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Emphysematous Cystitis- A Case Report

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ABSTRACT

Emphysematous cystitis is a rare type of infection of the urinary bladder wall by gas-forming bacteria or fungi. The most frequent offending organism is *E.Coli.* other gram-negative bacteria including *Klebsiella* and *proteus* are also been reported as causative organisms. *Citrobacter* and *Enterococci* have also been found to cause emphysematous cystitis (1). Although it is a rare type of bladder infection, it is the most common type of all gas-forming bladder infections (2). The condition is characterized by the formation of air bubbles in and around the bladder wall. The gas found in the bladder consists of nitrogen, hydrogen, oxygen, and carbon dioxide. The disease most commonly affects elderly diabetic and immunocompromised patients (3). The first case was identified in a post mortem examination in 1888(4). We report a case of a 51-year-old male who presented with fever with lower abdominal pain.

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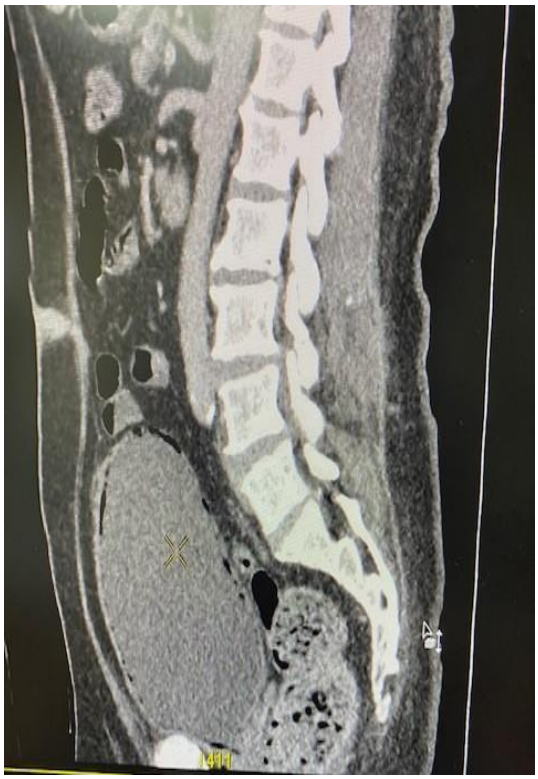
INTRODUCTION

Emphysematous cystitis is more common in women 2:1 (F: M). Risk factors include catheter use and chronic urinary tract infections, being female, diabetes mellitus, neurogenic bladder, and being in an immunocompromised state (5). In 50% of cases, patients are elderly and diabetic. Obstruction of the urinary tract as well as urinary stasis, often brought on by paralysis of the urinary tract, are also major risk factors in addition to diabetes (6). Transplant recipients have also been found to be at risk (5).

Case report:

A 51-year-old male patient presented with lower abdominal pain, fever, and bladder outlet obstruction symptoms at the accident and emergency department of Suri Seri Begawan Hospital at Kuala Belait, Brunei. No history of nausea, vomiting. On his examination there was tenderness at the suprapubic area, no guarding, and bowel sounds were positive. He was diabetic and had a history of laminoforaminotomy. He was admitted and advised to do computed tomography for the abdomen and routine blood and urine tests.

CT scan was done and findings were – the urinary bladder was distended and the wall was mildly thickened. Air was seen within the urinary bladder. No calculus or mass lesion was seen. The prostate was normal in size and parenchymal density was homogeneous. Kidneys were normal and had no hydronephrosis. The diagnosis was emphysematous cystitis. Blood tests showed high C-reactive protein, high WBC, low RBC, and hemoglobin. Urine analysis showed leukocytes 25K+, RBC-+++, bacteria ++. The patient was treated conservatively and discharged after three days.



