

Case Report

Emphysematous Pyelonephritis and Obstructive Uropathy: Case Report

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Abstract

Emphysematous pyelonephritis is increasingly becoming a common presentation in patients with underlying diabetes mellitus. It is being considered a common cause of sepsis in this subgroup of patients if left untreated. We present a case of an elderly gentleman with reasonable control of blood glucose levels and obstructive uropathy who presented to us in sepsis and clinical evaluation revealed emphysematous pyelonephritis. Imaging studies revealed extensive air collection extending up to the thigh and scrotum. He underwent an emergency right DJ stenting and percutaneous drainage of the perinephric abscess. He improved without any further surgical intervention. This case highlights the role of obstructive uropathy as an underlying cause for the development of emphysematous pyelonephritis.

Keywords: Emphysematous; Obstructive Uropathy; Pyelonephritis

Introduction

Emphysematous pyelonephritis is a severe necrotising infection of the renal parenchyma by gas producing gram negative bacteria. It is often a complication acute pyelonephritis in patients with diabetes mellitus, mostly women. [1,2]. However, it is also a manifestation in patients with obstructive uropathy [3]. We present a case of emphysematous pyelonephritis where not only diabetes mellitus, but the presence of obstruction in the renal collecting system played an important role in the clinical presentation.

Case Report

A 72-year-old male a known case of Type 2 diabetes mellitus, hypertension and chronic kidney disease on conservative management presented to us with high grade fever with chills, abdominal pain, vomiting, reduced urine output and drowsiness of 3 days duration. He was a known case of chronic kidney disease on conservative management. 6 months back he was admitted with similar symptoms at a different hospital and was told to have urinary tract infection then. His CT scan of the abdomen then revealed an upper ureteric stricture of the left kidney and shrunken hydronephrotic right kidney Figure 1a.



Figure 1a: Left hydronephrotic kidney with upper ureteric stricture and right hydronephrotic kidney.

His bladder was grossly thick walled and shrunken (Figure 1b).



Figure 1b: Grossly thick walled and shrunken bladder.

He was managed successfully with antibiotics and temporary haemodialysis. After that his serum creatinine hovered around 4-4.5 mg/dl and was managed conservatively. A diagnosis of genitourinary tuberculosis was made, and he took ant tuberculous therapy for 6 months. At our hospital he was found to be febrile, hypotensive and in altered sensorium His abdominal examination

revealed extensive crepitus over the right flank, inguinal region and scrotum. His initial laboratory investigations are detailed in (Table 1).

Investigation	Result	Reference Range
Hemoglobin (gm %)	8.1	13-17
Total Leucocyte Count (cells/cu mm)	14880	4000-11000
Platelet Count (lakhs/cumm)	4.2	1.5 to 4.1
ESR (mm)	112	0-15
PT (s)	18.7	16-Nov
INR	1.65	
APTT(s)	34.5	26-40
RBS (mg/dl)	98	< 200
Sr. Creatinine (mg/dl)	5.5	0.52-1.04
Blood Urea (mg/dl)	90	15-36
Serum Potassium (mmol/l)	4.8	3.5-5.1
Serum Sodium (mmol/l)	139	137-145
Serum calcium (mg/dl)	8	8.4-10.2
Serum phosphorus (mg/dl)	7.6	2.5-4.5
Serum uric acid (mg/dl)	9.2	2.5-6.2
Bilirubin (mg/dl)	0.8	0.2-1.3
Alkaline Phosphatase (IU/L)	265	38-126
Aspartate aminotransferase (AST) (IU/L)	20	9-52
Alalnine aminotransferase(ALT) (IU/L)	19	14-36
Total Protein (gm/dl)	5.4	6.3-8.5
Albumin	2	3.5-5.1
Globulin	3.4	2.3-3.5
Urine Culture	Significant growth of ESBL E. coli sensitive to Carbapenems, Colistin and Polymyxin B	
Blood Culture	ESBL E. coli sensitive to Carbapenems, Colistin and Polymyxin B	

Table 1: Initial Laboratory Findings.

His blood glucose control was reasonable, and he was not on any antidiabetic medications. His computed tomography of the abdomen showed a right perinephric collection and air in the right renal pole (Figure 2).

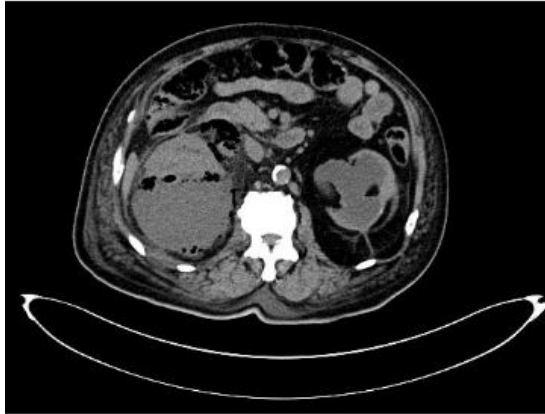


Figure 2: Right posterior perinephric collection with air pockets. Air in ureter, periureteric and in anterior perinephric space.

