



Case illustrated

Simultaneous occurrence of hypermucoviscous *Klebsiella pneumoniae* emphysematous prostatic abscess, emphysematous cystitis, and renal abscess

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ABSTRACT

Emphysematous prostatic abscess is a rare clinical entity of uncomplicated urinary tract infections with high mortality rate. Here we report a case of hypermucoviscous *Klebsiella pneumoniae* causing emphysematous prostatic abscess, emphysematous cystitis, and renal abscess simultaneously in a 75-year-old Japanese male with diabetes mellitus and advanced gastric cancer. The patient was successfully treated with prolonged intravenous antimicrobial agents.

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A 75-year-old Japanese male was referred to our hospital with a 2-day history of high fever (39 °C). His medical history was remarkable for dementia treated at home. An examination revealed his blood pressure, heart rate, and respiratory rate as 80/56 mmHg, 130 bpm, and 25/min, respectively. Laboratory findings were as follows: white blood cell count, 32,000/μL (neutrophils, 96%); blood urea nitrogen, 56.9 mg/dL; creatinine, 3.71 mg/dL; blood glucose, 367 mg/dL; HbA1c, 7.3%; and pyuria on urinalysis.

Abdominal radiography revealed abnormal gas accumulation in the prostate area (Fig. 1A). Whole-body computed tomography (CT) revealed emphysematous prostatic abscess (EPA), emphysematous cystitis, and renal abscess simultaneously (Fig. 1B–D), but no liver abscesses. Accordingly, meropenem was administered empirically, and intravenous fluid therapy and intensive glycemic control with insulin were initiated. Subsequently, urine and blood cultures revealed *Klebsiella pneumoniae*, which was positive for the string test (Fig. 2). The isolate was serotype K1, and the polymerase

chain reaction detected virulence genes *magA* and *rmpA*. Hence, the patient was diagnosed with hypermucoviscous *K. pneumoniae* (hvKP) urosepsis; EPA, emphysematous cystitis, and renal abscess. We deescalated the antimicrobial to ceftriaxone. Eventually, the patient was diagnosed with advanced gastric cancer at our hospital. After 8-week antimicrobial therapy, radiographic findings and his condition gradually improved. Later, he was transferred to another hospital for rehabilitation.

Emphysematous urinary tract infections (UTIs) are rare clinical entities. In particular, EPA is a rare and serious condition of complicated UTIs characterized by gas formation and abscess in the prostate gland [1]; some studies have reported the EPA-related mortality rate to be 20%–25% [1,2]. Reportedly, EPA is more frequently observed in patients with diabetes mellitus, and the most common pathogen is *K. pneumoniae* [1,2].

HvKP has been increasingly acknowledged as the hypervirulent strain causing invasive liver abscess syndrome spreading worldwide [3]. A recent case report suggested considering the possibility of invasive hvKP infection, even in patients with UTIs [4]. In our case, EPA, emphysematous cystitis, and renal abscess due to hvKP were present.

In conclusion, we suggest considering EPA as a differential diagnosis when hvKP is isolated from diabetic patients with UTIs. Furthermore, CT should be performed for the early diagnosis and suitable treatment if EPA is suspected.

