

INTRAPERITONIAL BLADDER RUPTURE IN THE ABSENCE OF PELVIC FRACTURE AND HEMATURIA: CASE REPORT

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ABSTRACT

A young man driving at moderate speed under the influence of alcohol with his seat belt strapped on rammed his vehicle into a stationary truck. He thereafter presented in the casualty of a tertiary hospital with complaints of progressive lower abdominal pain and inability to pass urine. Upon radiological investigation he was confirmed with intraperitoneal rupture of the urinary bladder with no evidence of pelvic fracture. He had surgical repair and was discharged 12 days post op with no complications and full recovery.

INTRODUCTION

Bladder injury or rupture may be caused by blunt trauma over the suprapubic region, stabs, missiles road traffic accidents or sports. Iatrogenic injuries of the bladder may result from difficult surgery like hysterectomy, or from radiotherapy for pelvic carcinoma.

Bladder rupture can be extraperitoneal or intraperitoneal¹. In extraperitoneal rupture of the bladder, the features include suprapubic pain and swelling due to urinary and blood extravasation into the retropubic space and failure to pass urine. Patients with intraperitoneal rupture may have urethral bleeding, failure to pass urine following the injury and signs and symptoms of peritonitis from the extravasation of urine into the peritoneum. Extraperitoneal bladder rupture is more common with a prevalence of 80-90% while intraperitoneal rupture is seen in about 10-20% of patients². Accurate identification of type of bladder injury is of paramount importance for proper management of the patients. Surgical repair is required for intraperitoneal rupture and combined intra and extraperitoneal rupture whereas catheter drainage is treatment modality for extraperitoneal rupture³. Delay in the diagnosis and treatment may increase patients' morbidity and mortality. Hence, rapid diagnosis is essential for optimal management.

This report presents a 35 year old man with trauma to the urinary bladder who needed radiological diagnostic certainty to confirm intraperitoneal rupture of the bladder and assist further progress in his management.

CASE REPORT

A 35 year old man was driving at moderate speed with his seat belt strapped on when he suddenly lost control and hit a stationary truck parked by the road side. There was momentary loss of consciousness after which consciousness was fully regained. He presented at the casualty of a tertiary hospital about 7 hours later with history of progressive lower abdominal pain and inability to pass urine. There was no history of prior urinary outlet obstruction. A urethral catheter was passed in a peripheral clinic where he was initially seen before being referred.

At physical examination, he was found alert but in moderate distress with perceptible alcohol breath. A urethral catheter was seen in-situ draining amber colored urine. He was afebrile, not pale and well hydrated. He showed a full abdomen with mild suprapubic tenderness. The liver and spleen were not palpable and the kidneys were non-balotable. Bowel sounds were normal. Pelvic compression revealed no compression tenderness. The cardiovascular, respiratory and central nervous systems were essentially normal clinically.

An initial impression of mild bladder contusion was made for which conservative management was prescribed before a more senior review suspected a bladder rupture. Among other ancillary investigations, the patient was sent to the Radiology department for Retrograde and Micturating urethrography and cystography. No evidence of pelvic bone fracture was seen in the preliminary films. Retrograde urethro-cystography done under fluoroscopic guidance showed normal urethra and well outlined urinary bladder. However, the micturition phase revealed poor bladder contraction and failure to void with another pool of contrast

forming over the pelvis and lower abdomen. The patient was taken for dynamic ultrasound interrogation which revealed free and clear extravescical fluid in the lower abdomen which increased in volume upon attempted micturition confirming an intraperitoneal bladder rupture. He was reviewed by the Urologists and worked up for surgery.

DISCUSSION

Traumatic urinary bladder lacerations commonly occur because of blunt injury to the lower abdomen which is usually associated with a pelvic fracture. The occurrence of bladder rupture without pelvic fracture is seen in less than 10% of cases⁴. Appropriate diagnosis is essential in the case of

intraperitoneal rupture for prompt surgical management in order to maximize chances of survival as mortality associated with it can be as high as 44%⁴.

