant surgical history of gastric sleeve, left salpingo-oophorectomy in the context of ectopic pregnancy and ablation of uterine fibroids. Furthermore, an intrauterine device in situ was placed 15 months prior to this presentation for contraceptive purposes. She was otherwise fit and healthy with no consumption of alcohol and normal urinary voiding. On examination, her abdomen was distended. Palpation elicited right side tenderness with no evidence of peritonism. Routine blood tests revealed an elevated white cell count of 14.8 \times 10^6/L and creatinine of 388 \mu mol/L. Computed tomography (CT) of her abdomen and pelvis revealed large amounts of free fluid in the peritoneal space (Fig. 1). The patient was admitted to hospital under the care of the general surgery team for further investigations. An indwelling urinary catheter (IDC) was placed for fluid balance, there was no visible haematuria and the patient's pain resolved following catheterisation. An ascitic fluid aspiration was performed with ultrasound guidance for diagnostic and therapeutic purposes and 1.5L of serous fluid was obtained. Ascitic fluid analysis revealed a white cell count of 2100 \times 10^6/L, no growth on culture and a creatinine level of 77 \mu mol/L. The abdominal distension slowly abated over the next day and serum creatinine improved at 24 hours (73 \mu mol/L). After catheter removal two days later, the patient experienced further pain with an associated rise in serum creatinine (161 \mu mol/L). A urological opinion was obtained. A CT cystogram was performed and identified an intraperitoneal bladder rupture at the bladder dome with a small bladder defect. Following regular clinical assessments, the patient was clinically well with no haemodynamic compromise, no evidence of intra-abdominal sepsis and resolution of pain and therefore was considered suitable for a trial of non-operative management. The patient was discharged after 7 days with a urinary catheter on free drainage for a further 14 days. Repeat CT cystogram did not show any contrast leak (Fig. 2) and IDC was removed with no complications in 3 months of follow up. An outpatient flexible cystoscopy was performed at 6 weeks with no abnormality detected.

Discussion

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the broad categories are traumatic, iatrogenic, pathological and idiopathic.

Spontaneous rupture of urinary bladder (SRUB) is either pathological or idiopathic and usually intraperitoneal.2,4 SRUB is considered a rare emergency and has significant morbidity and mortality.1 There are very few cases of SRUB with no identifiable explanation. The diagnosis of SRUB has been described as challenging and there are no clear guidelines on optimal investigation or management.2 The unusual features in this case that delayed diagnosis include benign clinical history, absence of visible haematuria, absence of peritonism and biochemical intraperitoneal fluid analysis with a low creatinine concentration consistent with serum.

A review of the literature revealed that most reported cases of SRUB are attributed to tumors, cystitis, connective tissue disorders, binge alcohol consumption, diverticulum rupture, bladder outlet obstruction, diabetes, radiation treatment, pregnancy and neurogenic bladder.1–4 The underlying pathological mechanisms of SRUB are associated with weakening of the bladder wall and/or distension of the bladder with a failure in neurosensory mechanisms. Therefore, thorough medical history is important in identifying pathologies that may predispose to bladder rupture.

Visible haematuria and peritonitis are commonly reported in cases of SRUB and are important to identify on examination.2,4 However, these signs may be absent and this case is an example of an atypical presentation.

A clinically well patient and diagnostic uncertainty led to an intraperitoneal fluid aspiration for this patient. The normal ratio of urinary creatinine to serum creatinine has been described as 30:1 to 100:1.3 While intraperitoneal urinary creatinine is often reabsorbed reducing the fluid: serum creatinine ratio, a normal fluid: serum ratio has never been reported in the literature for a SRUB. The explanation for this is unclear and the possibilities may include handling and laboratory error. While this is a rare case, the majority intraperitoneal bladder ruptures demonstrate urinary ascities with an elevated fluid: serum creatinine ratio that aid diagnosis.

CT cystography is considered the investigation of choice in a patient with suspected bladder rupture as it has high diagnostic accuracy.3 Fluoroscopic cystography is considered equivalent in its diagnostic yield for bladder rupture in the emergency setting. However, it can be time consuming and does not provide information about surrounding pelvic structures.5 Choice of technique is influenced by availability of resources, clinician preference and patient factors.

While various scientific societies have published recommendations for traumatic bladder rupture, no such guidelines exist for spontaneous bladder rupture. Of published case reports of intraperitoneal SRUB, the majority undergo primary bladder repair.3 However, we have demonstrated conservative management of SRUB can be considered for select patients with favourable characteristics. This includes patient’s clinical status, symptoms, small defect, absence of visible haematuria and no signs of infection. In this case, conservative management was successful in managing intraperitoneal bladder rupture. In the event of failed conservative management, definitive surgical management should be offered.

The follow up of patients with SRUB is not well described, and in this case, the decision was made to further investigate with flexible cystoscopy to identify potential causes. In the absence of an aetiology,
counselling the patient on future risk is challenging. However, recommendations were made to seek urgent medical attention in the event of classical features of SRUB or sudden onset abdominal distension, pain and reduced urine output.

**Conclusion**

SRUB should be considered in patients with a rise in serum creatinine and intraperitoneal free fluid even in the absence of classical features of bladder rupture. Idiopathic intraperitoneal SRUB can be conservatively managed in carefully selected patients with close follow up.

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