

# Spontaneous puerperal extraperitoneal bladder wall rupture in young woman with diagnostic dilemma

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### ABSTRACT

A young female presented with an acute abdominal pain and oliguria for 1 week following normal vaginal delivery. No history of hematuria was present. Patient was having lochia rubra. Sealed uterine rupture was suspected clinically. Initial ultrasound of the patient showed distended urinary bladder containing Foley catheter balloon with clamping of Foley catheter and particulate ascites. Abdominal paracentesis revealed hemorrhagic fluid. Contrast-enhanced computed tomography of abdomen revealed ascites, distended urinary bladder and no extraluminal contrast extravasation in delayed scan. As patient condition deteriorated, repeat ultrasound guided abdominal paracentesis was done which revealed transudative peritoneal collection with distended bladder. Cystoscopy revealed urinary bladder ruptures with exudate sealing the rupture site. Exploratory laparotomy was done and a diagnosis of extraperitoneal bladder rupture was confirmed. The rent was repaired in layers. She was put on continuous bladder drainage for 3 weeks followed by bladder training. It presented in a unique way as there was hemorrhagic peritoneal tap, no macroscopic hematuria and urinary bladder was distended in spite of urinary bladder wall rupture which delayed the diagnosis and treatment. Complete emptying of urinary bladder before second stage of labor and during postpartum period with perineal repair is mandatory to prevent urinary bladder rupture.

**Keywords:** Extraperitoneal space, puerperium, rupture, urinary bladder

### Introduction

Spontaneous extraperitoneal rupture of bladder in the puerperium is reported in few literatures.<sup>[1]</sup> The word 'spontaneous' is used here as there was no antecedent history of trauma or instrumental delivery. It occurs if the urinary bladder was not emptied before the second stage of labor and during postpartum/puerperium period.<sup>[2]</sup> Strong clinical suspicion, early imaging, exploration, peritoneal/extraperitoneal lavage, bladder repair with good bladder drainage result favorable outcome. Our case was unique as patient presented late with fever, abdominal swelling, oliguria, and hemorrhagic peritoneal fluid on aspiration with no history

of macroscopic hematuria. Radiological imaging could not confirm urinary bladder rupture. Interdepartmental discussion and evaluation of patient strengthen the urinary bladder rupture suspicion and resulted good clinical outcome.

### Case Report

A 20-year-old patient presented with distended abdomen, oliguria and vague abdominal pain for 6 days following normal vaginal delivery in a primary health center. She gave history of prolonged labor lasting for about 14 h and delivery of a term healthy baby weighing 2830 g. The duration of second stage of labor was about 2 h. The baby was delivered transvaginally in cephalic presentation. No malrotation or malpresentation was