Bladder rupture is commonly associated with suprapubic discomfort and inability to void in coherent, responsive patients. Intoxicated or unresponsive patients should warrant a higher index of suspicion for bladder injury in the presence of pelvic trauma. Patients with neurologic or preexisting urologic co-morbidities may not manifest typical symptoms of bladder trauma⁵.

The index case presented with progressively increasing lower abdominal pain and inability to pass urine following a road traffic accident for which a urethral catheter was earlier introduced. Macroscopically clear urine was found at presentation and there was no suggestion of preceding hematuria, an expected sign of urinary bladder rupture. Any microscopic hematuria was unobservable thus contributing to clinical diagnostic confusion. According to Hsieh et al⁶, the degree of gross hematuria does not correlate with the severity of injury particularly if some time has passed since the incident. The patient was seen at the casualty some hours after the trauma and could not volunteer any history of hematuria.

This patient was still with detectable alcohol breath hours after the road traffic accident suggesting that he had gone on an alcoholic binge from which he was returning when the incident occurred. It is a long established fact that alcohol induces diuresis such that for every 1gm of alcohol ingested, urine excretion is increased by 10ml⁷. Bladder filling is thus more rapid with attendant increased volume and frequency of voiding. A filled urinary bladder

in an intoxicated young man behind the steering with the seat belt strapped across had set the stage for the events that followed with a sudden deceleration as is the case in an RTA. McCort and Mindelzun⁸ had observed from their study on bladder injury and pelvic fractures that the inebriated patient was more at risk for intraperitoneal rupture which most likely results from sudden compression of the distended bladder and is less associated with pelvic fractures compared with extraperitoneal rupture.

Pelvic compression test for any pelvic fracture in the patient was negative and the initial clinical judgment excluding bladder rupture needed a higher index of suspicion from a superior review which incorporated radiological interrogation to correct and ascertain.

Computed tomography(CT) is now considered the radiological procedure of choice in the evaluation of abdominal and pelvic injuries after blunt trauma, but conventional cystography still plays an important role as it does not require a full bladder for the visualization of the bladder⁹. From their own studies, Quagliano et al¹⁰ concluded that CT cystography is equivalent to conventional cystography for detecting the presence or absence of blunt bladder injury. Ultrasonography can demonstrate extravescical urine collections as well as show any internal echoes that may suggest blood components. It can also be used to demonstrate dynamic events related to micturition in cases of bladder rupture.

Retrograde urethro-cystography (RUCG) studies carried out on the patient using ultravist, a low osmolar contrast medium, under the guidance of fluoroscopy demonstrated normally outlined urethra and urinary bladder. On antegrade studies however, the attempted micturating cysto-uretherography

(MCUG) showed poor bladder contraction and failure to void with another pool of contrast forming over the pelvis and lower abdomen consistent with bladder rupture. But the typical 'bowel loop impressions' on the extravescical contrast pool seen in intraperitoneal bladder rupture were ill defined necessitating an abdominal ultrasonographic adjunct. This clearly showed free extravescical fluid in the lower abdomen and its dependent portions on both longitudinal and transverse scanning protocols. The free fluid gradually increased in volume upon attempt at voiding thus confirming an intraperitoneal urinary bladder rupture.



Fig 4. Longitudinal pelvic scan showing urinary ascites



Fig 5. Transverse pelvic scan showing extravescical free fluid

The patient was taken to the theatre thereafter where intra-op findings included a 6cm transverse tear at the dome of the urinary bladder and clear serous fluid within the peritoneum. He did well post operatively and was discharged home on the twelfth post-op day.

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Fig 1: Retrograde urethrocytography showing normal urethra with contrast outlining the urinary bladder, (motionally blurred)



Fig 2: Cystogram showing a contrast filled, normal urinary bladder. No pelvic fractures.



Fig 3: Micturating phase demonstrating another pool of contrast over the pelvis and lower abdomen. Note that the urethra is not outlined.