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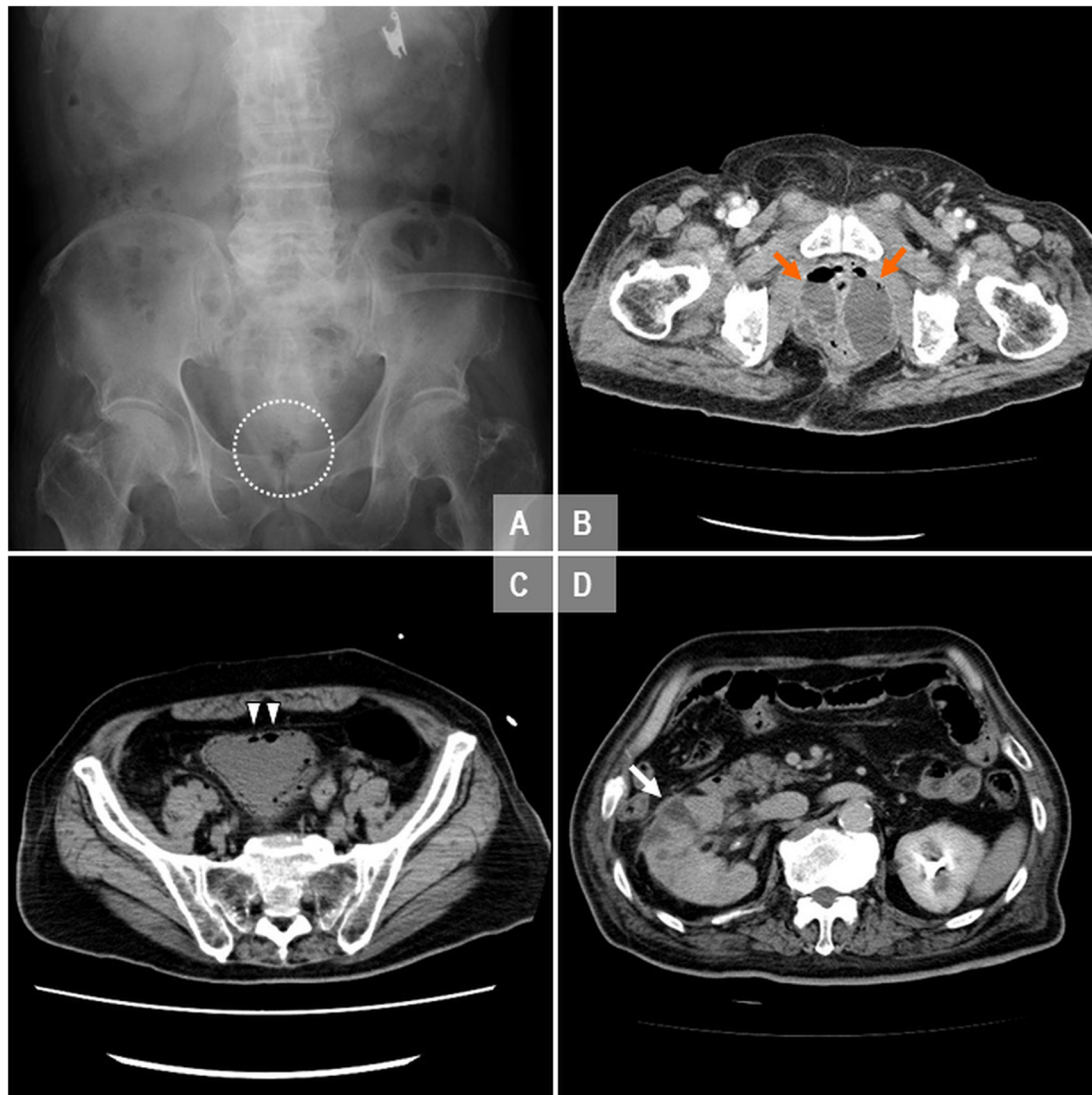


Fig. 1. A, Abdominal radiography revealing abnormal gas in the prostate area (circle). B, contrast-enhanced pelvic computed tomography (CT) revealing swelling of the prostate with gas and fluid accumulation (arrows). C, non-contrast pelvic CT revealing diffuse abnormal gas within the bladder wall (arrowheads). D, contrast-enhanced abdominal CT revealing fluid accumulation in the right kidney (arrow).

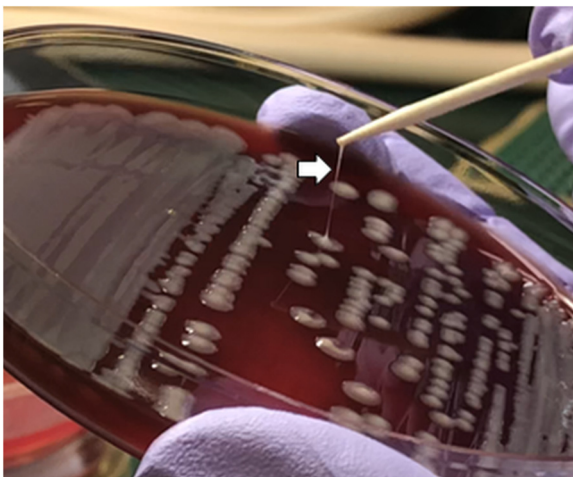


Fig. 2. The string test of *Klebsiella pneumoniae* was positive because the colonies on the agar plate resulted in the formation of a viscous string of >5 mm in length stretched by the pick (arrow).

Declarations of interest

None.

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Consent

Written informed consent was obtained from the patient's family for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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