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Apparent AKI in a Patient with Ascites Following Laparoscopic Hysterectomy

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Case Description

A 39-year-old woman with a history of menorrhagia who underwent laparoscopic hysterectomy presented to the emergency department 4 days after surgery with abdominal pain and distention. Her vitals revealed the following: blood pressure 98/62 mm Hg, heart rate 110 beats/minute, oxygen saturation 99% on room air, and temperature 37.1 °C. Initial basic laboratory values were as follows: white blood counts 18.0×10^9/L with neutrophil predominance, hemoglobin 15.2 g/dl, platelets 190×10^9/L, sodium 134 mmol/L, potassium 4.9 mmol/L, chloride 101 mmol/L, bicarbonate 17 mmol/L, BUN 45 mg/dl (9–24), serum creatinine 7.4 mg/dl, calcium 9.0 mg/dl, albumin 3.7 g/dl, aspartate aminotransferase 20 U/L, alanine aminotransferase 25 U/L, alkaline phosphatase 90 U/L, total bilirubin 0.6 mg/dl, lipase 62 U/L, and lactate 2.4 mmol/L. Urinalysis was remarkable for hematuria with 25–100 isomorphic red blood cells/high-power field. Computerized tomography (CT) of her abdomen without intravenous contrast demonstrated moderate abdominal ascites. An indwelling bladder catheter was placed, and the patient underwent diagnostic paracentesis, with white blood cell count noted at 1288/μl (35% neutrophils), creatinine 15.9 mg/dl, and ascites-serum creatinine ratio of 2:14. The patient was started on antibiotics for peritonitis. A follow-up CT scan of her abdomen with intravenous contrast confirmed a full-thickness tear of the superior wall of her urinary bladder, with the bulb of the indwelling bladder catheter extending beyond the bladder and associated urinoma surrounding the catheter (Figure 1). She was diagnosed with bladder perforation and underwent open bladder repair emergently. Her serum creatinine improved to 0.5 mg/dl in 24 hours after the repair. An indwelling bladder catheter remained in place for 1 week for conservative management.

Bladder injury occurs after blunt or penetrating trauma, or in the setting of iatrogenic injuries. Gynecologic and colorectal surgeries are the most common surgeries associated with bladder injury (1). Bladder injury can be classified into intraperitoneal versus extraperitoneal injuries. Clinical manifestations include gross or microscopic hematuria, abdominal distension and tenderness, ascites, and/or difficulty voiding. Peritonitis, ileus, and sepsis are the common complications of intraperitoneal bladder injury (2).

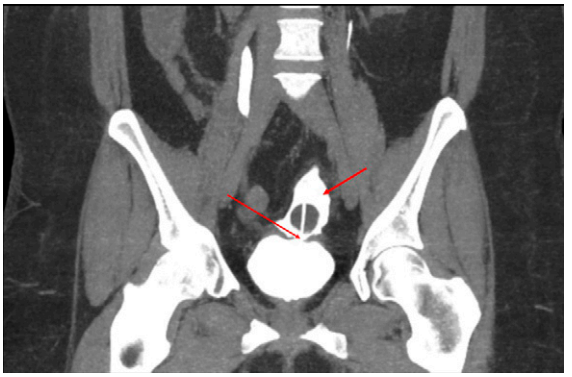


Figure 1. | Computed tomography scan of the abdomen with intravenous contrast demonstrates a full-thickness tear of the superior wall of the urinary bladder. The bulb of the indwelling bladder catheter extends beyond the bladder and is associated with urinoma surrounding the catheter.

Uroperitoneum can result in the reabsorption of urine into the systemic circulation, whereas sodium and chloride ions move in the opposite direction. This results in hyponatremia, metabolic acidosis, azotemia, and a rise in serum creatinine. Uroperitoneum should be expected when the ascites-serum creatinine ratio is >1:0 (3). It is essential to recognize that the rise in serum urea and creatinine is due to pseudoazotemia from the reabsorption of the urine, and not related to intrinsic kidney injury (4). In these scenarios, the observed elevated serum creatinine values should not preclude providers from using intravenous contrast if needed. Bladder injury is diagnosed radiographically by CT cystography (5). CT cystography was not performed in our patient in the setting of having clear evidence of the bladder injury in the CT abdomen and pelvis with intravenous contrast. Simple extraperitoneal bladder injuries can be managed conservatively; however, complex extraperitoneal and all intraperitoneal bladder injuries usually require surgical repair.

Teaching Points

- Uroperitoneum should be suspected when ascites-serum creatinine ratio is >1:0.

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- In the uroperitoneum setting, the rise in serum urea and creatinine is due to pseudoazotemia from the reabsorption of the urine, and not related to intrinsic kidney injury.
- In the uroperitoneum setting, the elevated serum creatinine values should not preclude providers from using intravenous contrast if needed.
- Bladder injury is diagnosed radiographically by CT cystography.

Disclosures

All authors have nothing to disclose.

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Author Contributions

C. Cervantes wrote the original draft; and M. Hanouneh and S. Menez reviewed and edited the manuscript.

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