



Inflammation and infection

A rare case of double kidney stones and Emphysematous Pyelonephritis presenting with septic shock

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ABSTRACT

Kidney stones and Emphysematous Pyelonephritis with septic shocks is a critical and urgent occurrence has a high mortality rate, which needs to be paid great attention to. Early anti-infection and removal of obstruction play a key role in the treatment. This case report reviews the diagnosis and treatment of the case, discusses the disease characteristics of the disease, and shares our successful clinical experience in treating the disease.

1. Introduction

Septic shock is the worst progression of urinary tract infection, with approximately 1/10 urinary-derived septic shock associated with urinary tract obstruction.¹ Emphysematous pyelonephritis is characterized by diffuse necrosis of the renal parenchyma, parenchyma, and gas production in the renal fascia. Bilateral emphysema pyelonephritis is extremely rare, accounting for approximately 10% of emphysema pyelonephritis cases, with a high mortality rate.² Giant Staghorn calculus in both kidneys with emphysematous pyelonephritis complicated with septic shock are rarer and lead to higher mortality. This report presents the successful treatment of a critically ill patient. Based on the previous treatment experience, it is concluded that a comprehensive plan is often needed for this disease, including surgical decompression and drainage, anti-infection, anti-shock and corresponding nutritional support for comprehensive treatment.

2. Case report

A 65-year-old woman with a 2-day of fever and lumbodynia to our department. the patient had been suffering from lumbodynia and discomfort for more than 20 years without any examination and treatment. Day 6 after completing thoracic spine surgery at the local hospital, the patient had chills and fever, with a maximum temperature of 40 °C and blood pressure of 85/58mmHg. Later transferred to our hospital. The patient had previous hypertension and no history of diabetes.

Physical examination on admission: body temperature: 37.3 °C, pulse: 99 times/min, respiration: 24 times/min, blood pressure: 78/49mmHg. With a face of pain and bilateral renal area knock pain.

Routine laboratory studies revealed the following: white cell count, 22.94 (10⁹/L); hemoglobin, 68.00 (g/L); platelets, 81.00 (10⁹/L); albumin, 27.00 (g/L); sodium, 127.6 (mmol/L); creatinine, 217.00 (μg/L); C-reactive protein, 181.52 (mg/L); procalcitonin, 162.14 (ng/ml); lactic acid, 2.11 (mmol/L). CT showed effusion and accumulation of gas in both kidneys, and multiple stones in both kidneys (Figs. 1 and 2).

After admission, 1g meropenem every 8 h for anti-infection, fluid resuscitation and dopamine was pumped to correct the shock. After the condition was slightly stabilized, bilateral ureteral stenting was performed under intravenous anesthesia in the emergency department on the same day, and purulent fluid was seen flowing out of bilateral ureteral orifice under ureteroscopy. Postoperative blood pressure was still low, and fluid resuscitation (including crystals, colloid and plasma), meropenem and norepinephrine combined with dopamine was performed to correct shock (according to the regulation BP and CVP). Multidisciplinary consultations are invited to assist in diagnosis and treatment, including cardiology, infectious diseases, orthopedics, etc., Symptomatic treatments such as concentrated red blood cell and platelets input, supplementation of intravenous nutritional fluids, and maintenance of water and electrolyte balance.

No bacterial growth was found in the patient's multiple blood and urine cultures. After the body temperature is stable, the antibiotics are downgraded and the broad-spectrum ceftazidime is used. Under a comprehensive treatment plan, the patient's back pain symptoms gradually eased, and various biochemical indicators improved. Re-examination CT showed that the kidney gas accumulation was significantly reduced, and kidney stones were still present (Fig. 3). The patient recovered clinically and was discharged 10 days after admission. However, huge kidney stones still exist, and further staged treatment of

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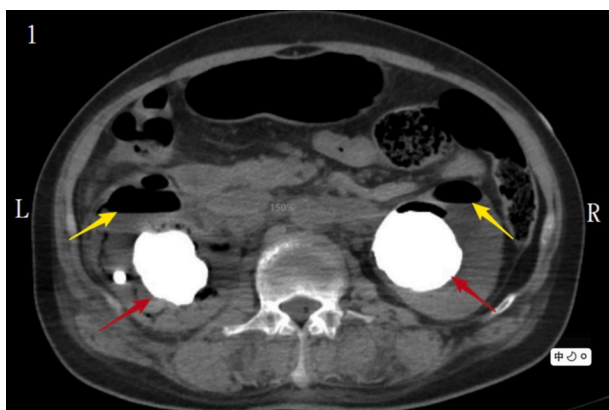


Fig. 1. Gas accumulation and stones in both kidneys.

