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.
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

Acknowledgements The authors would like to thank the medical records department.

Competing interests None.

Patient consent Obtained.

REFERENCES