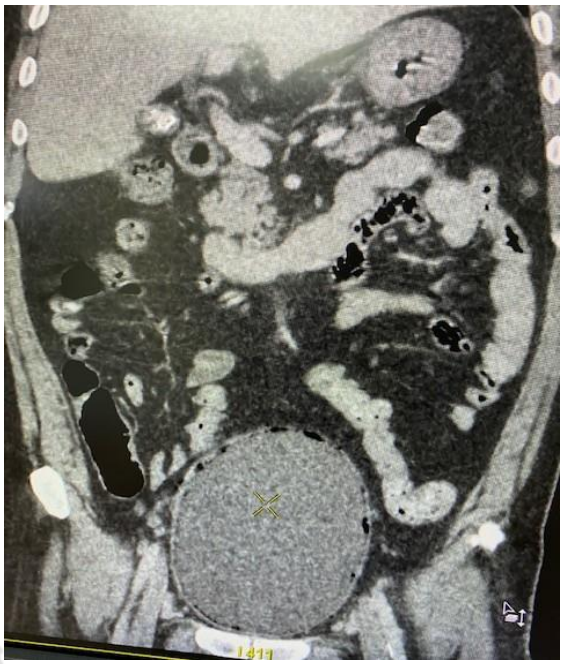


Figure A -Sagittal CT Scan Figure B- Coronal CT scan

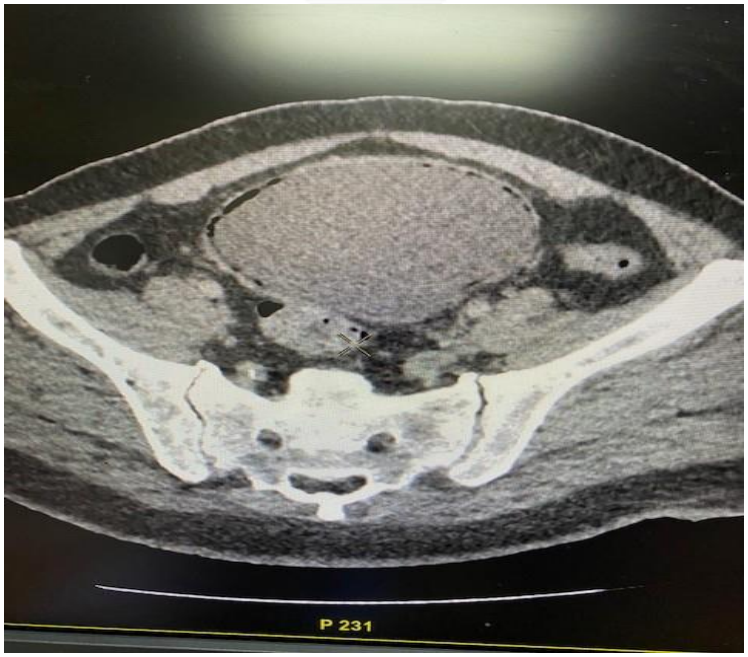


Figure C- Axial CT scan- showing intramural and intraluminal gas in the urinary bladder.

DISCUSSION

Emphysematous cystitis is a rare entity characterized by pockets of gas in and around the bladder wall produced by bacterial or fungal fermentation (7,8). Patients may complain of irritative symptoms, abdominal discomfort, or pneumaturia. A history of pneumaturia is highly suggestive but is rarely offered by the patient. As occurred in our case and several cases in the literature, the clinical features were inconclusive or unhelpful (9-12). The radiographic findings provided the first and only diagnostic clue. The disease is often associated with female sex, immunocompromised state, diabetes mellitus, previous recurrent urinary tract infections, urinary stasis, neurogenic bladder, and transplant recipients (13). Therefore, in susceptible patients, with the above risk factors along with signs and symptoms of urinary tract infection, the index of suspicion for this entity should be high. The mechanism by which gas appears in the wall of the bladder may involve either transluminal dissection of gas or true infection of the bladder wall with pathogens.

Diagnostic entities associated with gas in the genitourinary tract include emphysematous pyelonephritis, emphysematous pyelitis, and gas-forming renal abscess. Patients with emphysematous cystitis are not as acutely ill as those with pyelonephritis and pyelitis. An abdominopelvic CT scan can further delineate the extent of the disease. It is important to differentiate emphysematous cystitis from emphysematous pyelonephritis, in which gas involves the renal parenchyma since the latter has increased mortality and generally requires nephrectomy. In contrast, surgical intervention is rarely needed in emphysematous cystitis except when an anatomical abnormality like an obstruction or stone is present (14). The source of this gas within the urinary tract is from infection, trauma, vesicoureteric fistulas from radiation therapy, rectal carcinoma, diverticular disease or Crohn’s disease, and iatrogenic causes, such as diagnostic or surgical instrumentation. History, physical exam, and imaging are the best modalities to differentiate the above etiologic causes. Fistulous tracts, an abscess can be excluded on a CT scan.

Ultrasonographic findings in emphysematous cystitis with gas in the wall include a hyperechoic stripe with reverberation artifact in the superficial urinary bladder wall, while accumulation of gas immediately deep to the superficial urinary bladder mucosa with character characteristic

reverberation/ ring down artifact is seen. Scanning of the patient in both recumbent and standing positions can help to differentiate movable, gravity-dependent calculi and hematomas from adherent mass or to differentiate in the bladder lumen from intramural.

Emphysematous cystitis requires aggressive treatment with parenteral antibiotics and bladder drainage (15). Delayed diagnosis may lead to unfavorable outcomes including overwhelming infection, extension to ureters and renal parenchyma, bladder rupture, and death. Improved outcomes may be achieved by early recognition of the infection, by clinical and radiological assessment, and by appropriate antibiotic therapy.

CONCLUSION

An emphysematous cystitis is a rare form of UTI. Due to the high mortality rate for the complication of emphysematous cystitis like emphysematous pyelonephritis, prompt diagnosis is necessary and can improve the outcome. CT scan is the recommended imaging modality of choice for the early and accurate diagnosis of emphysematous cystitis. No significant clinical features strongly suggestive of emphysematous cystitis, hence it could be assumed that every patient presenting UTI signs, even mildly and with a history of diabetes or other risks factors, should be evaluated radiographically (CT scan/ ultrasound). Although this disease is rare, it merits careful attention, especially in diabetic patients.

CONFLICT OF INTEREST: None.

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