

Class 4 emphysematous pyelonephritis with emphysematous cystitis: a rare case report

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ABSTRACT

Class 4 emphysematous pyelonephritis with emphysematous cystitis is an uncommon diagnosis. We report a case of class 4 emphysematous pyelonephritis with emphysematous cystitis, occurring in a young Bangladeshi diabetic lady, who presented with features of upper urinary tract infection and the diagnosis of emphysematous pyelonephritis was confirmed by computed tomography scan. She was treated conservatively.

Key words: diabetes mellitus, emphysematous cystitis, emphysematous pyelonephritis.

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INTRODUCTION

Emphysematous pyelonephritis (EPN) is an uncommon, acute and severe form of necrotizing infection affecting the renal parenchyma, collecting system and surrounding tissues and the hallmark feature is accumulation of gas within these structures. Clinical presentation mimics acute pyelonephritis and gas can be identified by imaging studies; computed tomography (CT) scan being the most efficient modality.¹ Huang and Tseng² described CT based classes of EPN, class 4 is characterized by involvement of both the kidneys or the solitary kidney. Here, we report case history of a young diabetic lady with class 4 EPN with emphysematous cystitis.

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CASE REPORT

A 46-year-old Bangladeshi female, known case of type 2 diabetes mellitus for 3 years, presented with one-week history of fever, increased urinary frequency, bilateral loin pain and occasional vomiting. She suffered urinary tract infections twice in preceding 6 months and did not have any history of prior genitourinary intervention.

She was febrile (temp. 102°F), dehydrated and anaemic. She had tachycardia (pulse 102/min) and low blood pressure (90/60 mm Hg). There was renal angle tenderness bilaterally. Random blood glucose was 21.5 mmol/L and there was no ketonuria.

She was anaemic (Hb 9.6 g/dL), had neutrophilic leucocytosis (total white cells 23,860/cmm of blood, neutrophils 89.8%), high erythrocyte sedimentation rate (72 mm/in 1st hr) and C-reactive protein (126 mg/L, ref. value <6). She had high blood urea (65 mg/dL) and serum creatinine (2.7 mg/dL) and low serum sodium (128 mmol/L), bicarbonate (18 mmol/L) and albumin (28.6 g/L). HbA1c remained at 7.8%. Urine routine examination showed pyuria with plenty of pus cells/high power field (HPF), haematuria (red cells 3–8/HPF), glycosuria (++) and proteinuria (+). Blood and urine samples were sent for culture and sensitivity tests. Non-contrast abdominal CT scan showed bilateral (class 4) EPN and emphysematous cystitis (Figures 1, 2). Urine culture revealed growth of extended spectrum beta-lactamase producing *Escherichia coli*, while the blood culture revealed no growth.

After receiving the urine culture report, her antibiotic was changed from ceftazidime to meropenem (dose adjusted for kidney function) and other supportive measures were continued including fluid resuscitation, insulin, blood transfusion and indwelling catheterization. With these measures, she improved without requiring any surgical or invasive interventions.



Figure 1. Computed tomography scan (coronal section) showing bilateral emphysematous pyelonephritis

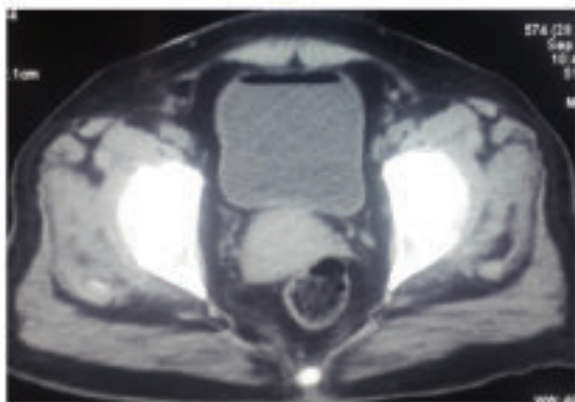


Figure 2. Computed tomography scan axial film showing emphysematous cystitis

DISCUSSION

In 1898, Kelly and MacCallum were the first to report a case of gas-forming renal infection.³ The term ‘emphysematous pyelonephritis’ was adopted by Schultz and Klorfein in 1962.⁴ Risk factors for EPN include diabetes mellitus, immunosuppressed status, renal stone and obstruction in urinary flow.^{2,5} Clinical

presentation is like acute pyelonephritis; pneumaturia is characteristic but a rare feature and may occur in fistulas communicating the genitourinary tract with the gut.

Neutrophilic leucocytosis is common⁵ and imaging can identify cases, with CT scan being the most efficient. Culture of urine, blood and pus (if aspirated/operated) may reveal the infective agent.^{2,5} There are four radiological classes (Huang & Tseng).² Most common is class 2; class 4 is the least common (<10%).⁵ Only a few cases of bilateral EPN with emphysematous cystitis are reported in literature.⁶⁻⁹

Treatment of EPN has been shifted towards a more conservative approach from nephrectomy over the previous decades. In a retrospective study, nephrectomy was required in several class 3 EPN cases.⁵ Class 4 EPN with emphysematous cystitis treated conservatively has been reported in literature.⁹

Aggressive resuscitation, use of intravenous broad spectrum antibiotics, rapid and good glycaemic control, minimally invasive interventional procedures and overall, multidisciplinary team approach have contributed to this improved outcome.

Authors’ contribution: RMB, TAC, MAA, MAR, SI managed the case. RMU drafted the manuscript. MAR did literature search and revised the manuscript. All authors read and approved the final manuscript for submission.

Consent: Informed written consent was taken from the patient for publication of this case report and any accompanying images.

Conflicts of interest: Nothing to declare.

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