

precipitating causes (most common being infections, especially pneumonia or urinary tract infection) for DKA during the management.<sup>[1]</sup>

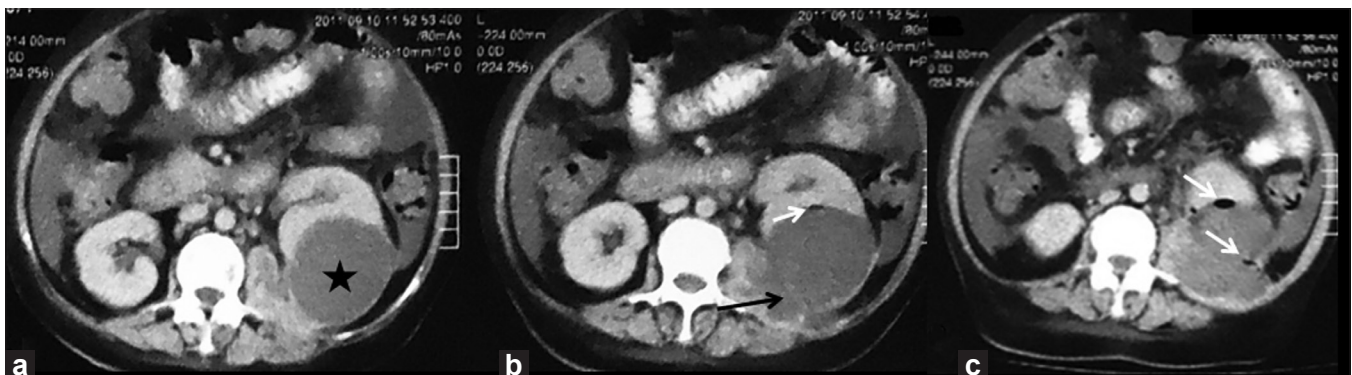
We report a 55-year-old female patient presenting with complaints of fever of 1 week duration. Fever was of high grade, intermittent, and was associated with chills and rigors. She was having breathlessness for 2 days before the presentation. Past history revealed that she was hypertensive and diabetic since 18 years; there were prior admissions with similar complaints, and she was diagnosed and treated for DKA.

On examination, she was conscious, oriented, pale, febrile, tachypneic, dehydrated, and was having bilateral pitting pedal edema. Vitals showed tachycardia and hypotension. Systemic examination revealed bilateral wheeze, basal crepitations, and tenderness over the left loin. Investigations showed reduced hemoglobin (8 g/dL) and elevated total count (TC; 19,600/mm<sup>3</sup>) with polymorph predominance (90%). She had high blood glucose and poor glycemic control in the past 6 months (HbA1c 9.0 gm %). Her renal function tests and liver function tests were normal. Urine analysis showed that urine was positive for ketone bodies and active deposits (18–20 pus cells per high-power field). Arterial blood gas analysis showed high anion gap metabolic acidosis with inadequate respiratory compensation. She was diagnosed with DKA and possible sepsis. Blood and urine cultures were drawn and patient was treated with empirical antibiotics. DKA was treated with intravenous (IV) infusion of human insulin, fluid resuscitation with IV normal saline, and potassium supplementation. Ultrasonogram abdomen and pelvis revealed fatty liver, mild splenomegaly and hyperechoic lesion in the lower pole of left kidney. Contrast-enhanced computed tomography (CECT) abdomen and pelvis revealed hypodense lesion in the lower pole of left kidney [star in Figure 1], with air pockets [white arrows, Figure 1] visible within the lesion

## Emphysematous pyelonephritis: Presenting as diabetic ketoacidosis

Sir,

Patients with diabetic ketoacidosis (DKA) usually have poor glycemic control for weeks to months before their presentation. It is necessary to rule out all the potential



**Figure 1:** Contrast-enhanced computed tomography (CECT) abdomen and pelvis revealed hypodense lesion in the lower pole of left kidney (star in a), with air pockets (white arrows in b and c) visible within the lesion and in the perinephric tissues. Lesion was seen extending beyond the Gerota's fascia (black arrow in b), with perinephric fat stranding

and in the perinephric tissues. Lesion was seen extending beyond the Gerota's fascia [black arrow, Figure 1], with perinephric fat stranding. Both blood culture and urine culture showed *Escherichia coli* growth [colony forming units (CFU)  $10^5$  in urine cultures]. She was finally diagnosed with sepsis, emphysematous pyelonephritis (EPN) Class 3B, and DKA. She was treated with percutaneous drainage of perinephric necrotic material under ultrasonogram guidance and with appropriate antibiotics, and glycemic control was achieved by IV infusions of human insulin. She made an uneventful recovery with the above management and was discharged with instructions to continue subcutaneous insulin injections for glycemic control.

EPN is a severe necrotizing infection of the renal parenchyma, with gas formation within the collecting system, renal parenchyma, and/or perirenal tissues, seen usually in diabetic patients.<sup>[2]</sup>

The first case of pneumaturia was reported in 1898; since then, approximately 200 cases have been reported. The commonly isolated organisms are *E. coli* (66%), *Klebsiella* (26%), *Proteus*, *Pseudomonas*, and *Streptococcus*; rarely, *Candida* and *clostridium* are also seen. Mixed organisms are seen in 10% of cases.

The infection has a fulminating course and can be fatal. The factors that predispose are uncontrolled diabetes, high levels of glycosylated hemoglobin, and impaired host immunity.<sup>[3]</sup> The mean age of presentation is 55 years, and it is six times more common in diabetics and females. Obstruction is the main cause of EPN in non-diabetics. Staging of renal parenchymal gas is made radiologically, and is useful for decision making and prognostication.<sup>[4]</sup>

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