

CLINICAL IMAGE

Emphysematous pyelonephritis

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Case Description

A 63-year-old man with a history of uncontrolled diabetes mellitus type 2 has presented with malaise, right flank pain, and nausea for 5 days. Laboratory findings were significant for severe thrombocytopenia with a platelet count of 30,000 per cubic mm, leukocytosis, acute kidney injury, and hypoalbuminemia. Computed tomography (CT) scan of the abdomen demonstrated marked enlargement of the right kidney with intraparenchymal, perinephric, and pararenal air, consistent with emphysematous pyelonephritis (Fig. 1). There was no drainable abscess or obstructive uropathy. Broad-spectrum intravenous antibiotic therapy was initiated, but his clinical status deteriorated over the next 2 days, requiring right nephrectomy. The patient subsequently improved. Histopathology of the nephrectomy specimen demonstrated florid acute inflammation and necrosis involving the renal parenchyma (Fig. 2).

In cases of emphysematous pyelonephritis, the presence of thrombocytopenia, acute renal impairment, hypoalbuminemia, and septic shock at presentation confers poor prognosis [1]. Based on CT scan findings, emphysematous pyelonephritis can be categorized into

Key Clinical Message

Emphysematous pyelonephritis is a gas-producing, necrotizing infection involving the renal parenchyma and surrounding tissue that is associated with high mortality and morbidity. Common causative organisms include *Escherichia coli* and *Klebsiella pneumoniae*. While most patients are being managed conservatively these days, nephrectomy may be needed in severe cases.

Keywords

CT scan, emphysematous pyelonephritis, nephrectomy

four prognostic classes: class 1: gas in the collecting system only; class 2: gas in the renal parenchyma without extension to extrarenal space; class 3A: extension of gas to perinephric space; class 3B: extension to pararenal space; and class 4: solitary kidney with this condition or bilateral involvement [2]. Milder cases (class 1 and 2) can be treated with percutaneous catheter drainage and antibiotic therapy, while severe cases may need nephrectomy as in ours (class 3B). Any urinary tract infection with systemic symptoms and/or above-mentioned laboratory abnormalities in a patient with diabetes should be evaluated further with a CT scan. Even small pockets of air anywhere in the urinary tract of these patients should prompt hospitalization and aggressive management [3].

Informed Consent

Informed consent has been obtained for the publication of this clinical image.

Conflict of Interest

None declared.

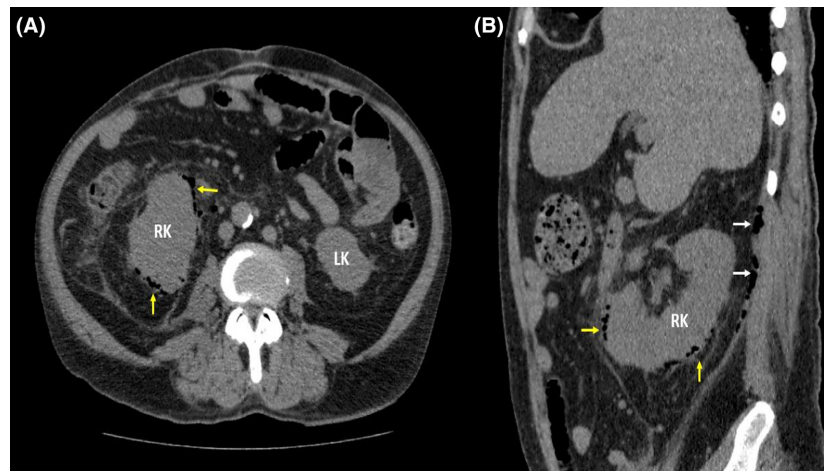


Figure 1. CT scan of the abdomen, transverse (A) and oblique (B) views demonstrating markedly enlarged right kidney with intraparenchymal, perinephric [yellow arrows], and pararenal air [white arrows] consistent with emphysematous pyelonephritis, grade 3B; RK, right kidney; LK, left kidney.

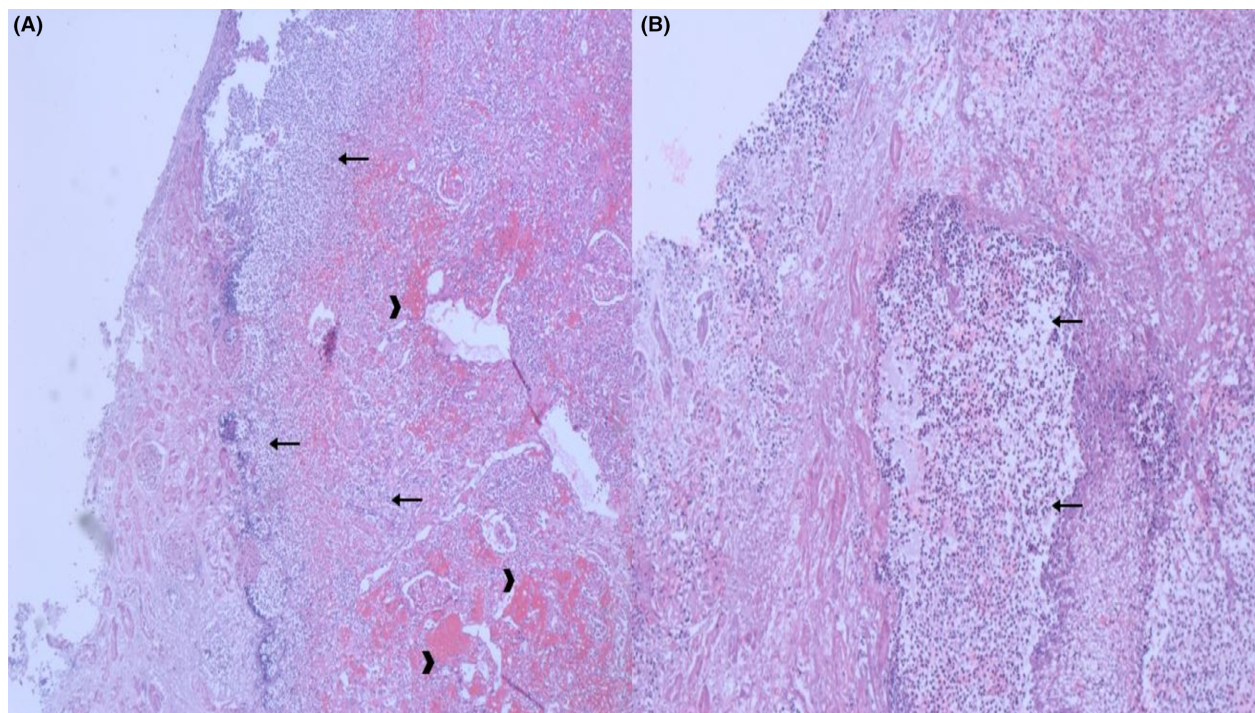


Figure 2. Histopathology of the nephrectomy specimen demonstrating (A) infiltration by the inflammatory cells [arrows] and hemorrhage in the renal medulla [chevrons]; (B) 20x magnification showing destruction of the renal architecture by acute inflammation and pus formation indicated by arrows [H&E, 20X].

Authorship

All the authors made substantial contribution to the preparation of this manuscript and approved the final

version for submission. AK: designed and drafted the manuscript. FRM: acquired the radiology images and performed literature search. XZ: Provided pathology images and pertinent input.

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