

## CASE REPORT

# Urinary Retention Accompanied by Retroperitoneal Urine Leakage in Schizophrenia

Changho Lee

Department of Urology, Soonchunhyang University Cheonan Hospital, Soonchunhyang University College of Medicine, Cheonan, Korea

We presented a case of a 46-year-old man who attended the emergency department with right flank pain. Abdominal computed tomography showed dilated renal pelvis, ureter and distended bladder. Fluid collection was seen in retroperitoneal space and pelvic cavity. He had renal insufficiency. When a urethral catheter was inserted, 1,200 mL urine was drained. He was diagnosed with schizophrenia more than 20 years prior, and had been taking anti-psychotics. He had been living in a sanatorium. He had nocturnal enuresis and had worn an incontinence pad nightly for the last 10 years. His fluid consumption was 10 L/day. After placement of an indwelling urethral catheter for relieving voiding problems and restriction of fluid intake, fluid collection in retroperitoneal spaces and pelvic cavity was removed and renal insufficiency was recovered. After training of self-clean intermittent catheterization, he was discharged.

**Keywords:** Urinary retention; Schizophrenia; Polydipsia; Polyuria

## INTRODUCTION

Urinary symptoms are uncommon clinical manifestations of schizophrenia [1,2]. A few cases of schizophrenia with urinary retention have been reported in the literature. Urinary retention could be a rare clinical manifestation of schizophrenia or develop as a complication of antipsychotics [3-5]. Here, we report the case of a middle-aged male schizophrenic patient who developed urinary retention secondary to renal insufficiency and retroperitoneal urine leakage, complicated by obstructive voiding.

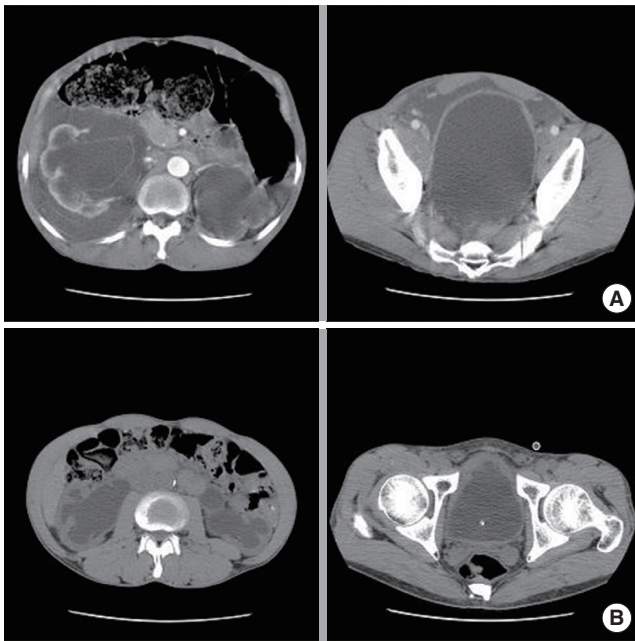
## CASE REPORT

We examined a patient who presented at the emergency department with right lower quadrant pain. The pain had begun 2 or 3 days earlier. He visited the local public medical center before arriving at the emergency department. Urinalysis, complete blood cell count (CBC) and abdominal computed tomography (CT) were performed at the public medical center. The transferred report of

urinalysis showed 10 to 20 white blood cells per high power field and CBC showed leukocytosis at  $12,700/\text{mm}^3$  of white blood cell count. His hemoglobin and hematocrit were 10.9 g/dL and 37.4%. His blood urea nitrogen (BUN)/serum creatinine (Cr) was 62.6/4.2 mg%. Blood sodium and potassium level was within normal limits at 135.0 and 5.0 mEq/L. Transferred abdominal CT showed ascites in the abdominal and pelvic cavities, and marked distension of both renal pelvis and ureters. There was distension of the urinary bladder and large amount of fluid collection in the pelvic cavity (Fig. 1). He was referred to Soonchunhyang University Cheonan Hospital with the presumptive diagnosis of ruptured appendicitis, bilateral hydronephrosis, hydroureter and renal failure. Right lower quadrant pain was of insidious onset and there were no precipitating events, alleviating or aggravating factors. He had nocturnal enuresis and wore an incontinence pad at night since 10 years prior. He had a weak stream, intermittency and dribbling. He was diagnosed with schizophrenia more than 20 years prior and had been taking psychotics including haloperidol 1.5 mg bid, benztropine 1 mg daily and chlorpromazine 50 mg daily. He had

