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An unusual case of urinary ascites presenting as postoperative acute oliguric renal failure

Introduction

Spontaneous urinary ascites is a rare clinical entity in adults. It is nearly always provoked by underlying bladder conditions; inflammatory, malignant, or obstructive.^{1,2} We report a case of spontaneous urinary ascites after upper abdominal surgery.

Case Report

A 36-year-old woman underwent open cholecystectomy for calculus cholecystitis. Pre-operative liver function tests, renal function tests, and complete blood counts were normal. Ultrasound abdomen showed multiple stones in the gallbladder (GB), with thickened GB and urinary bladder walls. Intra-operatively the liver was normal, the GB wall was thickened with multiple stones, and there was no free fluid in the abdomen. The other visceral organs were normal. The patient underwent cholecystectomy through right subcostal incision. On the 2nd post-operative day, she developed abdominal distension, abdominal pain, fever, reduced urinary output, and tachycardia. On examination she was anxious, febrile and hemodynamically stable. Abdominal examination revealed abdominal distension with shifting dullness and diffuse tenderness. There was no pedal edema. A diagnosis of post cholecystectomy biliary peritonitis was made. Laboratory investigations showed hemoglobin 12.3 g/dL (normal 12.1–15.1 g/dL); total leucocyte count 16,000 cells/m³ (4800–10800 cells/m³). The urine examination showed 3+ proteins, and 6–8 pus cells. Her serum creatinine, and urea nitrogen were 3.2 mg/dL (normal 0.6–1.4 mg/dL), and 56 mg/dL (normal 8–25 mg/dL) respectively, and liver function test was normal. Serum electrolyte test reported sodium 130 mEq/L (135–147 mEq/L), potassium 5.9 mEq/L (3.5–4.8 mEq/L), and chloride 96 mEq/L (98–108 mEq/L). The patient had no history of liver, or kidney disease, and her pre-operative serum creatinine level was normal. Plain x-ray abdomen and chest were within normal limits. On ultrasound examination, there was significant free fluid in the abdomen, both kidneys were normal, and the bladder showed a thickened wall. The patient was suspected for post cholecystectomy bile leak and the bladder was catheterized. Laparotomy was performed. Laparotomy findings were straw-colored fluid around 3 L, not bile stained. Fluid was aspirated, and sent for analysis, culture and sensitivity. The abdomen was closed with a drain tube in situ. Biochemical analysis of the aspirated liquid revealed elevated urea 176 mg/dL, creatinine 8 mg/dL and protein 5 g/L. Culture of the fluid was positive for *Klebsiella pneumoniae*. Sodium, potassium and chloride levels in the ascitic fluid were 32, 17 and 71 mEq/L, respectively, which differed markedly from the serum electrolyte level. The ascitic fluid-serum creatinine ratio was >1.0 (i.e. 8:3.2 mg/dL). A diagnosis of urinary ascites was made. She was treated with antibiotics to prevent bacterial translocation, as per fluid culture and sensitivity. After placement of the catheter, ascites subsequently resolved, and the serum creatinine level returned to normal. Urinary ascites

secondary to cystitis was the possible cause. We performed retrograde cystography, but bladder perforation was not detected. Because the patient's condition improved, she was discharged without further complication. The urinary catheter was removed after the 14th post-operative day. She remains asymptomatic, and no sign of recurrence has been noted at 1-year follow up.

Discussion

Intraperitoneal urinary leakage is characterized by an increase in the serum creatinine level caused by reabsorption of creatinine in the urine through the peritoneal membrane, oliguria and ascites. Because most cases of intraperitoneal urinary leakage are the result of blunt trauma, leakage without obvious trauma may be misdiagnosed as acute kidney injury.^{3,4}

In adults, the causes of urinary ascites include surgical trauma, blunt injury abdomen, and post radiotherapy induced rupture. Establishing the cause of the ascites is important for planning management.⁵ Despite the presence of significant ascites in most cases, analysis of ascitic fluid for urinary constituents has been overlooked as a diagnostic aid.^{6,10} Useful information may be gained from an analysis of the ascitic fluid, because only in urinary ascites can the urea and creatinine concentrations of the ascitic fluid exceed those of the plasma. An additional point of differentiation is that in ascitic fluid analysis in other diseases the protein concentration is usually much higher.⁷ Ascites:serum creatinine ratio of > 1.0 is suggestive of intraperitoneal urinary leak.⁹ The association of anuria or oliguria, with hyponatremia, hyperkalemia and elevation of serum creatinine in addition to ascites must lead to a diagnosis of urinary ascites.¹¹ Our patient presented with precisely this complex.

The most common causes of spontaneous rupture of the urinary bladder are chronic inflammation, bladder outflow obstruction, and malignancy.¹⁴ Ruptured bladder should be suspected in an evaluation of abdominal pain, especially if the history and findings indicate a urinary tract disorder. In spite of its unique presentation, a diagnosis is usually established at laparotomy and is associated with a very high mortality rate, more than 80%.¹³ The presence of urine in the ascitic fluid may be suspected from its urea content, and confirmed by cystogram which, besides demonstrating the nature of the obstruction and its effect on the upper urinary tract, may reveal the site of the leak.⁸ Cystography has been recommended although it is usually not done prior to laparotomy.¹³

This case suggests that routine analysis of ascitic fluid for

urea, creatinine and protein, and serum electrolytes should be considered in any sudden onset ascites, especially in patients with urinary tract infection.

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