

Emphysematous pyelonephritis leading to end-stage renal failure

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A 63-year-old woman presented with a 2-day history of nausea, vomiting and abdominal pain. She deteriorated rapidly with the development of anuric acute kidney injury and respiratory failure, requiring admission to the intensive care unit for CVVH and ventilation. Her past medical history included type 2 diabetes mellitus, treated with insulin therapy and a previous right nephrectomy (12 years previously) for a renal cell carcinoma. Her pre-admission serum creatinine was 89 $\mu\text{mol/l}$, but previous HbA1c readings of 14.5% indicated suboptimal glycaemic control.

Initial investigations confirmed sepsis; *Escherichia coli* grown from blood cultures was treated with i.v. tazocin. An abdominal CT scan (Figures 1 and 2) demonstrated a dilated left kidney with air in the renal parenchyma, typical of emphysematous pyelonephritis, staged as Class 4 [4]. A plain AXR also demonstrated air within the left kidney (Figure 3). Treatment consisted of continuous i.v. antibiotics for 4 weeks and subsequently two percutaneous nephrostomies to facilitate drainage.

Urine output improved following treatment, but 3 months later the patient remains dialysis dependent and continues to suffer from urinary tract infections.

Emphysematous pyelonephritis is typically seen in female diabetic patients and *E. coli* is the commonest isolated organism [4]. Low oxygen tension within the kid-

ney enforces anaerobic metabolism in *E. coli*, which are facultative anaerobes [2]. Gas production is secondary to rapid tissue catabolism with fermentation of glucose to carbon dioxide, which is not effectively transported away and remains localized at the site of inflammation. Further ischaemia results in tissue necrosis and perpetuates an environment for gas formation. The resulting appearances on imaging are dramatic. Management should include fluid resuscitation, glycaemic control, antibiotics and drainage [3], but nephrectomy is sometimes necessary. Following recovery of the acute episode, function of the affected kidney, as in this case, is often very poor [1].

Conflict of interest statement. None declared.

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Fig. 1. Axial CT scan demonstrating dilatation and gas within the left kidney.

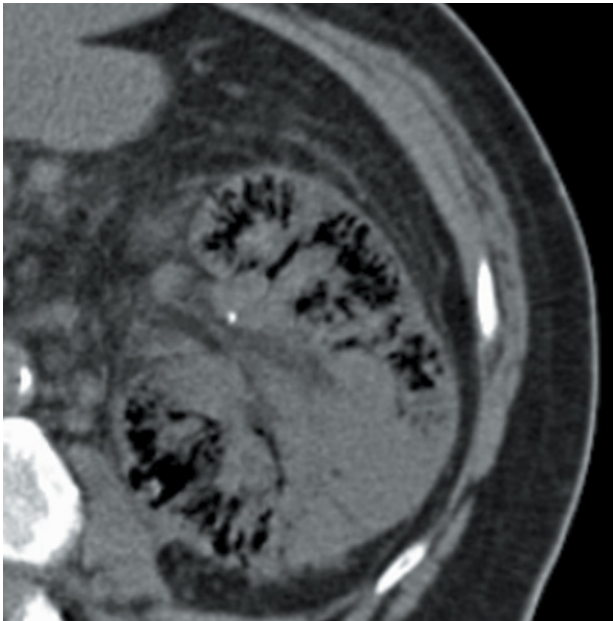


Fig. 2. Axial CT scan image of left kidney reveals emphysematous pyelonephritis.

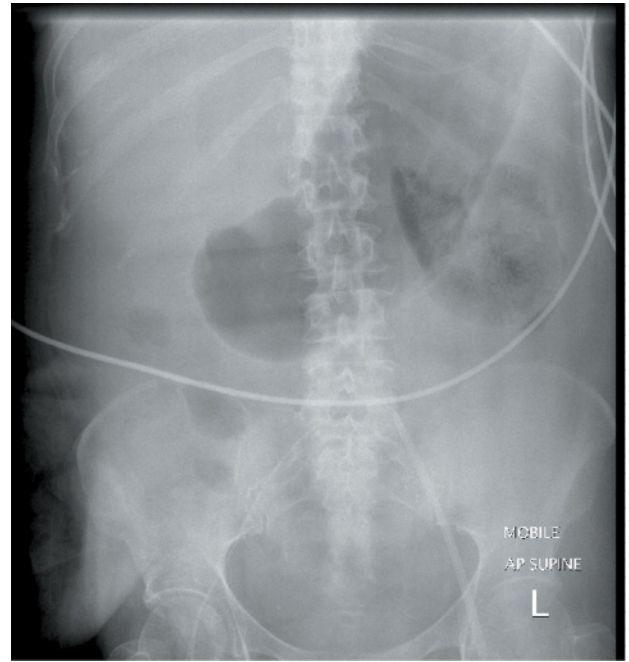


Fig. 3. Plain AXR demonstrating gas within the left kidney.