

Iatrogenic Calyceal Rupture in Patient with Unrecognized Vesicoureteral Reflux

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INTRODUCTION

Renal calyceal rupture, which is a radiographical finding indicating perirenal urinary extravasation associated with ureteric obstruction, is a rarely encountered clinical situation in urology. There are few cases reported in the literature. Moreover, the majority of reported cases are associated with ureteric calculi.⁽¹⁾ We present a male patient, who developed an unusual complication when performing a suprapubic cystostomy.

CASE REPORT

A 60-year-old man in vegetative state due to diffuse anoxic brain injury came to our hospital for 1 week fever and hematuria. He had kept urethral catheter for 5 years and experienced similar manifestations 3 months ago. His vital signs were as follows: blood pressure, 130/75 mmHg; pulse, 84 beats per minute and regular; respirations, 20 per minute; and body temperature, 38.0°C. Blood tests showed a leukocyte count of $13.2 \times 10^9/L$ with predominant neutrophils, C-reactive protein 7.1 mg/dL, blood urea nitrogen 15 mg/dL, and serum creatinine 1.2 mg/dL. Urinalysis showed 20 to 29 red cells and 30 to 49 white cells per field under high-power magnification. Antibiotic therapy was started, and acute pyelonephritis which caused the fever was resolved.

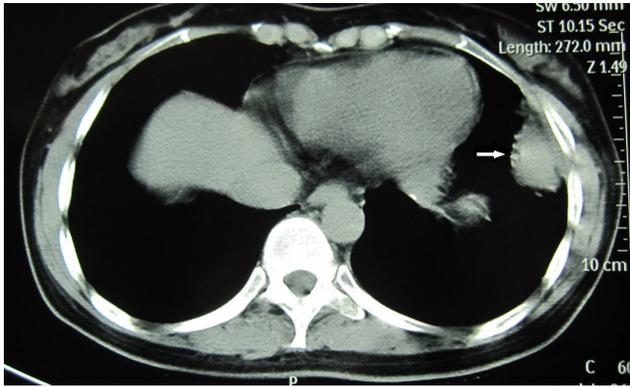


Figure 1. Cystography demonstrating reflux into the ureter and perirenal fluid collection due to calyceal rupture.

Suprapubic cystostomy was planned in order to reduce recurrent nosocomial infection. Even after filling 200 mL of normal saline into the bladder via indwelled urethral catheter, suprapubic distention was not seen. To determine the presence of bladder injury, cystography was then immediately performed. During the cystography, no perivesical leakage was identified on full bladder films, however right sided vesicoureteral reflux (VUR) and a typical fluid collection around the right kidney was recognized (Figure 1). An abdominal computed tomographic (CT) scan was performed, which showed right hydronephroureterosis, focal rupture of the right mid-renal calyceal system, hematoma formation and leakage to the retroperitoneal space (Figure 2). Indwell-



Figure 3. Contrast computed tomography axial section showing decreased perirenal hematoma and disappeared hydronephrosis.

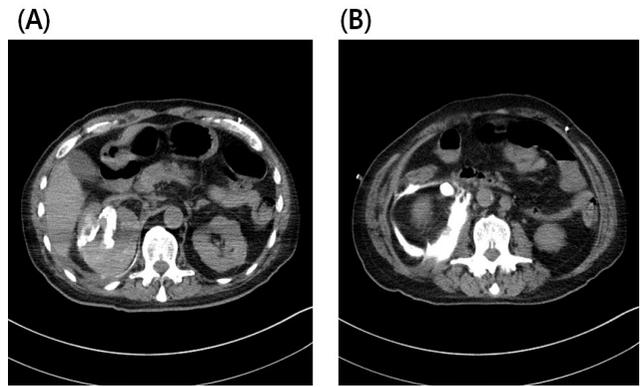


Figure 2. Noncontrast computed tomography axial section showing hydronephroureterosis, focal rupture of the right mid-renal calyceal system (A) and leakage to the retroperitoneal space (B).

ing urethral catheter was kept for 2 weeks and CT scan was performed again, which showed disappeared hydronephrosis but still remained perirenal hematoma (Figure 3).

DISCUSSION

Although published literature contains several small case reports, Gershman and colleagues⁽²⁾ reported a retrospective review of 108 patients with renal forniceal or calyceal rupture. Forniceal rupture was most commonly associated with ureteric obstruction caused by stones. The iatrogenic causes included ureteric injury after vaginal hysterectomy, occlusion of ureteric orifice by urethral catheter balloon, and prostatic occlusion by urethral catheter balloon. There was one case of calyceal rupture during instillation into the bladder, but that was because an unexpected small capacity of the bladder led the catheter to enter into the ureteral orifice in a child.⁽³⁾ Calyceal rupture leads to backflow of urine into the renal sinus, and the extravasated urine causes inflammatory reaction followed by an avascular deposition of collagen and fibrous tissue accounting for the urinoma formation.⁽⁴⁾ The treatment depends upon the condition of the patient and the residual function of the affected kidney. Placement of an indwelling ureteral stent or percutaneous catheter can relieve obstruction.⁽⁵⁾ In our case, VUR, which was the cause of calyceal rupture, was subsided after keeping a urethral catheter, and therefore we did not perform any procedures.

Suprapubic cystostomy is recommended to patients with

neurogenic bladder to prevent complications of long-term urethral catheter drainage. Complications associated with the insertion of suprapubic catheters using a punch trocar technique include perforation of the ileum as well as serious retro-pubic hemorrhage.⁽⁶⁾ It is well known that filling the bladder with normal saline before the procedure is an indispensable in order to avoid injury to bowel or blood vessel. However, there is no reported complication that we could encounter during the bladder filling. Care should be taken during bladder filling for patients in vegetative state and paraplegic state.

CONFLICTS OF INTEREST

None declared

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