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A rare cause of acute abdomen: Spontaneous bladder rupture following normal vaginal delivery

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Abstract

A 34-year-old woman presented with acute abdomen, and her paraclinical data showed evidence concerning renal failure and its consequences in addition to ascites upon ultrasonography. Her symptoms did not abate after dialysis, and she underwent laparotomy, which revealed bladder perforation. Consequently, cystorrhaphy and cystoplasty were done without postoperative complications.

Abstract

Background: Spontaneous bladder rupture is a potentially life-threatening condition that can rarely occur following vaginal delivery and urinary retention.

Case Presentation: This case report illustrates a 34-year-old woman who presented with signs and symptoms of acute abdomen, and her paraclinical data showed evidence concerning renal failure and its consequences in addition to ascites upon ultrasonography. Her symptoms did not abate after dialysis, and she underwent laparotomy, which revealed two-centimeter perforation of the bladder. Consequently, cystorrhaphy and cystoplasty were done without postoperative complications.

Conclusion: This case highlights the significance of considering bladder rupture as a differential diagnosis of acute abdomen in females after vaginal delivery.

Keywords

Urologic emergency; Bladder perforation; Postpartum; Urinary ascites; Laparotomy

Introduction

Spontaneous bladder rupture is a quite infrequent condition with a high mortality rate. Vaginal delivery and urinary retention are among the causes associate with spontaneous bladder rupture (1). Postpartum urinary retention is a relatively common condition that, if left untreated, may give rise to bladder rupture in rare events (2). Herein, we report a case of a spontaneous bladder perforation presenting with acute abdomen and pseudorenal failure and then discuss its pathophysiology, presentations, and management based on a review of the most recent literature.

Case Presentation

A previously healthy 34-year-old woman was brought to the emergency department with acute abdominal pain and dyspnea. Her abdominal pain started two days before admission, was progressive in intensity, and generalized in location. It did not radiate to any region, and there was no alleviating or exacerbating factor

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for her pain. Her abdominal pain was associated with two episodes of nausea followed by vomiting as she could not tolerate oral feeding. She also reported progressive dyspnea since the morning of her presentation day. She had been primiparous and had had an uncomplicated pregnancy with proper prenatal care. She had a normal vaginal delivery at 38 weeks and three days of her gestational age, five days before the presentation, which was not complicated with chorioamnionitis, postpartum hemorrhage, or fetal distress, and was given to a healthy baby girl. Her medications only included multivitamins and ferrous sulfate, and she had no significant allergic history. She did not use nicotine-containing products, drink alcohol, or use illicit drugs.

Upon physical examination, she appeared critically ill and was lying supine, reluctant to change her position, and not fully able to converse. Her temperature was 37.2°C, blood pressure 160/70 mm Hg, pulse 57 beats per minute, respiratory rate 26 breaths per minute, and oxygen saturation 97% while she was breathing ambient air. She was using accessory muscles of ventilation to breathe, but her lung was clear at auscultation. Abdominal examination revealed a moderately distended abdomen and shifting dullness on percussion. Her bowel sounds were reduced, and her abdomen had generalized tenderness and rebound tenderness.

The abnormal laboratory data comprises the hemoglobin of 11.8 grams per deciliter, the white cell count of 26400 per cubic millimeter with 79% segmented neutrophils, and the platelet count was 472,000 per cubic millimeter. The blood urea nitrogen level was 64 mg per deciliter, and the creatinine level was 7.3 mg per deciliter. The potassium was 7/2 mmol per liter, and the phosphorus was 7/9 mmol per liter. Measurement of arterial blood gasses revealed that the pH was 7.19, the partial pressure of carbon dioxide was 39.4 mm Hg, the bicarbonate level of 15, and the partial pressure of oxygen was 53 mm Hg, while 5 liters of oxygen was provided through an oxygen mask. Electrocardiogram revealed extreme axis deviation, flattening of P wave, short QT interval, wide QRS complex, and tall T wave in favor of hyperkalemia. Portable chest x-ray showed no significant abnormality. Ten milliliters of Calcium gluconate 10% was administered. An abdominopelvic ultrasound revealed moderate to severe free fluid in the abdominopelvic space, bilateral hydronephrosis, more prominent at the right kidney.

Urgent dialysis was performed. During and after dialysis, the patient's abdomen was reexamined, and its findings did not change from the first visit; generalized tenderness and rebound tenderness persisted. Accordingly, the patient underwent exploratory laparotomy. Four liters of urine were suctioned (Figure 1), and two-centimeter perforation at the posterior surface of the urinary bladder was found (Figure 2). Exploration of the whole abdomen, including the stomach, small intestine, large intestine, liver, and spleen, did not reveal any lesions. Cystorrhaphy and cystoplasty with an omental flap were performed. According to these observations of surgery, spontaneous bladder perforation was diagnosed. There was no complication postoperatively. The patient was discharged after six days with an acceptable condition, and at a two-week follow-up visit, she was stable and remained symptoms free.

