A Case of Emphysematous Pyelonephritis

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Abstract
Emphysematous pyelonephritis is a rare but dangerous condition in patients with D.M. and urinary tract infection. We report a case of emphysematous pyelonephritis who presented to us with acute abdomen and sepsis. Her CT abdomen showed air in the collecting system of left kidney. She was managed with I. V. fluids, antibiotics, insulin, and percutaneous nephrostomy. But she died on the 3rd day of hospitalisation due to Multiorgan failure with sepsis.

Introduction
Emphysematous pyelonephritis (EPN) is a severe necrotising infection of the renal parenchyma and causes formation of gas within the collecting system of renal parenchyma and perinephric tissue. The first case of EPN was reported in 1898 by Kelly and Macmullem. Till date about 200 cases have been reported. We report a case of severe EPN in a diabetic patient presented with acute abdomen.

Case Report
Mrs G. 52 year old lady was admitted to the hospital with the history of severe abdominal pain, vomiting and fever since last 2 days. She was taking treatment from local doctor but without much effect. There was no melaena, loose motions, haematuria. She was a known diabetic since last 30 years and was on Insulin. She had also previous h/o stroke and fracture neck femur for which she was operated.

She was febrile, tachypnoeic, BP 90/60 mm.Hg, SPO2 was 80% with room air, tachycardia, pallor was present. There was no icterus, oedema feet was absent.

Examination of abdomen revealed tenderness in epigastrium and left flank region. There was no guarding or rigidity. Bowel sounds were sluggish.

Investigations
Her investigations were done which showed HB-10 gm%, TLC 16700/- DLC showed nutrophills 91%. Her blood sugar was 490 mg% platelet count – 28000/- per cmm. Blood urea was 131 mg, S creat 3.2 mg, Electrolytes, LFT, Ser. lipase were normal. Urine showed 100-120 P.C./ HPF. ECG. and 2 D-Echo were normal and X-ray chest showed bilateral bronchopneumonia. Her abdomen USG showed mildly enlarged left kidney with echoic shadow.

Her CT scan of abdomen was done and it revealed enlargement of the left kidney with multiple air pockets (Figure 1) in renal sinuses mostly in collecting system (Figure 2). No focal parenchymal lesion or calculas was noted. These findings were suggestive of EPN. Urine c/s showed e. coli growth.

She was immediately started on Insulin drip, IV. Antibiotics and oxygen. Since she was not able to maintain her SPO2, she was put on ventilatory support. Her percutaneous nephrostomy was done but she died on the 3rd day of hospitalisation due to sepsis and multiorgan failure.

Discussion
Emphysematous pyelonephritis is a severe necrotising infection of the renal...
parenchyma. It causes gas formation within the collecting system, renal parenchyma and perirenal tissues. EPN is common in diabetics and the clinical course of EPN is severe and life threatening.

It is commonly seen in patients with D.M., renal calculi can be other predisposing factor.

E. coli is common bacteria causing EPN. The other bacteria reported are klebsiella, protease, pseudomonas, streptococcus species. Mixed organism can also be found. Recently E. histolytica, aspergillus fumigatus have been reported to cause EPN.

The factors predisposing to EPN in Diabetes include uncontrolled DM, high levels of HbA1c, impaired host immune response.

In 1889 Muller first identified nitrogen, hydrogen and CO2 in a patient with EPN. Schainuck et al proposed that the fermentation products from necrotic tissue produced CO2. The major gas content found by investigators in EPN include nitrogen (60%) hydrogen (15%) CO2 (5%) and O2 (8%). Huang et al concluded that mixed acid fermentation is the mechanism of gas production based on presence of Hydrogen.

The condition is more common in females with uncontrolled D.M. The other rare causes are renal calculi, polycystic kidneys, CKD. Our patient was female patient with H/o D.M. since 30 yrs. She was on Insulin since last 10 years but her diabetes was uncontrolled, due to poor compliance.

The common clinical presentation are fever, flank pain, vomiting, dyspnoea, ARF, shock, sepsis and rarely crepitus over flank region.

**Classification**

EPN can be classified into 4 types.

Class 1 – Gas confined to collecting system.

Class 2 – Gas in renal parenchyma.

Class 3 A- Extension of gas to perinephric space.

Class 3 B – Gas in the pararenal space.

Patient should be aggressively managed with antibiotics, glucose control and percutaneous drainage. Once the patient is stabilised early nephrectomy is done.

Our patient was symptomatically treated for first 48 Hours. By the time she came to the hospital she had already developed severe sepsis with Multiorgan failure with compromised cardiorespiratory status. We managed her conservatively but could not save her. Patients with EPN may present with vague abdominal symptoms but deteriorate very fast, if not recognised early. Ureteric obstruction if present should be managed by percutaneous nephrostomy.

**Conclusion**

Acute renal infection with E. coli and Klebsiella in patients with D.M. or urinary tract obstruction are responsible for the development of EPN. The cornerstone of management is to recognise the condition at the earliest by CT study and treated with vigorous medical and surgical therapy other wise it can lead to catastrophic complication and death.

**References**

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