

EMPHYSEMATOUS PYELONEPHRITIS

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INTRODUCTION

Emphysematous pyelonephritis is a rare, life-threatening condition, which is commonly occurring in diabetic patients. It is a suppurative infection of renal parenchyma associated with gas production. The common presentations are fever (56%), vomiting (16%), abdominal pain (7%), shock (16%) and confusion (24%)¹. Other rare presentations are diabetic ketoacidosis, acute respiratory distress syndrome (ARDS), and disseminated intravascular coagulopathy (DIVC). We present a case of emphysematous pyelonephritis with above three rare presentations.

CASE REPORT

A 52-year-old Chinese woman with a ten years' history of diabetes mellitus on oral hypoglycemic agent was referred from a district hospital to us with urinary tract infection and severe sepsis. She was well until four days prior to admission when she started to have fever and right loin pain which were associated with dysuria and frequency. She was admitted to a district hospital where diagnosis of pyelonephritis was made and she was given intravenous antibiotic. Her loin pain and general condition worsen the next day and she was transferred to our hospital for further management. On arrival to our hospital, she was drowsy, tachypnoeic, hypotensive, and hypoxic. There was tenderness and a vague mass over the right lumbar region. Respiratory examination revealed bibasal crepitation. There were no meningeal signs or focal neurological deficit.

Investigations revealed haemoglobin of 8.7g/dL, total leucocyte count of $14.7 \times 10^3/\text{mL}$ with neutrophil predominant. Blood urea was 12.3 mmol/L and creatinine of 287 $\mu\text{mol/L}$. Potassium was 7 mmol/dL and liver function tests were suggestive of mild hepatitis. Urinalysis showed pus cells packed field and was positive for ketones. Coagulation profile suggestive of disseminated intravascular coagulopathy. Arterial blood gases showed pH of 7.161, PaCO_2 of 33.8 mmHg, PaO_2 of 42.9 mmHg, HCO_3 of 11.9 mmol/dL despite putting her on high flow mask of 15 l/min oxygen. She was ventilated and was started on intravenous imipenam. Abdominal X-ray done in the district hospital showed distorted outline of the right kidney with air in the perirenal region and intraparenchymal air (**Figure 1**) as well as dilated small bowel. No obvious calculus or retroperitoneal air were seen. These findings are consistent with emphysematous pyelonephritis and probable paralytic ileus due to peritonitis. Chest X-ray showed poor inspiratory film with non-specific widespread patchy opacities particularly at the perihilar region which could represent pulmonary oedema (**Figure 2**). Early respiratory distress syndrome was a possibility. Uncontrasted CT-scan of the abdomen confirmed the abdominal X-ray findings of emphysematous pyelonephritis (**Figure 3 and Figure 4**).

She was transfused with packed cells, fresh frozen plasma, and cryoprecipitate. Insulin infusion was started and resonium A was given 6 hourly. Inotropic agents were also used to bring up her blood pressure. She was monitored closely in the intensive care unit and urgent right nephrectomy was planned once the general condition improved. Unfortunately she passed away the next day. Blood culture grew *Klebsilla pneumoniae* sensitive to imipenam.

DISCUSSION

Acute pyelonephritis is common in diabetic patient but emphysematous pyelonephritis is rare. Both conditions can present with similar symptoms and signs as seen in our patient. Clinical suspicion of emphysematous pyelonephritis is important in view of its high mortality and surgical intervention may be required in this condition. Abdominal X-ray may show typical changes as seen in our patient, but only one-third of patients with emphysematous pyelonephritis have abnormal abdominal X-ray². Intravenous pyelography and ultrasound can be used and the sensitivities are 50% and 85% respectively¹. CT scan is the most sensitive (100%) investigation to confirm the diagnosis. It is also used to classify the severity of involvement³.