CT imaging is invaluable in diagnosing emphysematous pyelonephritis (EPN): a rare urological emergency

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DESCRIPTION

Emphysematous pyelonephritis (EPN) is an acute, fulminant and potentially fatal necrotising process with varying clinical presentations and a radiological classification. Most cases occur in diabetics with poor glycaemic control, while a minority are due to urinary tract obstruction. Early CT imaging is vital in diagnosing highly morbid EPN, with mortality rates of up to 69% described, and can necessitate nephrectomy.[1 2]

A 79-year-old woman, with non-insulin-dependent diabetes mellitus presented with confusion, fever, rigours and diffuse abdominal pain. Laboratory tests revealed a neutrophilia predominant leucocytosis, normal renal function and metabolic acidosis on arterial analysis. Prompt contrast-enhanced CT imaging clinched the diagnosis of left type I EPN, revealing an obstructing ureteric calculus and demonstrating air-fluid levels with an impressive volume of gas in the collecting system (figures 1 and 2). Vigorous resuscitation, inotropic support and the insertion of an ultrasound-guided nephrostomy with broad-spectrum antibiotics given initially formed the cornerstone of management. Urine and blood cultures returned positive for *Escherichia coli* and intravenous amikacin was administered for 10 days. She remained an inpatient for 4 weeks requiring a programme of supplementary nasogastric feeding and a structured rehabilitation programme of intensive physiotherapy. She gradually improved clinically and follow-up CT imaging displayed resolution of the gas and a decrease in the associated perinephric stranding and infection (figure 3).

Figure 1 Axial CT section showing gas within the collecting system of the left kidney and perinephric stranding.

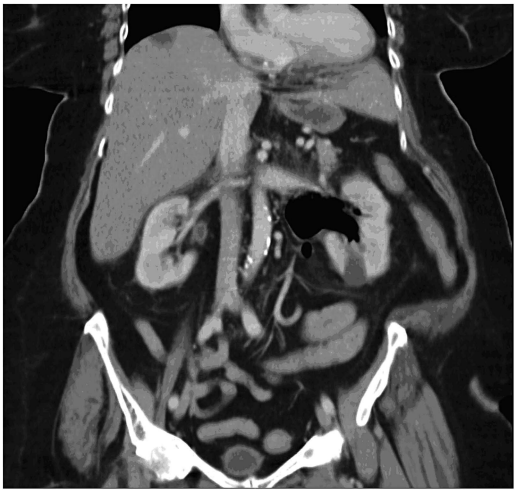

Figure 2 Sagittal CT section displaying an impressive volume of gas and resulting air-fluid level in the left kidney.

Figure 3 Sagittal CT section showing resolution of the gas within the renal collecting system and a decrease in inflammation. This corresponded to an improvement in the patient's clinical state.

Learning points

- Suspect emphysematous pyelonephritis (EPN) in unwell elderly patients with diabetes with a fever of unknown origin, or whose clinical presentation is suggestive of a urinary tract infection.
- Prompt CT imaging is vital in establishing a diagnosis of EPN and ruling out other causes for intra-abdominal sepsis.
- Early and aggressive resuscitation, empirical antimicrobial therapy and a drainage nephrostomy tube are imperative for a positive clinical outcome.

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Our case demonstrates the high index of clinical suspicion required to diagnose EPN and aggressive subsequent treatment strategies. We advocate a multidisciplinary approach with prompt CT imaging, which is instrumental in categorising the severity and type of EPN, thus guiding management.[3]

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