

# Abdominal Pain and Fever in an Elderly Patient with Diabetes Mellitus

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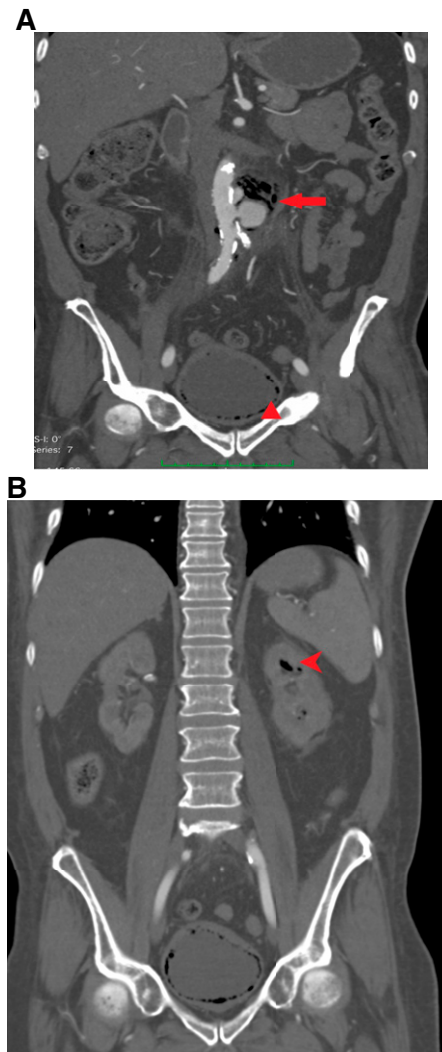
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## Case Description

A 62-year-old man presented to the emergency department with a 5-day history of severe abdominal pain with low-grade fever. Medical history included diabetes mellitus and hypertension. He had tachycardia, hypotension, and diffuse abdominal tenderness. Investigations showed white blood cell counts of 22,400/mm<sup>3</sup> (4000–10,000/mm<sup>3</sup>), blood urea of 180 mg/dl (9–43 mg/dl), creatinine of 1.8 mg/dl (0.66–1.25 mg/dl), and procalcitonin of 180 ng/ml (<0.5 ng/ml). Urinalysis showed plenty of white blood cells and red blood cells on microscopy. Contrast-enhanced computed tomography scans showed multiple air bubbles in the bladder wall, suggestive of emphysematous cystitis (EC) (Figure 1A), with tracking of the gas in the pelvicalyceal system of the left kidney (Figure 1B). Two ill-defined saccular outpouchings arising from the lateral wall of the infrarenal aorta, with retroperitoneal air bubbles suggestive of mycotic aneurysms, were also noted (Figure 1A). A left ureteric double-J stent and urethral catheter were inserted and the patient was administered intravenous meropenem. Urine and blood cultures grew *Escherichia coli* (>100,000 colonies) sensitive to carbapenems. The patient developed worsening sepsis, which was complicated by severe kidney injury, and was started on continuous RRT. The patient eventually died due to septic shock.

## Discussion

EC is a rare form of complicated urinary tract infection, characterized by gas within the bladder wall and lumen. The infection can ascend to the kidney, with the gas spreading into the pelvicalyceal system or into the renal parenchyma, which is known as emphysematous pyelonephritis, as seen in this case. Advanced age, poorly controlled diabetes mellitus, and urinary stasis are the associated risk factors. *E. coli* (60%) and *Klebsiella pneumoniae* (10%–20%) are the most common organisms isolated from urine cultures. Other organisms include *Enterobacter aerogenes*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Enterococcus faecalis*, *Candida* spp., and *Clostridium* spp. (1). Patients present with abdominal pain, fever, hematuria, and pneumaturia. The diagnosis is confirmed by the finding of gas in the bladder wall by ultrasound and computed



**Figure 1. | Emphysematous cystitis with tracking of gas to pelvicalyceal system of the left kidney.** (A) Coronal postcontrast computed tomography image showing extensive intramural air in the urinary bladder, suggestive of emphysematous cystitis (arrowhead). There are two ill-defined saccular outpouchings arising from the lateral wall of the infrarenal aorta, with retroperitoneal air specks suggestive of mycotic aneurysms (arrow). (B) Coronal postcontrast computed tomography image showing emphysematous cystitis, with tracking of the gas in the pelvicalyceal system of the left kidney (arrowhead) and perinephric fat stranding.

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tomography scans of the kidneys, ureters, and bladder. Treatment consists of early bladder drainage with the initiation of antibiotics, guided by urine culture and good glycemic control (2,3). Rarely, surgical intervention in the form of cystectomy (partial/total) is required. Bacteremic seeding can lead to emphysematous aortitis with mycotic aneurysms. The mortality associated with emphysematous aortitis is 50%–100% if unoperated (4).

### Teaching Points

- A high index of suspicion is necessary for the early diagnosis of EC.
- Diagnostic imaging modalities like ultrasound and computed tomography can identify the emphysematous process in the bladder and kidney.
- Early initiation of antibiotics and bladder drainage can be lifesaving.

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### Author Contributions

J. Ashtekar and P. Khetan reviewed and edited the manuscript; J. Ashtekar, P. Khetan, and V. Ramteke conceptualized the study and were responsible for resources; P. Khetan and V. Ramteke wrote the original draft and were responsible for data curation; and V. Ramteke was responsible for formal analysis, investigation, methodology, supervision, and visualization.

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