

Atypical emphysematous cystitis complicated by septic shock: A case report

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World Journal of Advanced Research and Reviews, 2024, 23(01), 1147–1149

Publication history: Received on 21 May 2024; revised on 11 July 2024; accepted on 14 July 2024

Article DOI: <https://doi.org/10.30574/wjarr.2024.23.1.1975>

Abstract

Emphysematous cystitis is a severe acute inflammation of the bladder characterized by the production of gas, mainly caused by infection with *E. coli* and *Klebsiella pneumoniae*.

It is primarily found in older diabetic females.

Clinical presentation varies widely, and confirmation is typically obtained through radiology.

Treatment involves prolonged antibiotic therapy and bladder drainage.

The prognosis varies from patient to patient.

Keywords: Emphysematous; Cystitis; Shock; Male

1. Introduction

Emphysematous cystitis is an acute, rare, and serious form of cystitis, primarily found in elderly women with diabetes, characterized by the presence of gas in the bladder.

Clinical presentation varies from one patient to another and can range from asymptomatic to septic shock.

Diagnostic confirmation is primarily achieved through imaging, especially a CT scan.

Here, we present the case of a non-diabetic male patient who developed septic shock originating from a urinary source.

2. Case Presentation

Mr. BC, aged 90, was admitted to the intensive care unit for septic shock, likely originating from a urinary source, on postoperative day 5 following a gamma nail osteosynthesis for a left pertrochanteric fracture.

In the patient's medical history, severe mitral insufficiency, valvular heart failure, atrial fibrillation, and bilateral inguinal hernia were identified. The patient presented to the emergency department due to a pertrochanteric fracture

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resulting from a mechanical fall at home. Upon admission, a catheter was inserted due to difficulty in urination without an identified bladder globe.

Taken to the operating room, the catheter was removed postoperatively. Subsequently, the patient developed dysuria with burning during urination. A recatheterization was performed. In the following course, the patient experienced chills and a fever of 38.7°C, accompanied by confusion and hypotension. An elevated lactate level of 3.9 necessitated transfer to the intensive care unit.

Upon admission, the patient's blood pressure was 70/50 mmHg, heart rate 120 bpm, and unresponsive to fluid resuscitation. The Glasgow Coma Scale (GCS) was 13, oxygen saturation was 92% on 4L of oxygen. The abdomen was painful but the patient was eupneic in room air. Abdominal pain persisted with preserved diuresis.

In the laboratory results, hemoglobin was 10.7 g/dL, white blood cell count was 27,000/mm³, creatinine was 176 μmol/L, and urea was 16 mmol/L.

An abdominopelvic CT scan showed



Figure 1 Axial section of an abdominal CT scan showing the presence of gas in the bladder, consistent with emphysematous cystitis

Antibiotic therapy consisting of tazocillin + amikacin was initiated, followed by a switch to tienam after 48 hours due to hemodynamic deterioration.

The urine culture (ECBU) and blood cultures were positive for *E. coli* with a low-level penicillinase resistance to tazocillin, sensitive to amikacin. The treatment was switched to cefotaxime, and metronidazole was added.

A significantly favorable progression with clinical improvement was observed. The patient is no longer in shock, showing hemodynamic stability and biological improvement. The patient has been transferred to the medical ward for further management.

3. Discussion

Emphysematous cystitis is a rare condition that complicates urinary tract infections. In the literature, the average age of onset for this condition is 70 years [1]. The main predisposing factors include uncontrolled diabetes, bladder urinary

stasis (neurogenic bladder, prostatic hypertrophy), malnutrition, immunosuppression, and chronic urinary tract infection. However, diabetes remains the primary predisposing factor and is implicated in 60% of cases [2,3]. The clinical presentation of emphysematous cystitis is often nonspecific, with pain reported in 80% of cases and irritative bladder signs in 50% of cases. It is asymptomatic in 7% of cases [4]. In elderly patients, clinical examination is often altered. Reactive tachycardia may be absent. Fever is inconsistent despite an advanced infectious pathology. Abdominal guarding is often absent [5]. The most frequently implicated organisms are Gram-negative bacilli, including *Escherichia coli* (60%), but *Klebsiella pneumoniae*, *Proteus mirabilis* or *vulgaris*, *Aerobacter aerogenes*, and *Candida albicans* have also been reported [7]. Anaerobic bacteria are exceptional in this pathology. Gas formation results from glucose fermentation into formic acid, then into carbon dioxide and hydrogen under the combined action of acidic urinary pH, glycosuria, and certain bacteria [8]. Abdominopelvic CT scan is the imaging of choice: it establishes the positive diagnosis (presence of air in the bladder lumen and wall), assesses the extension of gas collections, and investigates associated renal involvement [6]. It also helps rule out differential diagnoses, such as primary pneumaturia and communication with hollow organs such as vesicodigestive or vesicovaginal fistulas [4]. Treatment is mostly medical, involving broad-spectrum intravenous antibiotic therapy initially combined with bladder drainage through the placement of a indwelling catheter. The duration of treatment is poorly defined and depends on clinical response [6, 1]. It is generally 3 to 6 weeks. Surgical treatment may be necessary in case of unfavorable evolution with necrotizing involvement, where total or partial cystectomy may be considered.

4. Conclusion

Emphysematous cystitis is a condition rarely encountered by urologists, with diabetes remaining the primary predisposing factor. Abdominopelvic CT scan is the imaging of choice, and management involves bladder drainage combined with dual antibiotic therapy.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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