

Emphysematous pyelonephritis in a patient with chronic pancreatitis and diabetes

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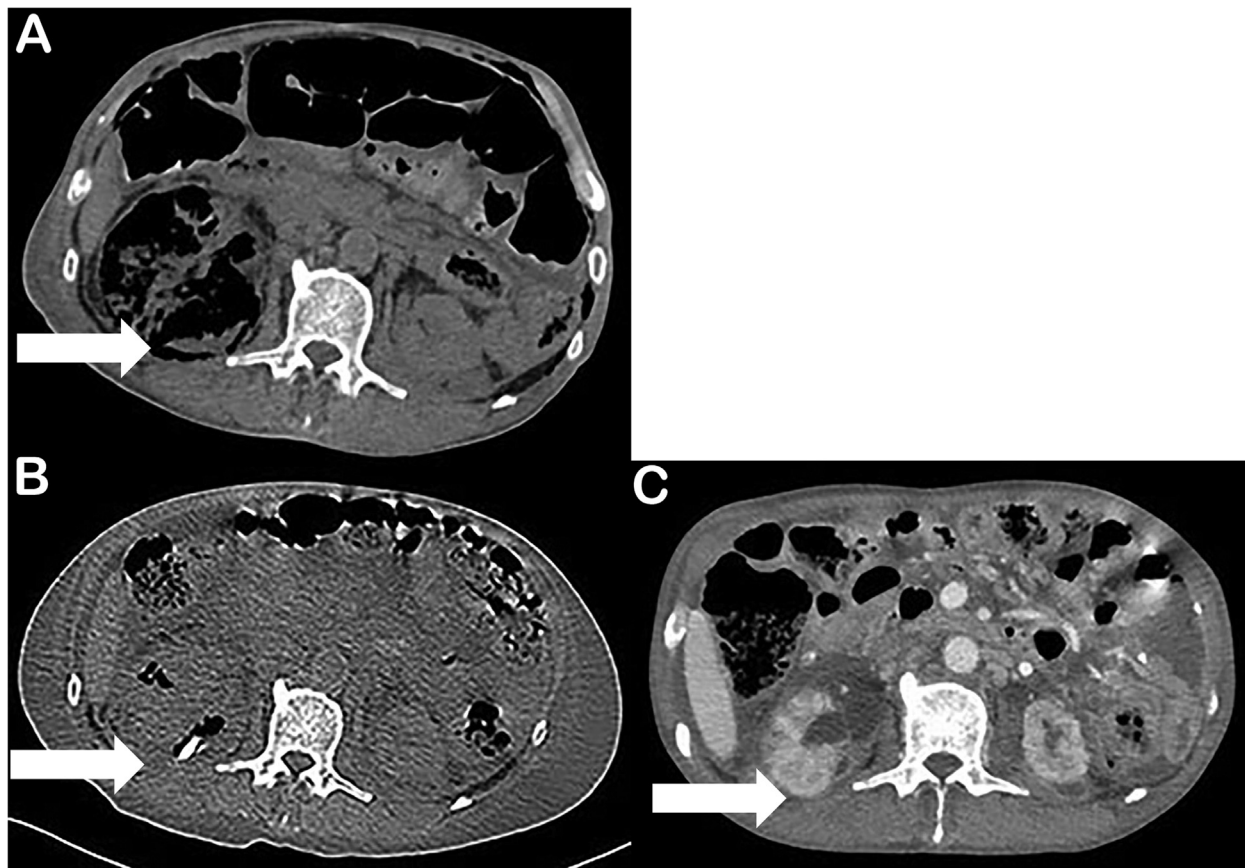


FIGURE 1.

CASE PRESENTATION

A 57-year-old man with diabetes and chronic pancreatitis presented to the emergency department with a 3-day history of tachypnea and abdominal distension. His heart rate was 120 beats per minute and blood pressure was 95/55 mmHg. Physical examination revealed tenderness in the right kidney area. Initial laboratory tests showed that the white-cell count was $33.41 \times 10^9/L$ (reference range, 3.5 to $9.5 \times 10^9/L$), serum creatinine level was 632 $\mu\text{mol/L}$ (reference range, 68 to 108 $\mu\text{mol/L}$), and blood PH level was 7.149 (reference range, 7.35 to 7.45). Glycated hemoglobin (HbA1c) value was 12.2% (Reference value: 4.5%-6.1%). A computed

tomographic (CT) scan of the abdomen showed a large area of gas in the right kidney area, ureter and bladder, a finding suggestive of emphysematous pyelonephritis (Figure A). Treatment with glycemic control, intravenous fluid, broad-spectrum antibiotics (imipenem) and continuous renal replacement therapy were initiated, and the patient was admitted to the medical intensive care unit (ICU). A percutaneous renal drain was then inserted. Blood, urine, and drainage fluid cultures grew *Escherichia coli*. Through continued treatment in the ICU, the patient's condition gradually improved, and he was discharged on the 31st day of hospitalization. After 4 and 8 weeks of drug treatment, repeat CT showed that the

renal pneumonia was gradually absorbed, and the renal parenchyma also appeared on enhanced scanning (Figure B, 4 weeks, and C, 8 weeks).

Emphysematous pyelonephritis is a rare, acute, and severe necrotizing infection of the kidney associated with a high mortality rate.¹ It is primarily caused by urinary tract infections caused by glucose-fermenting bacteria due to uncontrolled comorbidities such as diabetes mellitus, immune dysfunction, and urinary tract obstruction. *E. coli* is the most common causative bacteria in patients with emphysematous pyelonephritis, other common pathogenic bacteria include *Klebsiella pneumoniae*, *Proteus mirabilis*, *Enterococcus*, and *Pseudomonas aeruginosa*.² Historically, the mortality rate of patients with emphysematous pyelonephritis has been as high as 40%. Despite improvements in antibiotics and treatment techniques, overall mortality remains high. A recent meta-analysis of 1303 patients reported an overall mortality rate of 13% in patient with emphysematous pyelonephritis. Importantly, this study found that patients treated with minimally invasive intervention, medical therapy alone and emergency nephrectomy had mortality rates of 9.9%, 14.7% and 33.3%, respectively.³ Given that studies have found that emergency nephrectomy is

associated with a high risk of mortality, conservative and minimally invasive treatment should be the initial management strategy for emphysematous pyelonephritis.³

FUNDING

This work was supported by the 1.3.5 project for disciplines of excellence, West China Hospital, Sichuan University.

DECLARATION OF COMPETING INTEREST

We declare no competing interests.

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