

Missed Iatrogenic Bladder Rupture Following Normal Vaginal Delivery

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ABSTRACT

Bladder rupture following caesarian section is well documented complications. Intraperitoneal bladder rupture following normal vaginal delivery is very rare. Hereby, we present a case report of intraperitoneal bladder rupture presented late following normal vaginal delivery. We report a case of spontaneous intraperitoneal urinary bladder rupture following uneventful outlet forceps delivery in a 22-year-old primigravid woman with gestational diabetes mellitus and fetal macrosomia who presented with large urinary ascites, anuria and renal failure. Emergent exploratory laparotomy with repair of the intraperitoneal bladder rupture helped to prevent its potential complications.

Postpartum patients who undergo episiotomy or perineal repair may land up in unnoticed urinary retention which may rarely terminate in spontaneous urinary bladder rupture. Awareness of its manifestations amongst emergency physician would help to initiate appropriate timely management.

Keywords: Emergency department, Puerperium, Renal failure, Spontaneous, Urinary bladder

CASE REPORT

A 22-year-old primigravida woman with gestational diabetes mellitus and fetal macrosomia was induced at 37-weeks of gestation. The first stage of labour lasted for 40 minutes while second stage lasted for 20 minutes. To prevent maternal exhaustion, vaginal delivery was undertaken following use of episiotomy and outlet forceps. Urinary bladder was intermittently drained during the labour. A large male baby was born with birth weight of 4.2 kilograms. After delivery, mother was voiding normally without any issue and was discharged on postoperative day five. Subsequently, she presented two days later to our Emergency Department (ED) with one day of abdominal distension and anuria. Her vitals were normal including pulse rate of 100/minute, blood pressure of 110/70 mmHg and without fever or haematuria. She had no pelvic surgery in the past. She also gave no prior history of voiding difficulty. Abdominal examination revealed grossly distended abdomen with dullness on percussion however, without tenderness, guarding or rigidity. Per vaginal examination revealed healthy episiotomy wound, lochia rubra and closed internal cervical os. Urinary bladder was catheterized and approximately 3 liters of clear urine was drained following which abdominal distension was reduced. Her laboratory results revealed low haemoglobin of 8.3 gm%, abnormally increased WBC of 16500/cc (N84% L12% E4%), deranged blood urea of 60 mg/dl and serum creatinine of 2.5 mg/dl with normal serum electrolytes. Biochemical analysis of ascitic fluid confirmed it to be urine by testing ascitic fluid creatinine which was similar to urine creatinine. Computed Tomography (CT) cystogram study was performed by instillation of 300 cc of diluted iodinated contrast mixed with saline through the per-urethral catheter in the urinary bladder. No intravenous contrast was administered due to acute renal insufficiency. The

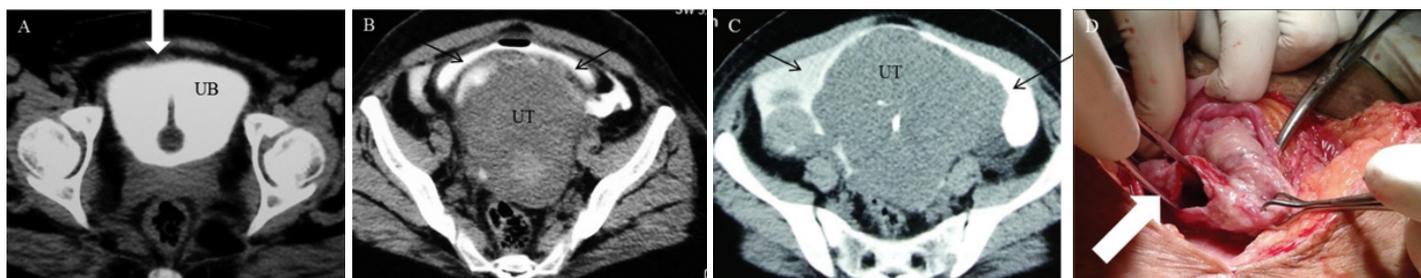
CT images revealed dense layering of iodinated contrast in the peritoneal space surrounding the bladder and outlining the bowel loops consistent with intraperitoneal rupture of the urinary bladder [Table/Fig-1a-c]. Note was made of the bulky uterus due to postpartum status.

