

Emphysematous Prostatic Abscess Due to *Klebsiella pneumoniae* : Report of a Case And Review of the Literature

Emphysematous prostatic abscess is a very rare form of prostatitis. Emphysematous prostatic abscess due to *Klebsiella pneumoniae* may have a poor prognosis according to a few previous reports. We report a rare case of successfully treated emphysematous prostatic abscess with cystitis due to *Klebsiella pneumoniae* in a 50-yr-old man with 15-yr history of diabetes mellitus. The patient was referred to the emergency room of our hospital. The KUB film revealed gas shadows in the lower pelvic area suggestive of emphysematous cystitis or emphysematous prostatic abscess. The gas was mainly occupying the prostate and was also seen in the bladder on pelvic CT. The patient was successfully treated with long-term antibiotic use and additional percutaneous drainage of the abscess. Emphysematous prostatic abscess may be misdiagnosed as emphysematous cystitis due to the similar location of gas shadows on radiography. Computerized tomography and transrectal ultrasonography are helpful in making the diagnosis of emphysematous prostatic abscess. Appropriate use of effective antibiotics with drainage of pus is the best treatment. This case emphasizes the importance of timely and accurate diagnosis followed by appropriate treatment in emphysematous prostatic abscess in diabetic patients.

Key Words : Prostatitis; Abscess; *Klebsiella pneumoniae*; Diabetes Mellitus

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INTRODUCTION

Emphysematous prostatic abscess is a rare inflammatory condition of the prostate, characterized by localized collection of gas and purulent exudates in the prostate gland. A few cases of prostatic abscess with emphysematous change have previously been reported (1-4). Only two patients with emphysematous prostatic abscess due to *Klebsiella pneumoniae* have been reported, but both patients died of sepsis despite the treatment (1, 3).

Emphysematous cystitis is a disease of generally favorable prognosis which is treated promptly by use of systemic antibiotics. But the treatment of emphysematous prostatic abscess should include drainage of abscess in addition to appropriate antibiotics. The mortality rate reported about prostatic abscess varies between 1 and 16% (5). So the early differentiation between emphysematous cystitis and emphysematous prostatic abscess is important in regard to indicating the proper treatment and outcome of the patient.

We report a case of emphysematous prostatic abscess with cystitis due to *K. pneumoniae* in a diabetic patient, which was successfully treated by antibiotics and percutaneous drainage of abscess.

CASE REPORT

A 50-yr-old man was referred to the emergency room of our

hospital under the impression of emphysematous cystitis. He had difficulties in urination for the past several months. Two weeks before, he had visited a local hospital complaining of frequency, dysuria, and mild febrile sensation for one week. He was treated with an intravenous antibiotic (pefloxacin) under the diagnosis of emphysematous cystitis by plain abdomen film and pelvic ultrasound. Twelve days later he was transferred to our hospital due to a poor response to antibiotic treatment. His past medical history was remarkable for diabetes mellitus for 15 yr with poorly controlled blood sugar during the recent 3 yr.

On initial physical examination at our hospital, blood pressure was 90/60 mmHg, pulse rate 110/min, and body temperature 37.8°C. He looked acutely ill and suprapubic and perineal tenderness was checked. A uniformly enlarged prostate with heatness was palpated and a Foley catheter was inserted and kept in place.

Laboratory tests showed a white blood cell count of 17,900/ μ L, erythrocyte sedimentation rate 116 mm/hr, C-reactive protein 11.6 mg/dL, hematocrit 28.3%, platelet 265,000/ μ L, blood urea nitrogen 22.8 mg/dL, serum creatinine 1.0 mg/dL, total protein 5.5 mg/dL, serum albumin 2.6 mg/dL, serum sodium 130 mmol/L, serum potassium 3.2 mmol/L, and random blood glucose 383 mg/dL. Many red blood cells and white blood cells were seen on high power field examination of urinary sediment. *K. pneumoniae* was isolated from the culture of catheterized urine.