Correspondence to: Changho Lee  
Department of Urology, Soonchunhyang University Cheonan Hospital, Soonchunhyang University College of Medicine,  
31 Suncheonhyang 6-gil, Dongnam-gu, Cheonan 330-930, Korea  
Tel: +82-41-570-3886, Fax: +82-41-574-6248, E-mail: leech@sch.ac.kr/leech@schmc.ac.kr  
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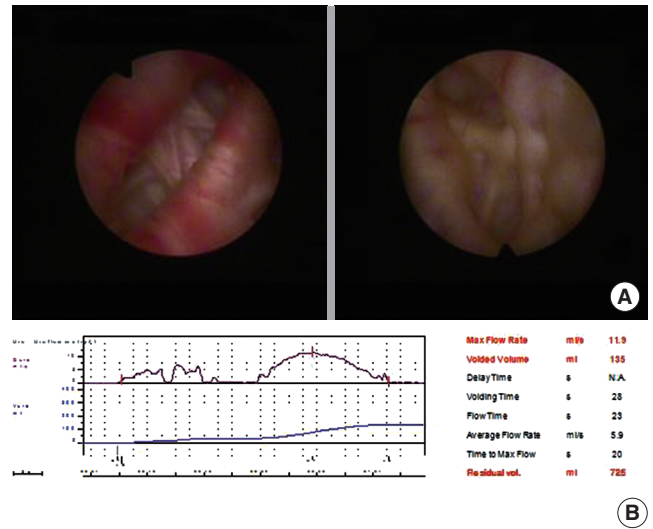


**Fig. 1.** (A) Abdominal computed tomography (CT) which was taken 3 days after right flank pain; Fluid collection was seen in retroperitoneal space and pelvic cavity. (B) Abdominal CT which was taken 6 days after indwelling urethral catheter; Even though bilateral hydronephrosis was still seen, fluid collection in retroperitoneal and pelvic cavity was completely resolved and bladder wall thickening was observed.

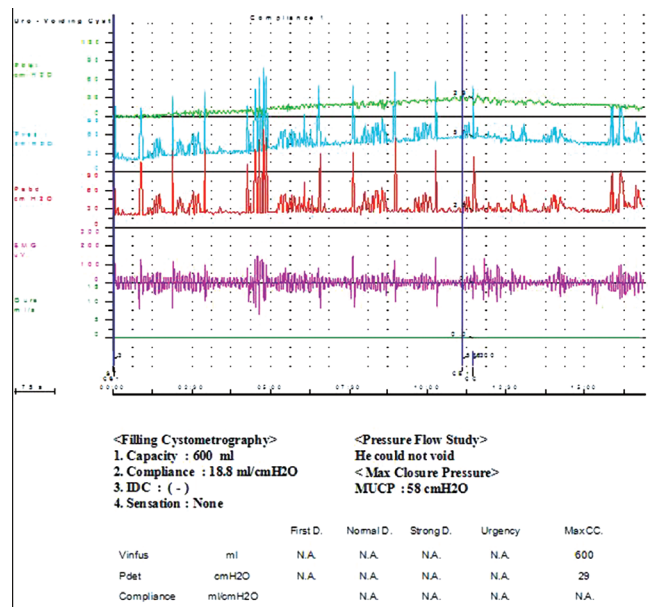
been living in a sanatorium.

During examination, his abdomen was soft and flat. Bowel sound was normoaudible. He had tenderness on both lower quadrants of the abdomen and right costovertebral angle. Findings of the physical examination were otherwise unremarkable. Catheterization was done and 1,200 mL of urine was drained. Urine test results were negative for nitrites, blood, and leukocytes. Urine culture results were also negative for bacterial infection.

We decided to maintain a urethral catheter and admitted the patient in order to monitor his clinical condition. On the second day of hospitalization, we found that his total amount of intake and output (I/O) was exceedingly high, 7,900 mL and 14,680. On the third day, his renal function was recovering with BUN/Cr at 43.3/2.3 mg%. However, he still exhibited polydipsia; his I/O is 11,100/13,550 mL. On the sixth day of hospitalization, a follow-up abdominal CT was taken. Even though bilateral hydronephrosis was still seen, fluid collection in the retroperitoneal and pelvic cavity was completely resolved and bladder wall thickening was observed (Fig. 2). On the seventh day, we performed a urethra-cystoscopic evaluation. There were no specific abnormal findings on the urethra and bladder, except for severe trabeculations (Fig. 2),



**Fig. 2.** (A) Severe trabeculations were found on cystoscopy. (B) Uroflowmetry was performed on the eighth day after hospitalization. Urethral catheter had been inserted 7 days before removal for voiding trial. Voiding volume was 135 mL and residual urine volume was 725 mL. Maximal flow rate was 11.3 mL/sec. Intermittency was seen.