Hence, emergent laparotomy was performed and lower midline incision through the trans-peritoneal route was created. Intraoperative, a 3 cm irregular defect was noticed in the dome of the urinary bladder consistent with intraperitoneal bladder rupture [Table/Fig-1d]. Bladder was large in capacity with diffusely thin walls. Both the ureteric orifices at ureterovesical junction were cannulated and exteriorized. Bladder wall was repaired primarily in two layers and adequately drained with supra-pubic and per-urethral catheters. Peritoneal lavage was also performed. A bulky uterus due to postpartum status was noted posterior to the bladder. A peritoneal drain was placed posterior to bladder and skin incision was closed in layers. Postoperative period was uneventful.

DISCUSSION

The anatomic proximity of lower urinary tract and reproductive tract predisposes them to iatrogenic injury during Obstetric and Gynecological cases. Among commonly involved organs are bladder and lower ureter [1]. Trigon of bladder rests on anterior vaginal fornix and base rests on lower uterine segment and cervix. It is most frequently injured during obstetric procedures [2].

Intraperitoneal urinary bladder rupture following vaginal delivery is usually seen in association with uterine rupture while isolated intraperitoneal bladder rupture following vaginal delivery is extremely rare with only a few cases reported in the English literature [3-5]. Intra-partum and post-partum status leads to poor emptying of



[Table/Fig-1a]: CT Cystogram showing probable site of rent in the anterior wall of bladder (arrowhead pointing towards anterior bladder wall rent) **[Table/Fig-1b]:** CT Cystogram showing uterus with extravasated contrast around peri vesical space **[Table/Fig-1c]:** CT cystogram showing extravasated contrast in peritoneal cul de sac **[Table/Fig-1d]:** Intraoperative bladder rent in the anterior wall of bladder

the urinary bladder thereby leading to increase tendency for urinary retention following delivery. Bladder rupture during puerperium can occur either due to its incomplete evacuation from pain or from primary bladder pathology. Thus, adequate bladder evacuation is utmost important to prevent this complication.

Pathophysiology of the bladder rupture in puerperium includes sustained pressure from the fetal head against the bladder during forceful uterine contractions which may lead to pressure necrosis of the bladder dome [4]. If the patient is not catheterized, bladder rupture is more likely during labour. Postpartum patients undergoing episiotomy or perineal repair frequently experience voiding difficulties which can lead to urinary retention. Interestingly, as these patients frequently pass small amount of urine, urinary retention may go unnoticed. The retention may terminate in gross bladder distention and subsequent spontaneous rupture [6].

In present case, it is evident from the biochemical changes that bladder rupture must have occurred at least 24 hours prior to the acute presentation. Moreover, bladder rupture during delivery in her case is very unlikely as her bladder was intermittently catheterized during delivery and outlet forceps were applied to reduce the bearing down effort. However, it is possible that she might have had voiding difficulties in the immediate postpartum period, which went unnoticed. Micturition difficulties would be expected due to a painful episiotomy which may discourage voiding thereby landing into urinary retention. In addition, the nulliparous women may confuse haematuria with lochia. Fortunately, these patients tend to remain well with minimal peritonitis if the urine remains uninfected [7].

Clinical signs and symptoms of anuria, oliguria, haematuria, vague abdominal pain and ascites along with abnormal blood biochemistry highly suggestive of renal failure, should alert the clinician about the possibility of a urinary bladder rupture. The faith of the urinary

ascites includes rapid urine absorption from the peritoneal cavity and then the equilibrium between ascitic fluid and plasma urea and creatinine concentrations. The studies have shown that serum urea and creatinine to be elevated in 45% of patients who present within 24 hours of bladder rupture, and in nearly 100% of the patients who present 24 hours after bladder rupture [8].

It is utmost crucial to encourage adequate bladder emptying and keep a close look on the urinary output in the postpartum period to prevent bladder rupture.

CONCLUSION

Postpartum patients who underwent episiotomy or perineal repair may land up in unnoticed urinary retention which may rarely terminate in spontaneous urinary bladder rupture. Awareness of the clinical, laboratory and radiology findings amongst emergency physician would help to initiate appropriate management in these patients.

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