



Massive Inguinoscrotal Hernia Associated with Acute Renal Failure Complicated Acute Pyelonephritis

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We report a 50-year-old man was brought to our Emergency Department due to fever and dyspnea for 2 days. The patient had difficulty in walking and was bed-ridden in the past 5 days due to massive right inguinoscrotal hernia. He had difficulty in micturition in the past 2 days. He was febrile with a body temperature of 39.5°C, a blood pressure of 82/50 mmHg, a pulse rate of 122 beats/minute, and a respiratory rate of 22 breaths/min. Physical examination showed left-sided costovertebral angle knocking tenderness and a large right-sided irreducible inguinoscrotal hernia. Initial laboratory examination revealed abnormalities as follows: Leukocyte counts $28.8 \times 10^3/\mu\text{L}$; procalcitonin $>200 \text{ ng/mL}$; blood urea nitrogen 77.7 mg/dL; and creatinine 10.6 mg/dL. Computed tomography (CT) of abdomen displayed a large right inguinal hernia containing small and large intestine with compression on junction of bulbous and pendulous urethra. Coronal view of CT reviewed swelling and fat stranding of left kidney which indicated acute pyelonephritis.

Key words: Acute pyelonephritis, acute renal failure, inguinoscrotal hernia

INTRODUCTION

Giant inguinoscrotal hernias are uncommon because of the availability of early elective repair.¹ As well as the usual complications of inguinoscrotal hernia, patients will encounter difficulty in walking or lying down and inability to perform routine activities of daily life. This condition is thought to be acquired and can cause acute renal failure associated with urological tract outflow obstruction combined urinary tract infection with sepsis, which has been less frequently reported. Massive inguinoscrotal hernias have been reported associated with obstructive nephropathy.² Patients who have significant symptoms attributable to a groin hernia should undergo surgical intervention as soon as possible to minimize associated complications.

CASE REPORT

A 50-year-old man was brought to our Emergency Department (ED) due to fever and dyspnea for 2 days. He was

relative healthy without any medical disease in the past. The patient had difficulty in walking and was bed-ridden in the past 5 days due to massive right inguinoscrotal hernia. He had problems with initiating micturition in the previous 2 days. No obvious symptom including nausea or vomiting was found. Physical examination showed left-sided costovertebral angle knocking tenderness and a large right-sided irreducible inguinoscrotal hernia. He was febrile with a body temperature of 39.5°C, a blood pressure of 82/50 mmHg, a pulse rate of 122 beats per minute, and a respiratory rate of 22 breaths per minute. Initial laboratory examination revealed abnormalities as follows: Leukocyte counts $28.8 \times 10^3/\mu\text{L}$; procalcitonin $>200 \text{ ng/mL}$; blood urea nitrogen 77.7 mg/dL; and creatinine 10.6 mg/dL. Urinalysis showed: White blood cells, 66–100 per high power field and leukocyte esterase 2+. Arterial blood gas assessment was reported under nasal cannula 3 L/min; pH 7.26, PaCO_2 37.2 mmHg, PaO_2 114.4 mmHg, and HCO_3^- 11.9 mmol/L [Table 1]. At ED,

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abdominal sonography revealed no evident hydronephrosis but noticeable enlargement with swelling of left kidney. Following computed tomography (CT) of abdomen displayed a large right inguinal hernia containing small and large intestine with compression on junction of bulbous and pendulous urethra [Figure 1a and b]. Coronal view of CT showed obvious swollen and fat stranding of left kidney, which indicated acute pyelonephritis [Figure 2].

An indwelling urinary catheter was inserted which drained a residual volume of urine of 1600 mL at ED. Inotropic agents and broad-spectrum antibiotics were administered under the situation of severe sepsis. After admission, he recovered gradually with progressive improvement of renal function. Initial urine culture at ED grew *Escherichia coli*. His blood urea nitrogen and creatinine stabilized at 19.7 mg/dL and 0.88 mg/dL when discharged after 12 days in hospital [Figure 3]. Three weeks after discharge, the large inguinal hernia was reducible via a successful operation.

DISCUSSION

This case is interesting because direct compression of urethra caused by massive inguinal hernia lead to obstructive nephropathy. Inguinal hernias are more often direct and can be limited to the inguinal canal or can reach the scrotum. Most cases are asymptomatic and are usually found incidentally at the time of herniorrhaphy.³ There are some reports showing that inguinal hernia of the bladder cause torsion of the trigone, besides, inguinal hernia cause obstruction of urethra. Furthermore, inguinal hernias have been reported associated with bladder hernia and obstructive nephropathy. The

incidence of bladder involvement in inguinal hernias is <4% and may reach 10% in the elderly patients.⁴

Our present case was without obvious bladder hernia and different from most reported cases. The patient had

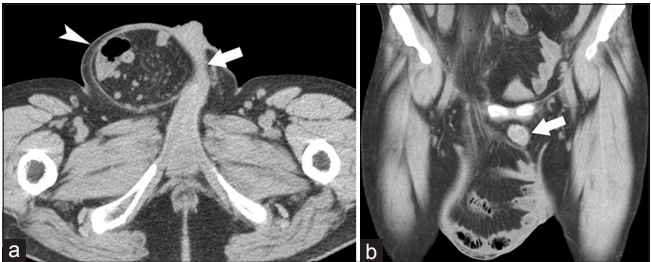


Figure 1: (a) Computed tomography of abdomen demonstrated a large right inguinal hernia containing small and large intestine (arrowhead) with indentation on junction of bulbous and pendulous urethra (arrow) (b) Coronal reformatted image revealed significant urethral compression caused by the hernia sac

