Bilateral emphysematous pyelonephritis: a case presentation of successful treatment with minimally invasive procedure

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ABSTRACT

Bilateral emphysematous pyelonephritis is a rare, serious disease with a high mortality rate. It presents with greater frequency in diabetic patients with obstructive uropathy although there are other risk factors such as immunosuppression, alcoholism, cirrhosis, and kidney failure. Radiologically it is classified as: type 1, when only the collecting system is affected; type 2, when there is gas inside the renal parenchyma; type 3, which is subdivided into a) when it involves the perirenal space and b) when it involves the pararenal space; and type 4, when it affects both kidneys or a solitary kidney (10% of cases). The mortality rate is approximately 25% and medical treatment alone, bilateral involvement, thrombocytopenia, serum creatinine and urea elevation, and hypotension secondary to septic shock have been recognized as prognostic factors. The case presented here is a 52-year-old diabetic woman with serious symptoms of bilateral involvement who was successfully treated with minimally invasive procedures and medical management.

Key words: Emphysematous pyelonephritis, ureteroscopy, double-J catheter, Mexico.

RESUMEN

La pielonefritis enfisematosa bilateral es un padecimiento grave y raro, con alta mortalidad. Se presenta con mayor frecuencia en pacientes diabéticos con uropatía obstructiva, aunque existen algunos otros factores de riesgo como inmunosupresión, alcoholismo, cirrosis e insuficiencia renal. Radiológicamente se clasifican como: tipo 1, cuando afecta solo el sistema colector; tipo 2, cuando existe la presencia de gas dentro del parénquima renal; tipo 3, se subdivide en: A, cuando abarca al espacio perirrenal y B, si abarca el espacio pararrenal; y tipo 4, cuando afecta ambos riñones o en un riñón solitario (10% de los casos). La mortalidad es de alrededor de 25% y como factores pronósticos han sido reconocidos el tratamiento médico puro, la involucración bilateral, la trombocitopenia, la elevación de azúcares y la hipotensión secundaria a choque séptico. Presentamos el caso de una paciente de 52 años, diabética con un cuadro grave con afectación bilateral que fue tratada exitosamente con procedimientos minimamente invasivos y manejo médico.

Palabras clave: Pielonefritis enfisematosa, ureteroscopía, catéter doble J, México.
INTRODUCTION

Bilateral emphysematous pyelonephritis is a rare and serious disease with a high mortality rate. It presents particularly in diabetic patients and is associated with obstructive uropathy in a large number of cases. In a meta-analysis published by Falagas et al there was a 25% mortality rate with an 11-42% range in a total of 175 patients. Factors associated with higher mortality rate were medical treatment alone, bilaterality of the disease process, thrombocytopenia, systolic hypotension under 90 mmHg, serum creatinine above 2.5 mg/dL, as well as altered state of consciousness. Clinical diagnosis should be suspected in the diabetic patient that presents with severe infectious process and confirmed by means of computed tomography (CT) that will show the presence of gas, classifying it into type 1, when there is gas only inside the collecting system; type 2, when there is gas inside the renal parenchyma; type 3A, when there is gas in the perirenal space; and type 3B, when gas or abscess extends to the pararenal space. Type 4 corresponds to bilateral cases or to solitary kidney.

The most frequent causal microbe is *E. coli* followed by *Klebsiella pneumoniae*. There are reports describing patients treated exclusively with medical management in an effort to metabolically stabilize them with antibiotic therapy, even in bilateral cases, and other cases in which percutaneous drain or ureteral catheter drain was employed together with medical management, and others in which patients underwent early stage nephrectomy. Conservative management has gained ground in the last few decades, given that despite poor function found in initial studies, the renal unit can be saved in a large percentage of cases.

CASE PRESENTATION

The patient is a 52-year-old woman with type 2 diabetes of 12-year progression. Her past medical history included laparoscopic cholecystectomy in 2004. She was seen in the emergency room for the first time on March 10, 2008, with lower irritative urinary symptoms of 2-week progression that included dysuria, urinary frequency, bladder tenesmus and strain, and was treated by a general physician with phenazopyridine for five days with poor response. Patient presented with fever of five-day progression and general malaise, pain in both back flanks but predominant on right side for which she returned to emergency room where she underwent urological evaluation. Patient presented with dehydration, toxic/infectious facies, blood pressure 90/55, positive bilateral costovertebral angle percussion, and signs of peritoneal irritation. Laboratory tests reported leukocytes 19,850 with 95% neutrophils and 8 bands, and platelets 220,000. Urinalysis reported innumerable leukocytes, 20-25 erythrocytes per field, positive nitrites, and abundant bacteria. Urine culture was ordered and was positive for *E. coli*. Glycemia was 387 mg/dL, urea 82, and creatinine 2.2. Abdominal film showed presence of gas in right collecting system and atypical gas in left kidney silhouette (Figure 1). CT confirmed presence of gas in collecting system of both kidneys with dilatation of right collecting system (Figures 2, 3, and 4). Double-J catheters were placed under fluoroscopic control without incident and metabolic management, fluid replacement, and triple regimen antibiotic therapy with cefotaxime, amikacin, and metronidazole was begun. Patient progression was satisfactory. Two days later control film showed no apparent gas in collecting system (Figure 5). Patient was released after 12 days and continued to be seen as an out-patient. Control ultrasound showed no evidence of ectasia, urine culture was negative, and both catheters were removed after 4 weeks of placement.

Patient remained asymptomatic until January 2008 when pain in right back flank returned. Ultrasound revealed right ectasia. Urography study was ordered and showed stenotic zone in upper third of ureter (Figure 6).
Stenotic zone was found by means of ureteroscopy and was cut with Rite cut®. A small stone was fragmented with pneumatic lithotriptor and double-J catheter was placed and removed three months later after control ultrasound. Presently patient is asymptomatic, metabolic management is good, urinalysis is normal, urine culture is negative, and there is slight elevation of serum creatinine and urea.

**DISCUSSION**

Emphysematous pyelonephritis is a particularly serious disease in diabetic patients and is very often associated with obstructive uropathy. However, it can present in patients with no known risk factors. It is well-documented that bilateral cases present a greater therapeutic risk given that mortality rate is higher and it can cause important deterioration in kidney function requiring bilateral nephrectomy with substitutive treatment. Risk factors that should be identified early were demonstrated in a meta-analysis of seven studies with a total of 175 patients. Patients are able to be treated intensively if early risk factor identification is made, since it is known that they will increase patient mortality. Conservative management has gained ground particularly in type 1 and type 2 cases, while percutaneous drain and even nephrectomy are indicated in type 3 patients. Findings reported from nephrectomy specimens show poor perfusion, vascular thrombosis, atherosclerosis, and/or glomerulosclerosis, findings that are characteristic of diabetic patients with long-term disease progression. In the case of the patient presented here, early diagnosis and opportune intervention allowed for rapid recovery, even though
Bilateral emphysematous pyelonephritis is a rare, serious entity that presents in diabetic patients and a large percentage of cases are associated with obstructive uropathy. It requires early diagnosis and strong and opportune treatment in order to reduce mortality. This mortality depends to a large degree on associated risk factors such as type of treatment, thrombocytopenia, shock, disease bilaterality, kidney function deterioration, and alterations of state of consciousness. The patient presented here was successfully treated through endourology and complementary medical treatment.

CONCLUSIONS

The patient presented with late obstruction secondary to stenosis. That event was adequately resolved through minimally invasive procedure and patient is currently asymptomatic.

BIBLIOGRAPHY