Fig. 1. Plain film of the kidney, ureter, and bladder shows gas shadows in the prostate area.

The KUB film revealed gaseous shadows in the lower pelvic area suggestive of emphysematous cystitis or emphysematous prostatic abscess (Fig. 1). CT scan of the pelvis showed gas and abscess formation in the prostate and urinary bladder. The gas was mainly occupying the prostate and was also seen in the bladder (Fig. 2). A wedge-shaped low density lesion, also compatible with acute pyelonephritis, was seen in the left kidney. Transrectal ultrasound confirmed the presence of gas and abscess in the prostate. The patient was administered with a combination of antibiotics (ceftriaxone, metronidazole, and aztreonam) for broad spectrum antimicrobial coverage including Gram-negative rods and possible anaerobes under the diagnosis of emphysematous prostatic abscess with cystitis. Insulin was used for strict control of blood sugar. Percutaneous drainage of pus using a pigtail catheter by perineal approach was done and about 120 mL of pus was aspirated initially. However, the cultures of drained pus were sterile. The pigtail catheter was kept in place with a daily drainage of about 10-15 mL/day. On follow-up abscessograms done at about 2-week intervals and pelvic CT scans checked on day 14 and day 28, the size of the abscess cavity in the prostate gland showed a very slow improvement and so intravenous ceftriaxone was continued. On day 23, the patient complained of pain in the Foley catheterization site in the urethra, which necessitated cystostomy. After a sufficient duration of antibiotic treatment (intravenous ceftriaxone 2.0 g/day for 6 weeks, oral metronidazole 1.5 g/day for 6 weeks, and aztreonam 1.5 g/day for 1 week), neither fever nor suprapubic pain was documented, but mild perineal pain persisted especially on defecation. Antibiotics were then changed to oral ciprofloxacin 1.5 g/day and oral metronidazole 1.5 g/day. On day 65, there was neither pain

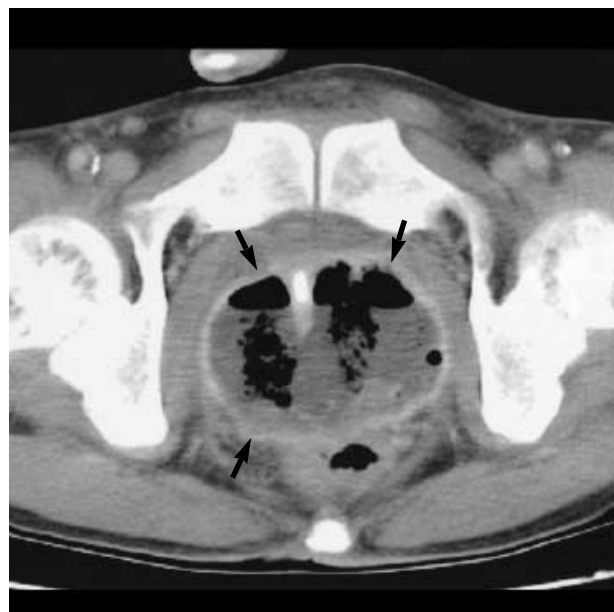


Fig. 2. Pelvic CT reveals an enlarged prostate with a low attenuating, well-defined lesion consistent with gas and abscess formation (arrows).

in the perineum nor other inflammatory symptoms or signs, so the patient was discharged. Four days later, the percutaneous drainage catheter was removed. The suprapubic cystostomy catheter was removed 3 months after its insertion. One month after removal of the suprapubic cystostomy catheter, the patient remained free of any urinary difficulty or inflammatory symptoms.