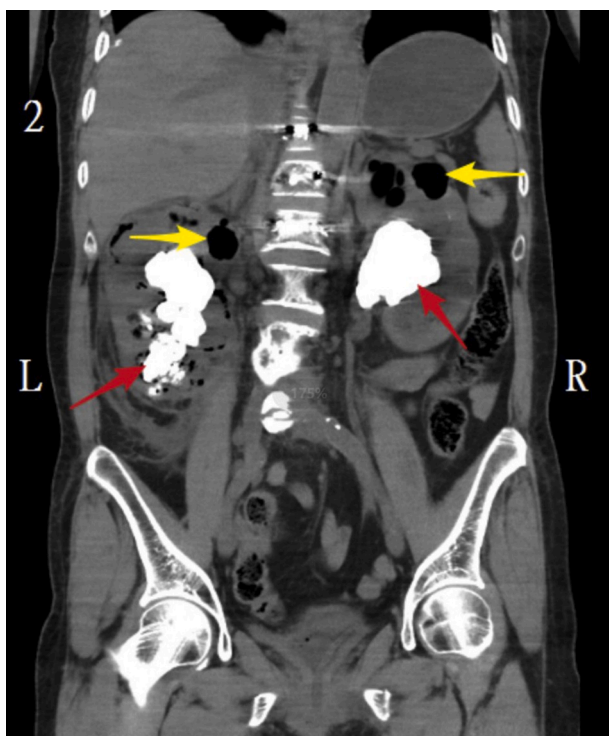


Fig. 2. The size of both kidneys increased significantly, and the parenchyma of both kidneys became thinner. Multiple stones were seen in the double pelvis, calyces, and the upper part of the right ureter, and gas accumulation in the collective system.

kidney stones is needed.

3. Discussion

Stones in the urinary system may cause urinary tract obstruction, provide favorable conditions for bacterial growth and reproduction, thereby causing urinary tract infections and triggering urinary sepsis. In addition, with age, systemic degeneration, decreased autoimmunity, and surgical stress increase the incidence of bacterial infections.³ In this case, a female patient experienced surgical trauma 1 week ago and her resistance decreased. She had a history of repeated low back pain and developed a double kidney cast stone without attention. This type of stone is mostly infectious stone. It can cause patients with difficulty in excreting urine, induce intrarenal infection, damage the patient's renal function, and cause severe septic shock, which is life-threatening.

Emphysema pyelonephritis was first proposed and named by Schultz

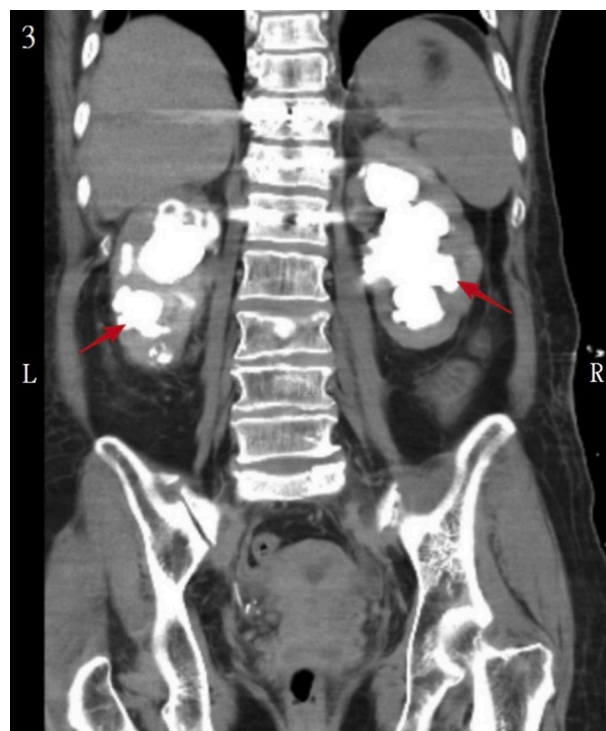


Fig. 3. Reexamination of CT renal effusion and gas accumulation were significantly reduced compared to the previous, the renal parenchyma became thinner, and the kidney stones showed typical Staghorn calculus.

and Klorfein. They pointed out that the most common pathogen of the disease is Gram-negative bacilli, mainly *Escherichia coli*, accounting for 75%, followed by *Klebsiella pneumoniae*, etc.⁴ Patients with acute kidney failure, shock, disturbance of consciousness, and thrombocytopenia often indicate a poor prognosis. The main causes are: poor blood sugar control, urinary tract obstruction, mixed urinary tract infection caused by gas-producing bacteria, and low immune function.² CT is the gold standard for diagnosing emphysema pyelonephritis, and its sensitivity is 100%. According to Huang and Tseng's classification of emphysema pyelonephritis,⁵ the patient's parenchyma in this case was grade IV with combined urinary tract obstruction, septic shock, and thrombocytopenia. Its prognosis is extremely poor. However, because the patient has been using antibiotic intervention after the operation at the local hospital, no positive bacteria were found in this case for multiple urine and blood cultures.

What is unique about this case is that the huge kidney stones with urinary sepsis combined with emphysema pyelonephritis are rare. No literature report has been found. Fortunately, we successfully treated this patient at risk. Review the entire diagnosis and treatment process of the disease, early effective fluid resuscitation, heavy hammer to fight strong anti-inflammatory, and race against time to release the obstruction (such as retrograde placement of DJ tube under ureteroscopy or percutaneous renal puncture and drainage under ultrasound guidance), reasonable and appropriate Nutrition support is the key to treatment.

4. Conclusion

Double kidney Staghorn calculus with urinary sepsis is one of the most common emergencies in urology. When combined with emphysema pyelonephritis is a fatal emergency in urology, it is effective to diagnose early, correct shock, and actively fight infection. Surgical intervention drainage is the key to the success of diagnosis and treatment. A comprehensive analysis of the patient's specific condition is carried out to develop an individualized comprehensive treatment plan.

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