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Case Report

Emphysematous Cystitis: An Unusual Lower Urinary Tract Infection

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ABSTRACT

Emphysematous cystitis is a rare disease caused by gas-forming bacterial and fungal pathogens. It complicates urinary tract infections, especially in diabetic patients. Because clinical symptoms are not specific, the diagnosis is often made incidentally on radiography. We report the case of a 34-year-old woman who presented with fever, frequency, urgency and gross hematuria. CT scan of the pelvis revealed emphysematous cystitis which resolved after antibiotic treatment and bladder drainage.

Key Words: Emphysematous cystitis, urinary tract infection, gas-forming bacteria.

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INTRODUCTION

Emphysematous cystitis is an uncommon but severe type of infection of the urinary bladder caused by gas-forming organisms[1]. A high index of suspicion, especially in susceptible patients, is needed[1]. Plain radiography of the pelvis and computed tomography (CT) scan have been useful methods for diagnosing this condition[2]. We report the case of a young female patient who presented with fever, lower urinary tract symptoms and hematuria and was found to have *Escherichia coli* emphysematous cystitis that resolved with antibiotic treatment and bladder drainage.

CASE REPORT

A 34-year-old female patient, mother of two children, was admitted to the emergency department with fever and hematuria. Five days prior to admission she had noted increased urinary frequency, urgency and a burning sensation during micturition. Her past medical history was unremarkable.

On physical examination her rectal temperature was 38,4°C, pulse 82, and blood pressure 120/72 mmHg. Cardiac and pulmonary examinations were unremarkable. Her abdomen was soft but there was suprapubic tenderness on palpation. Gynecologic examination revealed no anomaly.

Laboratory evaluation revealed a white cell count of 15 400 cells/mm^3, hemoglobin 12,4 g/dl, sodium 130 mmol/l, potassium 4,3 mmol/l, serum urea 3,1 mmol/l, creatinine 73,8 micromol/l and fasting blood sugar 0,9 g/l. The urine contained 5 x 10^4 leucocytes/mm^3 with *Escherichia coli* on direct examination; culture showed multiple colony forming units/ml of *Escherichia coli*.

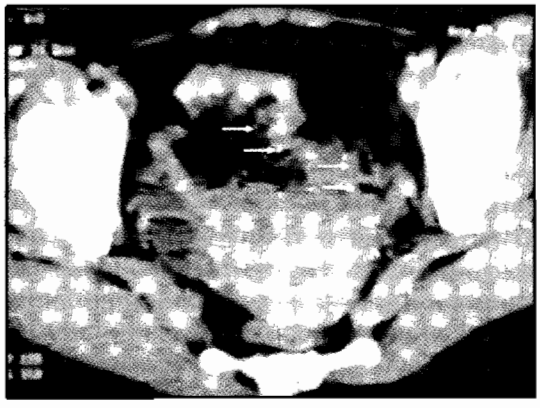

Fig. 1: Diffuse thickening and gas in the bladder lumen and around the bladder wall (arrows)

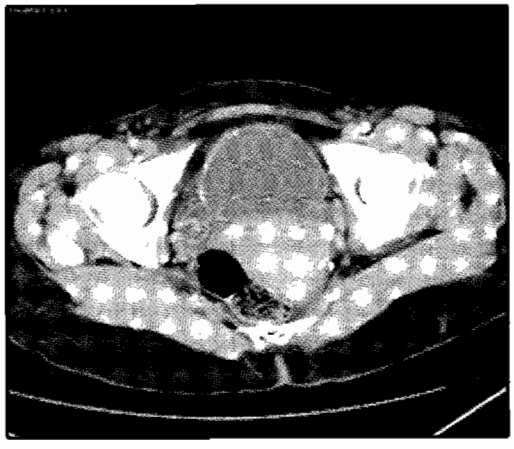

Fig. 2: CT scan after treatment showing complete disappearance of the intramural gas in the bladder wall.

Plain abdominal X-rays were negative. Abdomino-pelvic ultrasonography was unremarkable. CT scan of the pelvis revealed gas in the lumen and around the bladder wall, as well as diffuse thickening of the bladder wall and the parametria (Fig. 1). Cystoscopy showed the bladder mucosa to be hyperemic. The diagnosis of emphysematous cystitis was made. A Foley catheter was inserted. The pre-treatment sonogram revealed no anomaly.

The patient was initially given intravenous ceftriaxone and gentamycin for 6 days and the therapy was then changed to ciprofloxacin and metronidazole for 5 weeks. The patient did very well, improving rapidly on the antibiotics, and was discharged from hospital on day 8. One month after treatment, CT scan of the pelvis showed complete regression of the intramural gas in the bladder wall (Fig. 2).

DISCUSSION

Emphysematous cystitis is a rare entity characterized by pockets of gas in and around the bladder wall produced by bacterial or fungal fermentation[3]. Women are affected twice as often as men[3]. Emphysematous cystitis complicates urinary tract infection (UTI), especially in diabetic patients (50% of cases)[4], and it is often associated with an immunocompromised state (e.g. in transplant recipients), previous recurrent UTIs, urinary stasis and neurogenic bladder[1]. The patients may describe lower urinary tract symptoms, such as frequency, dysuria, gross hematuria and lower abdominal pain. Rarely, patients may experience pneumaturia or palpable gas (crepitus) in tissues in the flank or groin[4].

The diagnosis is difficult because the symptoms are usually mild and non-specific and it is often made incidentally on radiography[4,5]. On abdominal plain radiography the bladder may be seen to contain intramural air or an air fluid level[6]. If plain films are negative, as in our case, a CT scan can show gas in the bladder wall (Fig. 1).

Emphysematous cystitis requires aggressive treatment with broad-spectrum parenteral antibiotics, bladder drainage via a urethral catheter[1], and control of the causal process, such as hyperglycemia if present[7]. Rarely, if an abscess develops outside the bladder, surgical debridement and drainage are necessary[1].

Delayed diagnosis may lead to an unfavorable outcome, including overwhelming infection, extension to the ureters and renal parenchyma, bladder rupture and death[1]. However, when diagnosed promptly and treated properly, emphysematous cystitis has a favorable prognosis[4].

In conclusion, emphysematous cystitis is an uncommon disease and its diagnosis is

often difficult. The presence of gas within the urinary bladder wall is diagnostic. Treatment should include wide-spectrum intravenous antibiotics, bladder drainage and control of the causal process.

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