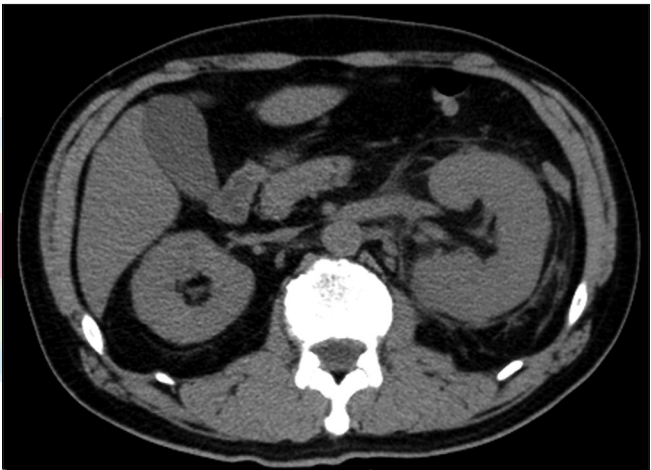


Figure 2: Coronal view of computed tomography showed obvious swollen and fat stranding of left kidney, which indicated acute pyelonephritis

Table 1: Blood biochemistry data at ED upon admission		
Parameters	ED	Normal value
Leukocyte (10 ³ /μL)	28.8	4.8-10.8
BUN (mg/dL)	77.7	6-20
Creatinine (mg/dL)	10.64	0.5-0.9
Sodium (mmol/L)	132	136-145
Potassium (mmol/L)	5.3	3.5-5.1
C-reactive protein (mg/dL)	53.3	<0.5
Procalcitonin (ng/mL)	>200	<0.05
GOT (U/L)	139.5	10-30
GPT (U/L)	59.1	2-32
Arterial pH	7.21	7.35-7.45
PaCO ₂ (mmHg)	37.2	35-45
Bicarbonate (mmol/L)	14.6	24±2
Glucose (mg/dL)	173	70-110

BUN = Blood urea nitrogen; GOT = Glutamate oxaloacetate transaminase; GPT = Glutamate pyruvate transaminase; ED = Emergency department

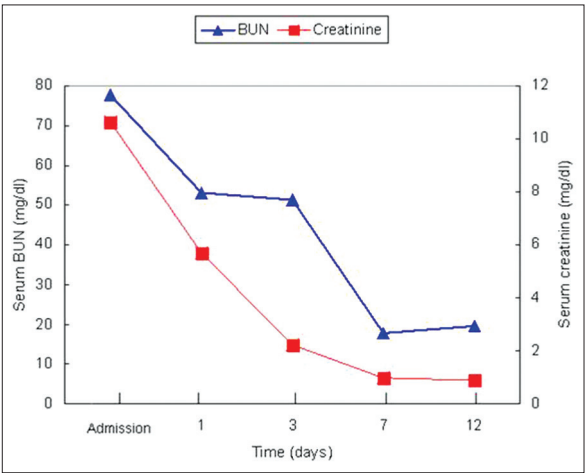


Figure 3: Series of blood urea nitrogen and creatinine levels during hospitalization

Massive inguinoscrotal hernia causing acute renal failure

difficulty in walking and was bed-ridden in the recent 5 days due to massive right inguinoscrotal hernia. Obviously, nondilated obstructive nephropathy with acute renal failure developed, therefore, signs of obstructive nephropathy such as hydronephrosis or hydroureter were not found. The mild or absent uremic symptoms (such as nausea, vomiting) with dissociated high serum creatinine was a characteristic of nondilated obstructive nephropathy, which resulted from volume depletion, low urinary flow, and insignificant time for urinary tract dilatation. Risk factors included the older age, abdominal-pelvic malignancy, carcinomatosis, and retroperitoneal fibrosis.^{5,6} However, our patient demonstrated obvious septic sign at admission. Laboratory data revealed apparent leukocytosis with high procalcitonin and C-reactive protein. Pyelonephritis may develop when pathogens ascend to the kidneys passing through the ureters. Most cases of pyelonephritis start at lower urinary tract infections, especially in the setting of urinary tract obstruction.⁷ In our case, obstruction of urethra caused by inguinoscrotal hernia may be associated with acute pyelonephritis. His condition of acute renal failure should also be precipitated by sepsis and volume depletion. The diagnosis of inguinoscrotal hernia associated nondilated obstructive nephropathy combined urinary tract infection with septic shock was made based on clinical presentation and CT findings. Of note, there was an improvement of the total renal function 12 days after the immediate urinary catheter insertion and combined empiric antibiotic therapy with adequate intravenous fluid supplement. In the case of renal deterioration due to obstruction from a large inguinoscrotal hernia, stenting of Foley catheter is of much benefit for the kidney.

If urethra obstruction is present though, patients are not asymptomatic and they mostly complain of their lower urinary tract symptoms, rather than the hernia itself. The differential diagnosis of urethra obstruction should include inguinal hernia, benign prostate hyperplasia or some form of prostatitis. With regard to the acute renal failure, the urethral obstruction may have been significant. Surgical hernia repair is the definitive treatment of choice.⁸ Management of huge inguinal hernia has existing challenges and careful planning in preoperative preparation, and postoperative monitoring is necessary for its successful repair.⁹

CONCLUSION

Massive inguinoscrotal hernia can be associated with acute renal failure complicated acute pyelonephritis. It is evident

that such serious conditions should be suspected and treated. Detailed physical examination and further image study such as CT scan can make the rapid differential diagnosis, and should be immediately performed when suspicion in clinical scenario. Early diagnosis and appropriate antibiotics therapy can reduce morbidity.

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Conflicts of interest

There are no conflicts of interest.

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