**Fig. 3.** Bladder was filled by normal saline till 600 mL through 6 Fr. cystometry catheter. Up to 600 mL of infusion volume, patient did not express any bladder sensation. At that volume, his detrusor pressure was 29 cmH<sub>2</sub>O and bladder compliance was 18.8 mL/cmH<sub>2</sub>O. Urodynamic diagnosis should be absent bladder sensation, low compliance and acontractile bladder. Pdet, detrusor pressure; Pves, vesical pressure; Pabd, abdominal pressure; IDC, idiopathic detrusor contracture; MUCP, maximal urethra closure pressure; Vinrus, infusion volume; First D, first desire; Normal D, normal desire; Strong D, strong desire; MaxCC, maximal capacity.

which was compatible with obstructive voiding. On the eighth day, we attempted to allow the patient to void by himself without a

catheter. He voided 500 mL, but the remaining urine volume was 500 mL. We did uroflowmetry and measured post-void residual urine volume. Maximal flow rate was 11.9 mL/sec and voiding volume was 135 mL. But, his post-voiding residual volume was 725 mL (Fig. 2). We performed cystometry. We filled normal saline up to 600 mL. At 600 mL of infusion volume, the patient did not express any bladder sensation. At that volume, his detrusor pressure was 29 cmH<sub>2</sub>O and bladder compliance was 18.8 mL/cmH<sub>2</sub>O. His urodynamic diagnosis accordingly was absent bladder sensation, low compliance and acontractile bladder (Fig. 3). Psychiatrist in Soonchunhyang University Cheonan Hospital reported that he had good nightly sleep, daily behavior and had no evidences of acute exacerbation. Psychiatric recommendation for this patient was the maintenance of current antipsychotics. We prescribed intermittent catheterization for voiding problems and restriction of fluid intake for polyuria. On the twelfth day after admission, the interval between catheterization was 90 minutes and drained urine volume per catheterization was 300 to 450 mL, with a total urine output of 5,050 mL. He was discharged on the thirteenth day after admission.

## DISCUSSION

Polyuria in schizophrenia was first described by Hoskins and Sleeper in 1933. They reported that 92 male patients with schizophrenic disorders voided about twice as much urine per day at 2,602 mL compared to 19 normal male controls at 1,302 mL; and 55% of their patients voided more than 2,000 mL of urine daily in contrast to only 19 percent of controls who exceeded this amount [6]. Psychogenic polydipsia was described in 20 psychotic patients. Patients drank 7 to 43 L of water daily and patients had hyponatremia at 98 to 124 mEq/L of blood sodium level. They reported that 2 deaths may also be attributed to this hyponatremia [7]. In the current case, since the patient drank more than 10 L of water daily, he should be considered to have psychogenic polydipsia, however, he fortunately did not have the serious complication of hyponatremia. Polydipsia in these cases is likely to be associated with repetitive behaviors of psychosis due to dopamine dysregulation [8,9]. Behavioral intervention of restricted fluid intake was suggested as an effective way for polydipsia and polyuria [3,10].

Voiding dysfunction and urinary incontinence were suggested as uncommon clinical manifestations of schizophrenia [1,2]. Among 10 referred cases of schizophrenia, 4 patients showed de-

trusor hyperreflexia (DH) in urodynamic observation [1]. Incontinence was more prevalent in schizophrenic patients than in a comparison group of mood disorder patients [2]. Based on these observations, it could be hypothesized that many schizophrenic patients had brain abnormalities similar to those associated with urgency incontinence and DH, in neurological patients [2].

A few cases of schizophrenia with urinary retention have been reported in the literature [3-5]. Risperidone and ziprasidone were described as atypical antipsychotics inducing urinary retention [4,5]. Among typical antipsychotics, haloperidol has weak acetylcholine muscarinic antagonist and moderate  $\alpha$ 1-adrenergic blocker activity. Theoretically, haloperidol can induce urinary retention; in fact there has been a report of urinary retention associated with haloperidol, in which normal bladder function returned on discontinuation of haloperidol therapy [11]. The presented patient had been taking haloperidol; it thus may have been a cause of urinary retention. Unfortunately we could not confirm this possibility. We did not attempt changing haloperidol to other antipsychotics, since we complied with the psychiatrist opinion to maintain the current antipsychotics. Haloperidol remained a possible cause for urinary retention in the presented case.

Urinary retention was reported as a rare clinical manifestation of schizophrenia in several case reports [3,12,13]. Shiloh et al. [13] analyzed their case and suggested that enhanced psychotic symptoms were associated with the acute, transient and severe urinary retention. They assumed that urinary retention in schizophrenic patients might be the end-result of various psychosis-related mechanisms. Currently, there are no reasonable theories to explain the pathogenesis of impaired urination in schizophrenia. Psychosomatic retention of urine would be the result of either absolute disregard of the sensory stimuli, or their blockage from reaching the awareness area, or by activation, at the cortical or subcortical level, of the inhibitory impulses toward the target organ. A combined form of both is also theoretically possible [14]. The presented patient did not express any bladder sensation until 600 mL of bladder volume and 18.8 mL/cmH<sub>2</sub>O of detrusor pressure on urodynamic observation. Even though we cannot discriminate whether this absent sensation was induced by absolute disregard of the sensory stimuli, or blockage from reaching the awareness area, this condition appeared to be the reason this patient showed renal insufficiency. A few published reports have found psychogenic urinary retention to be severe enough to cause gross structural change and consequent renal failure [12,15].

In schizophrenia with urinary retention, initial treatment must always be conservative; and irreversible surgical procedures are not indicated [16]. Intermittent catheterization is considered to be the treatment of choice, irrespective of cause and before further investigation [17]. The presented patient was discharged after training of self-clean intermittent catheterization.

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