

## Nephroquiz (Section Editor: M. G. Zeier)

### A woman with ascites and oliguria

Yi-Chun Wang<sup>1</sup>, Jia-Da Lin<sup>2</sup> and Szu-Chun Hung<sup>1</sup>

<sup>1</sup>Division of Nephrology, Department of Medicine, Taipei Tzuchi Hospital, The Buddhist Tzuchi Medical Foundation, Buddhist Tzu Chi University, Taipei County, Taiwan and <sup>2</sup>Department of Urology, Taipei Tzuchi Hospital, The Buddhist Tzuchi Medical Foundation, Buddhist Tzu Chi University, Taipei County, Taiwan

Correspondence and offprint requests to: Szu-Chun Hung; E-mail: szuchun.hung@msa.hinet.net

**Keywords:** bladder rupture; pseudo-renal failure; urinary ascites

#### Case

A 49-year-old woman presented to the emergency department with abdominal fullness and oliguria for 3 days. The patient had received a hysterectomy due to uterine myoma 1 month previously. She had normal kidney function before the procedure. She also denied alcohol use or history of hepatitis. Physical examination was significant for severe abdominal distension with shifting dullness. Laboratory tests revealed azotemia and hypoalbuminemia. She had a blood urea nitrogen of 20.71 mmol/L, serum creatinine 275.81  $\mu\text{mol/L}$ , serum sodium 124 mmol/L and serum albumin 20 g/L. Urinalysis was remarkable for hematuria (occult blood 3+) and proteinuria (protein 2+). An abdominal sonography revealed much ascites with normal liver surface and echogenicity. In addition, kidney size was normal without hydronephrosis (Figure 1). Paracentesis was performed and showed turbid ascites. Owing to acute oliguric renal failure, hemodialysis was suggested. She was transferred to our hospital for further management.

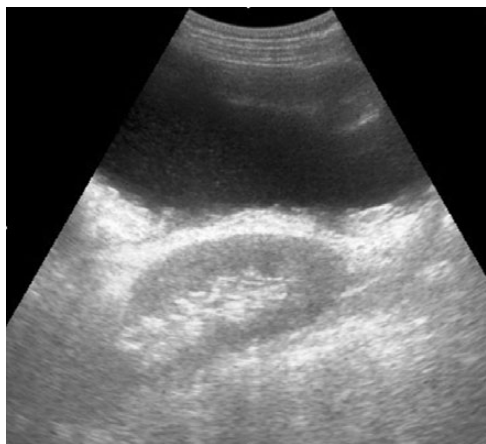


Fig. 1. Abdominal sonography showing gross ascites.

Paracentesis was performed again. Analysis of the ascites revealed a creatinine concentration of 742.56  $\mu\text{mol/L}$ . A Foley catheter was placed and she received normal saline infusion for volume replacement. Within 24 h, the flow of urine dramatically increased and serum creatinine level decreased to 53  $\mu\text{mol/L}$ .

#### Question

What is your diagnosis?

#### Answer

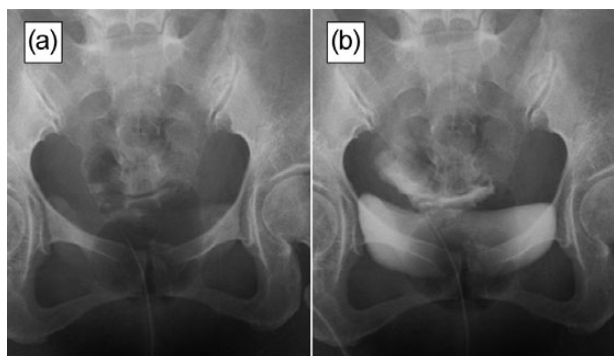
Pseudo-renal failure due to bladder rupture.

#### Discussion

Urinary bladder rupture mimicking acute kidney injury has rarely been reported in the literature. After urinary tract injury, urine with a high creatinine content leaked into the peritoneal cavity. Prolonged urine accumulation resulted in peritoneal membrane reabsorption. Therefore, urinary ascites from urinary tract injury might cause an elevation in serum creatinine. This is so-called 'pseudo-renal failure'.

In patients with liver cirrhosis, urea nitrogen and creatinine concentrations in ascites and serum are similar [1]. In this case, analysis of the ascites showed a creatinine concentration of 742.56  $\mu\text{mol/L}$ , much higher than the serum creatinine (275.81  $\mu\text{mol/L}$ ), indicating urinary ascites [2]. Reviewing her medical history and image studies, liver cirrhosis as the cause of her ascites is unlikely. Urinary ascites due to urinary tract injury during hysterectomy was highly suspected.

During admission, retrograde cystography revealed contrast leakage into the peritoneal cavity (Figure 2). The perforation site was located at the right posterosuperior urinary bladder. A urologist was consulted and the urinary bladder rupture was repaired by laparoscopy. Postoperatively, her ascites gradually resolved and serum creatinine



**Fig. 2.** Cystography showing (a) before contrast injection and (b) contrast leakage into the peritoneal cavity.

normalized. After discharge, follow-up cystography was normal and she recovered well.

Urinary bladder rupture, either spontaneous or traumatic, presents with abdominal fullness due to urinary ascites. Treatment of bladder rupture included relieving renal obstruction, treating infection and stopping urine

leakage [3]. Clinically, pseudo-renal failure associated with internal urine leakage is characterized by oliguria and azotemia and is not easy to be distinguished from true acute kidney injury. Since pseudo-renal failure could be resolved without dialysis, it is important for nephrologists to be aware of the possibility of iatrogenic urinary bladder rupture after gynecological operations.

*Conflict of interest statement.* None declared.

## References

1. Nguyen-Khac E, Thevenot T, Capron D et al. Are ascitic electrolytes usable in cirrhotic patients? Correlation of sodium, potassium, chloride, urea, and creatinine concentrations in ascitic fluid and blood. *Eur J Intern Med* 2008; 19: 613–618
2. Ridinger HA, Kavitt RT, Green JK. Urinary ascites and renal failure from unrecognized bladder rupture. *Am J Med* 2012; 125: e1–e2
3. Robards VL Jr, Haglund RV, Lubin EN et al. Treatment of rupture of the bladder. *J Urol* 1976; 116: 178–179

*Received for publication: 4.7.13; Accepted in revised form: 6.7.13*