Discussion

Spontaneous bladder rupture is an uncommon pathology that usually occurs due to alcohol intoxication, lower urinary tract obstruction, bladder malignancy or inflammation, pregnancy-related causes, bladder dysfunction, pelvic radiotherapy, and a history of bladder surgery or bladder diverticulum (3).

In our case, the patient reported incomplete voiding without catheterization before her vaginal delivery upon further questioning. Furthermore, episiotomy was done during the delivery process. Unemptied bladder without catheterization and voiding difficulty due to pain induced by episiotomy can result in urinary retention, which subsequently puts the patient at risk of bladder rupture. Fetal macrosomia and a prolonged period of the second stage of delivery are other risk factors that can predispose to this situation. Furthermore, fetal head pressure during uterine contractions on the intraperitoneal portion of the bladder will lead to increased visceral pressure and bladder wall necrosis. Other predisposing factors are epidural block, systemic narcotics use, perineal laceration, instrumental delivery, and deep vaginal tears (4,5).

Considering clinical and paraclinical presentations of spontaneous bladder rupture, the most common symptoms are abdominal pain, abdominal distension, oliguria, fever, hematuria, and vomiting, respectively, and our patient had the most frequently reported symptoms (5). Moreover, evidence of acute kidney injury was

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noticed in the patient's laboratory data, including increased serum creatinine, urea, and potassium level besides severe metabolic acidosis. Serum creatinine and urea will rise in 100% of patients after 24 hours of bladder rupture, and urinary ascites should be suspected when the analysis of fluid shows higher creatinine or urea than the serum with a ratio of ascitic fluid to serum creatinine that is greater than one and the high serum ascites albumin gradient. Urinary ascites will lead to equilibration of urine and plasma through a peritoneal membrane that causes pseudo-kidney injury pattern, including elevated serum creatinine levels, hyponatremia, hyperkalemia, and azotemia which justify the abnormal laboratory markers of our patient (4,6,7).

Given the therapeutic management, intraperitoneal bladder rupture must be surgically repaired. Laparoscopic management is indicated in hemodynamically stable women, but it was not advocated in our case as the source of the patient's ongoing acute abdomen was unknown, and a midline laparotomy was chosen (3,5).

Conclusion

In essence, this case report underscores that physicians should take note of spontaneous bladder rupture as a differential diagnosis in a female patient who presents with acute abdomen following vaginal delivery, and in order to avert this potentially life-threatening consequence of postpartum urinary retention, make sure of the emptiness of urinary bladder before the beginning of vaginal delivery.

Figure - Legend 1: A and B) The urine that was suctioned from the abdominal cavity is shown in the bottle. C) Empty urine bag implies that urine is depleted into the abdominal cavity instead of the urethra.

Figure - Legend 2: A) The jet of urine from the perforation site of the bladder. B) The two centimeters laceration at the posterior surface of the urinary bladder.

Acknowledgement

Ethical approval

This study did not include participants nor any interventional measure, however ethical approval was obtained from Iran University of medical sciences ethical committee.

Ethical committee approval number

IR.IUMS.REC.1401.22431.

Patient Consent

No identifiable information was disclosed in writing this article; however, written consent was obtained from the patient.

Author Contribution

FO and AT were the surgeons of the patient. SGH, PGH, and SHS wrote the initial draft. MGH revised the whole manuscript.

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Conflict of interest

The authors declare that there is no conflict of interest.

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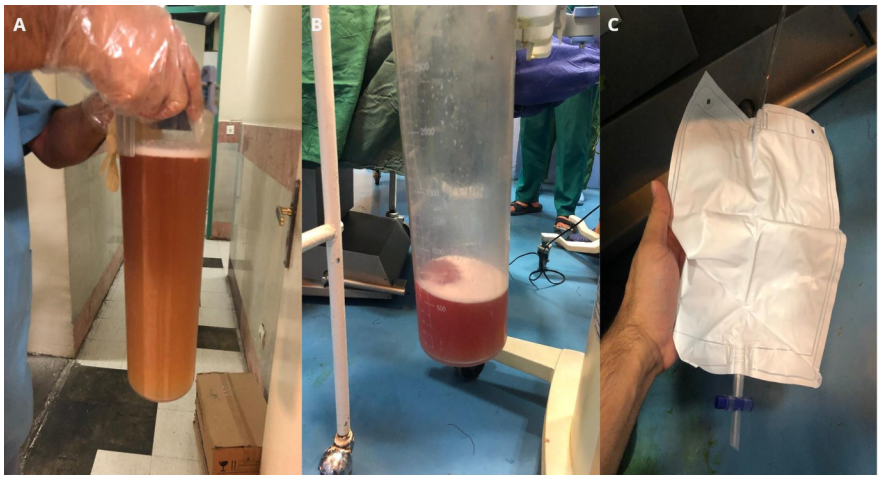

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