The air in the right kidney extended upto the retroperitoneal space, anterior abdominal wall, scrotal sac and the soft tissues of the right thigh (Figure 3).

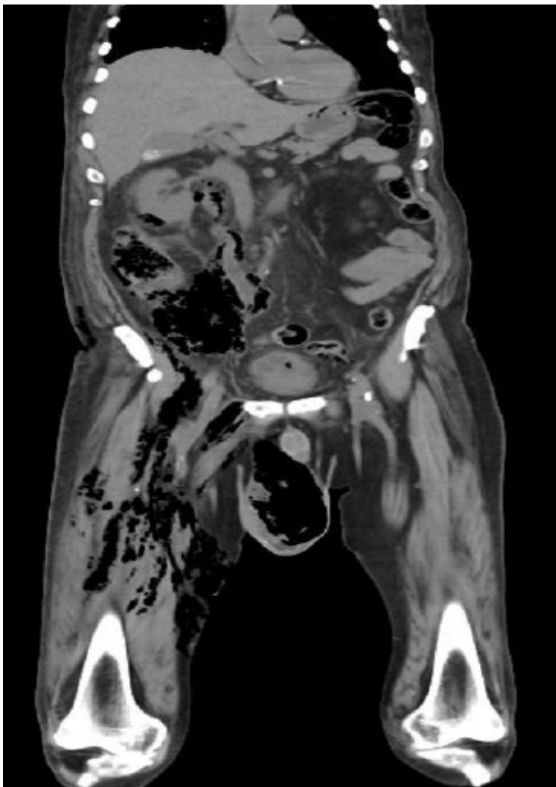


Figure 3: Air in right perinephric space, retroperitoneum air, air in anterior abdominal wall, soft tissues of thigh, right scrotal sac.

A diagnosis of right emphysematous pyelonephritis with sepsis was made. He was started on intravenous antibiotics and re-initiated on haemodialysis. An urgent urology consult was sought, and he underwent an emergency right ureteric DJ stenting and percutaneous drainage of the perinephric/scrotal collection. He continued to make steady progress and his abdominal drains were removed on the eighth postoperative day. He received intravenous antibiotics for fourteen days. At no point of time during his hospital stay he required any antidiabetic medications for his blood glucose control. At discharge he was afebrile and hemodynamically stable. 3 months on follow up he is on continuous bladder drainage and thrice weekly maintenance haemodialysis through a left jugular permcath.

Discussion

Emphysematous pyelonephritis was first described in 1898 and since then it has been considered to be a rare clinical manifestation. However, with increasing incidence of diabetes mellitus this disease is being increasingly recognised in our clinical practice [4]. In a case series Fatima et al have shown that 20-30 % of Indian patients present with extensive gas formation (CT grade III/IV) and have sepsis and multiorgan dysfunction as initial clinical presentation [5]. Similar findings were also reported in another case series from North India [6]. All these patients (100%) had hyperglycemia. Hyperglycemia and infection with gas producing (mixed acid fermenting) bacteria are considered to be important elements in the development of emphysematous pyelonephritis [7]. Besides hyperglycemia, local tissue ischemia is an important pathophysiological factor which perpetuates the infection. Ureteral obstruction, which is the second most common predisposing factor, [8] can also cause local tissue ischemia which can further exacerbate tissue destruction. Obstruction related inadequate removal of gas from the affected renal parenchyma further aggravates the clinical presentation [9]. Besides ischemia, immune deficiency secondary to long standing chronic kidney disease, also plays a contributory role. We believe obstruction and long-standing kidney disease had an important synergistic role to play in our case who presented with extensive subcutaneous and scrotal emphysema. Not only early drainage of the perinephric collection [10,11], as is the standard of care, but also attention to the obstructed renal collecting system lead to a favourable outcome in our patient. A recent case series also highlighted the importance of upper tract obstruction as an important predisposing factor in the development of emphysematous pyelonephritis. In this report only one out of five (20%) had diabetes mellitus, whereas 60% (3/5) had upper tract obstruction [12]. Our case illustrates an important point of the synergistic role of various predisposing factors besides hyperglycemia which contributes to serious complications in a patient with emphysematous pyelonephritis. Attaining normoglycemia is an important goal of therapy, but early evaluation and treatment of an obstructed

urinary tract is also important.

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