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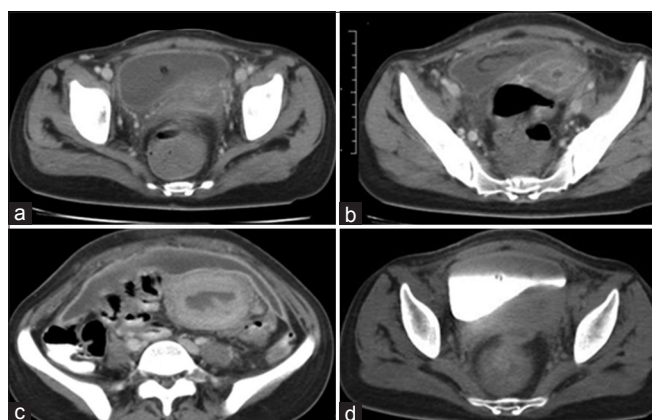
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evident. She developed fever on the 7<sup>th</sup> day of delivery and was treated conservatively in local hospital. She was referred to our hospital for further management as her conditions worsened. At the time of presentation to clinical Outpatient Department of Obstetrics and Gynecology, she was conscious, dehydrated and febrile. Her pulse rate and blood pressure were 104/min and 100/60 mm of mercury respectively. She was pale and anicteric. Per abdominal examination revealed tender lower abdominal diffuse swelling. Per vaginal examination revealed a closed external os of cervix with nonoffensive lochia rubra. Her urinary bladder was catheterized with Foley catheter. No hematuria was seen. Diagnostic abdominal paracentesis over right iliac fossa showed hemorrhagic fluid. Complete blood count revealed mild anemia (Hb - 8.8 g%), leukocytosis (16000/cc). Renal function was normal. Her ultrasonography (USG) after clamping of Foley urethral catheter revealed normal puerperal bulky uterus, distended urinary bladder with pelvic collection. Foley balloon was noted within distended bladder. She was advised for contrast-enhanced computed tomography (CECT) of abdomen for evaluation of hemoperitoneum with clinical diagnosis of uterine rupture. CECT of abdomen after clamping of urinary catheter revealed puerperal bulky uterus, distended urinary bladder and perivesical/pelvic collection. Delayed scan of abdomen shows contrast accumulation within the bladder and no extraluminal contrast extravasation [Figure 1]. CT cystography was not done as patient did not have macroscopic hematuria. Radiological diagnosis was pelvic/perivesical collection with bulky uterus. Patient developed high grade of fever and vomiting after admission. After interdepartmental discussion between radiology and gynecology, USG guided aspiration of peritoneal fluid and its cytology/biochemical analysis revealed transudative urine collection. USG review of pelvis showed distended bladder with pelvic collection. Exact site of bladder defect was not appreciated on USG. Plan for cystoscopy and exploratory laparotomy was made. About 8 cm × 6 cm perforation with thinning of adjacent bladder wall was noted on the anterior wall of the bladder in cystoscopy with exudate sealing the rupture site. Laparotomy revealed extraperitoneal urinary bladder rupture [Figure 2].



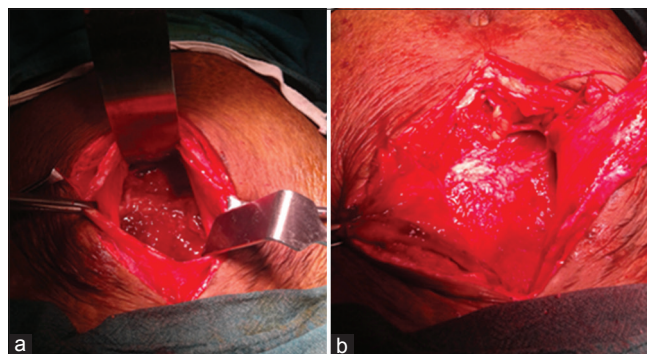
**Figure 1:** (a-c) Axial image of contrast-enhanced computed tomography abdomen shows distended urinary bladder with Foley catheter *in situ* with perivesical collection. (d) Delayed computed tomography scan of abdomen and pelvis shows layering of contrast within bladder lumen with no extraluminal contrast extravasation

Peritoneal and perivesical/pelvic cavity was lavaged. Urinary bladder rent was repaired after excising the adjacent necrosed bladder wall and the defect was closed primarily in two layers. There was no evidence of rupture of uterus. Bladder was drained through both suprapubic and urethral catheter. Suprapubic catheter was removed after 10 days and urethral catheter was removed after 3 weeks following a normal cystogram study. Her postoperative period was uneventful with good recovery and she was asymptomatic on 1 month of follow-up.