DISCUSSION

Prostatic abscess is an uncommon but potentially serious disorder with a mortality rate of 6 to 30% before the advent of effective antibiotics therapy (6). The etiologic bacterial flora of prostatic abscess were mainly *Neisseria gonorrhoeae* and *Staphylococcus* species. before antibiotics era (7). Since the development of effective antibiotics therapy, two etiologic patterns have emerged. The first pattern is primary abscess in elderly patients with underlying lower genitourinary tract disease and Gram-negative bacterial infection. The majority of patients present during the fifth and sixth decades of life with predisposing factors such as diabetes mellitus, infravesical obstruction, and bladder catheterization (5, 7). The second pattern is metastatic abscess to the prostate from a septic focus elsewhere. This group is characterized by Gram-positive bacterial infection, often caused by *Staphylococcus aureus*, and an equal age distribution (7, 8). At present Gram-negative rods associated with urinary tract infection is dominant (7). List of all anaerobes can also cause prostatic abscess (9).

Emphysematous prostatic abscess is a very rare form of prostatitis and characterized by gas formation and purulent exu-

dates collection in the prostate gland. Prior to computerized tomography scan of the abdomen, confirmation of gas in the genitourinary tract by plain radiography film was difficult because of the air shadows in the adjacent bowel. In addition, emphysematous prostatitis may be misdiagnosed as emphysematous cystitis due to the similar position of gas shadows on radiography films. Gas in body tissues is usually associated with the presence of anaerobic infection. But Gram-negative facultative anaerobes can also produce gas by fermenting glucose in necrotic tissues. The reported etiologic microorganisms in gas-forming infections of the genitourinary tract include *Escherichia coli*, *Klebsiella* species, *Proteus mirabilis*, *Citrobacter* species, and yeasts (10). In the present case we can assume that *K. pneumoniae* cultured on from the initial urine specimen had produced the gas in the prostate and bladder (10). The reported etiologic microorganisms of emphysematous prostatic abscess include *K. pneumoniae* (1, 3), *Pseudomonas aeruginosa* (2), *Bacteroides fragilis* (2), and *Candida albicans* (4).

Patients with diabetes mellitus have a high incidence of bacteriuria (11). Diabetes mellitus with urinary tract infections and ureteral obstruction can be predisposing factors leading to gas-forming infections of the genitourinary tract (10). And we can assume that diabetes mellitus in this case may also be an important risk factor of emphysematous prostatic abscess as previous two cases of emphysematous prostatic abscess due to *K. pneumoniae* (1, 3). And other reported underlying diseases of emphysematous prostatic abscess include alcoholic liver cirrhosis and benign prostatic hypertrophy (1).

Because the presenting symptoms of emphysematous prostatitis are non-specific, the patients are usually treated as having a simple urinary tract infection. Thus the diagnosis should be based on clinical history, rectal examination, and imaging modalities such as ultrasound and CT scan (5, 12, 13). Transrectal ultrasound should be performed on any patient in whom a diagnosis of prostatic abscess is suspected (14).

Procedures of pus drainage in prostatic abscess include transurethral drainage (9), transurethral resection (2), perineal incision (15), and transperineal prostatic puncture (15, 16). If there is no contraindication, transurethral drainage is an ideal method for adequate drainage with a minimal risk of bacteremia or sepsis (5). Transurethral resection is useful but there is increased risk of sepsis. Perineal incision and transperineal prostatic puncture are also described as treatment. The latter technique can be performed with the patients under local anesthesia under digital or transrectal ultrasound guidance. It is recommended in older patients in emergency situations such as sepsis and with elevated anesthetic risk (5).

Indeed appropriate antibiotics and percutaneous transperineal drainage were applied in the present case, and the patient recovered.

Complications of prostatic abscess include spontaneous rupture into the urethra, perineum, bladder, or rectum, chronic

prostatitis, infertility and sepsis secondary either to a late diagnosis or inadequate drainage of abscess (5).

In summary, emphysematous prostatic abscess is an uncommon but relatively serious infectious disease that may cause complications if not diagnosed at an early stage and treated appropriately. Clinical suspicion and differential diagnosis of emphysematous cystitis that has similar clinical feature but quite favorable outcome are required in the diagnosis of emphysematous prostatic abscess. CT scan and transrectal ultrasound may help in making this difficult diagnosis. For treatment, appropriate use of antibiotics with adequate drainage is most effective.

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