

Urinary bladder rupture as demonstrated on CT cystogram

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Section: Uroradiology & genital male imaging

Area of Interest: Urinary Tract / Bladder Abdomen

Procedure: Cystography / Uretrography

Imaging Technique: CT

Imaging Technique: Conventional radiography

Special Focus: Acute Case Type: Clinical Cases

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Patient: 32 years, male

Clinical History:

We report a case of a previously fit and well 32-year-old gentleman, who presented to the ED with a 3-day history of abdominal pain after a fall, secondary to alcohol intoxication. He was also found to have difficulties voiding urine and reduced bowel sounds on examination.

Imaging Findings:

Plain-abdominal and chest films (not shown) exhibited mildly dilated gas-filled bowel with a hazy underlying appearance. Laboratory tests displayed a raised serum creatinine of 586 and urea 17.2. The junior clinicians brought a request for contrast-enhanced CT of abdomen and pelvis to the department – not actioned due to the degree of apparent renal dysfunction.

The radiologist advised a second opinion by a urology senior, who then suggested the specific diagnosis of a ruptured bladder.

Therefore a CT cystogram (Fig. 1) using water-soluble contrast diluted in saline to 50mg/ml was performed, demonstrating a sizeable defect to the left side of the dome of the bladder with extensive intraperitoneal contrast spillage.

The patient underwent laparotomy and repair of ruptured bladder on the same day. One month after repair he underwent cystography (Fig. 2) with urografin contrast and a Foley's catheter in situ. This confirmed absence of contrast intra-abdominal extravasation, signifying successful bladder repair.

Discussion:

Ruptured bladder can either be intraperitoneal or extraperitoneal depending on the site of the lesion. Spontaneous bladder rupture has been documented along with associated risk factors, in this case both trauma and alcohol intoxication seem to be relevant. [1]

Upon repair of the ruptured bladder, serum biochemistry normalised within 24 hours. A raised serum urea and creatinine are almost always associated with an acute kidney failure as a result of a deterioration in glomerular filtration rate (GFR). Interestingly, on this occasion the rise in urea and creatinine was secondary to reabsorbing these compounds across the peritoneal membrane. Hence raised serum urea and creatinine in the presence of a normal GFR, reported to be rare. [2]

It is vital that the correct radiological assessment be performed to identify the type and extent of injury to assist with diagnosis and management. Conventional cystography is just as sensitive and specific for bladder rupture as CT cystography. [3] CT cystography does, however, help classify associated injuries in the trauma setting.

This case highlights that in patients with a sudden onset of abdominal pain, difficulties voiding and a biochemical

features of acute renal failure, a diagnosis of intraperitoneal bladder rupture should be suspected by clinicians. The definitive diagnosis was provided by cystography, which would not have been performed without an accurate clinical differential prior to imaging.

Differential Diagnosis List: Intraperitoneal bladder rupture, Extraperitoneal bladder rupture, Renal haematoma

Final Diagnosis: Intraperitoneal bladder rupture

References:

Scott DJ, Gibson P, Winney RJ, Fearon KC (1999) An unusual cause of abdominal pain following an alcoholic bout. *Postgrad Med J* 75:123–5

Heyns CF, Rimington PD (1987) Intraperitoneal rupture of the bladder causing the biochemical features of renal failure. *Br J Urol* 60:217–22 (PMID: [3676665](#))

Quagliano PV1, Delair SM, Malhotra AK. (2006) Diagnosis of blunt bladder injury: A prospective comparative study of computed tomography cystography and conventional retrograde cystography. *J Trauma* 61(2):410-21 (PMID: [16917459](#))

Figure 1

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Description: Computed tomography (CT) retrograde cystogram: Coronal plane view demonstrating a significant defect to the left side of the dome of the bladder. There is extensive intraperitoneal contrast extravasation. **Origin:** Department of Radiology, New Cross Hospital, Wolverhampton, U.K

Figure 2

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Description: Post-operative retrograde cystography illustrating an adequately distended bladder. There is absence of intra-abdominal contrast leakage, contour defects and filling defects. **Origin:** Department of radiology, New Cross Hospital, Wolverhampton, U.K