## Discussion

Rupture of uterus and/or intraperitoneal urinary bladder wall rupture during labor have been reported by many authors.<sup>[3]</sup> Isolated extraperitoneal bladder rupture following vaginal delivery is rare.<sup>[4]</sup> Spontaneous rupture of bladder is facilitated by preexisting bladder wall disease, urinary retention and history of trauma. Urinary bladder retention is common in intrapartum and postpartum period. Hence bladder injury is seen commonly during delivery if bladder emptying was not done before. Rupture of bladder can occur in case of overdistended bladder during precipitated labor.<sup>[2]</sup>

Sandler *et al.*<sup>[5]</sup> has described five types' bladder injuries with conventional cystography such as simple bladder contusion, intraperitoneal rupture, interstitial bladder injury, extraperitoneal bladder rupture and combination of intra and extraperitoneal bladder rupture. Intraperitoneal bladder injury results due to sudden increase pressure within distended bladder due to external force/pressure. It demonstrates extraluminal contrast extravasation to intraperitoneal cavity within bowel loops in cystography. Extraperitoneal bladder wall rupture is the most common type of injury due to trauma and caused due to penetrating or blunt trauma. Contrast extravasation is confined to perivesical and extraperitoneal space. The clinical diagnosis of extraperitoneal bladder rupture is difficult and requires a high index of suspicion. Bladder wall contusion and interstitial bladder wall injury are managed conservatively. Intraperitoneal and combined types of bladder injuries are managed by surgical repair. Extraperitoneal bladder rupture is usually managed by prolonged catheterization and antibiotics. However surgery is



**Figure 2:** (a) Intraoperative picture shows anterior infraumbilical dissection with anteroinferior urinary bladder wall rupture. (b) The ruptured urinary bladder wall is retracted by forceps before repairing

done in case of septicemia, infected urine/abscess formation in extraperitoneal area and bladder neck injury.<sup>[4,6]</sup> CT cystography can be done in patient even with impaired renal functions and is the investigation of choice for diagnosis of bladder injuries. It is done by retrograde administration of about 300–350 ml diluted (10%) contrast with saline into urinary bladder through urethral catheter followed by CT scanning of lower abdomen and pelvis. It detects the site of rupture and even small rent due to bladder distension. However delayed contrast CT scan in excretory phase will not show extraluminal contrast extravasation through the small bladder rent which is usually sealed by blood clot or omentum.<sup>[6,7]</sup> In our case, delayed CECT of abdomen could not demonstrate the bladder rupture site. CT cystography was not done as patient was not having macroscopic hematuria. After interdepartmental discussion and further cystoscopic evaluation, urinary bladder wall rupture was found. As patient was in septicemia with large bladder rent, operative repair was considered for early recovery of the patient.

Patient with sign and symptoms of anuria, oliguria, hematuria, vague abdominal pain, ascites and impaired renal function during postpartum state or puerperium should be evaluated for urinary bladder injury. Postpartum or puerperal retention of urine occurs due to painful episiotomy, perineal injury during delivery. Fetal head compresses the distended urinary bladder over pelvic brim and symphysis pubis during uterine contraction and results pressure necrosis and perforation of urinary bladder wall. Thus emptying of urinary bladder before delivery, postpartum and in puerperal state is to be encouraged strictly to prevent bladder wall rupture.

Urological investigation of patient for preexisting urinary bladder wall pathology such as neurogenic bladder and chronic bladder wall infection are to be done to prevent recurrent urinary bladder wall rupture.<sup>[2]</sup>

There is one fallacy in our study. The initial intraperitoneal aspiration was hemorrhagic and was sent for cytology and was not sent for biochemical analysis such as urea and creatinine to confirm urinary ascites as it was not suspected initially due to hemorrhagic nature of aspiration. The patient did not give

history of hematuria as she was primigravida and having lochia rubra and was not sure about the hematuria. The extraperitoneal hemorrhagic urine was thought to be getting collected extraperitoneally as patient was having oliguria.

## Conclusion

Patient in postpartum or puerperal state with abdominal swelling, pain abdomen, and oliguria, urinary bladder rupture with or without uterine rupture should be suspected. CT cystography is to be done for confirmation of bladder rupture. Extraperitoneal bladder ruptures are usually managed conservatively. However patient with large extraperitoneal rent with septicemia are to be treated surgically. Complete voiding of urinary bladder is to be encouraged before and after delivery during puerperium.

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## Conflicts of interest

There are no conflicts of interest.

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