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CLINICAL IMAGE

Renal ultrasonography: a reliable diagnostic tool for pyonephrosis

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Key Clinical Message

Pyonephrosis is a rare purulent infection of the upper urinary tract, which can lead to rapid clinical deterioration. While contrast-enhanced CT scan is a sensitive test, point-of-care renal sonography can serve as a quick and valuable bedside tool for diagnosis, especially when iodinated contrast use is contraindicated.

Keywords

CT scan, pyonephrosis, ultrasonography.

Case

A 57-year-old woman presented with fever, abdominal pain, and nausea for 6 days. She was hypotensive at presentation, and laboratory data demonstrated leukocytosis, pyuria, acute kidney injury requiring renal replacement therapy (RRT), and lactic acidosis. Noncontrast CT scan of the abdomen revealed mild bilateral hydronephrosis with no perinephric stranding or fluid collection (Fig. 1). Vasopressors and broad-spectrum antibiotics were initiated. Exploratory laparotomy to identify a possible bowel source of sepsis was unremarkable. A renal ultrasound demonstrated moderate bilateral hydronephrosis with echogenic debris in right renal pelvis, suggestive of pyonephrosis (Fig. 2). She underwent emergent bilateral nephrostomy tube placement. Her blood and urine cultures were positive for *E. coli,* and antibiotics were adjusted accordingly. Follow-up ultrasound showed resolution of

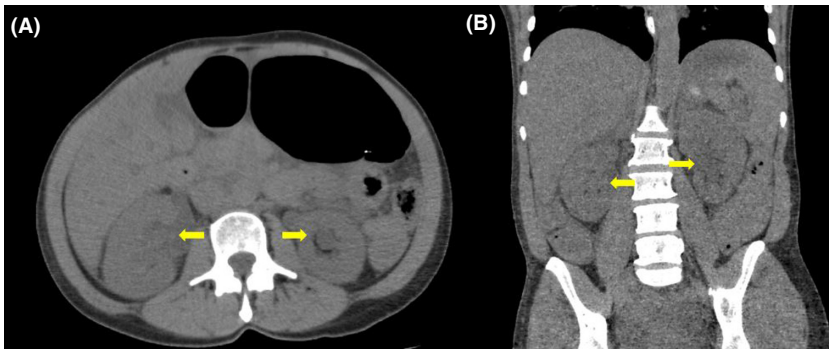

Figure 1. (A and B) Noncontrast computed tomography (CT) scan of the abdomen demonstrating bilateral mild hydronephrosis (arrows).

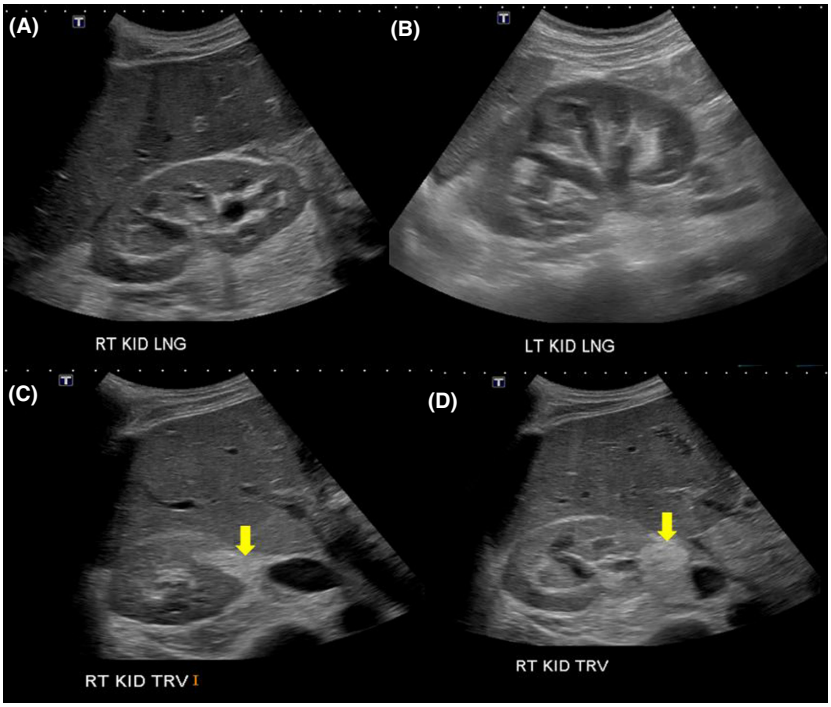

Figure 2. (A and B) Renal ultrasound demonstrating bilateral moderate hydronephrosis and hydroureter. (C and D) Transverse views of the right kidney showing echogenic debris (arrows) in the right collecting system in addition to fluid–fluid levels, suggestive of pyonephrosis.

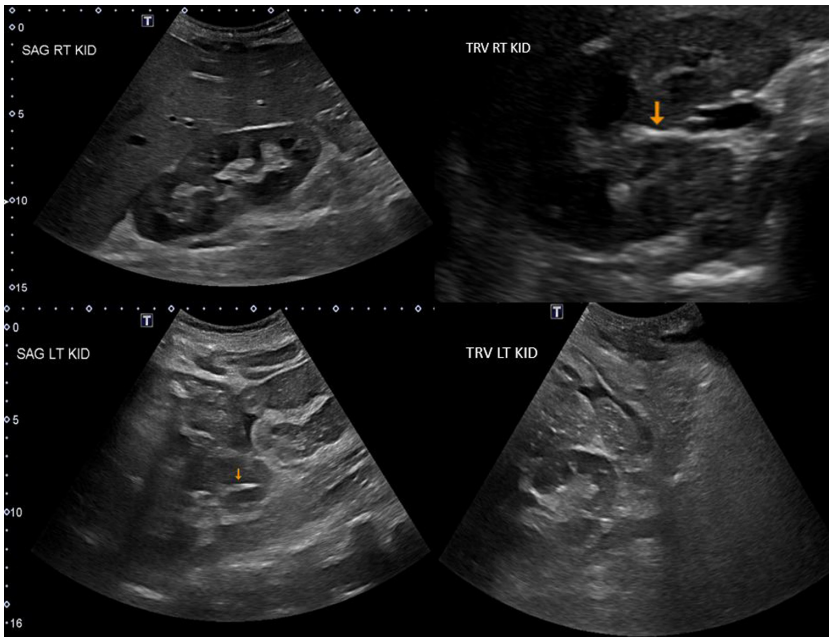

Figure 3. Follow-up renal ultrasound demonstrating resolution of hydronephrosis. Arrows indicate nephrostomy tubes.

hydronephrosis (Fig. 3). Patient subsequently showed rapid clinical improvement and RRT was discontinued.

Pyonephrosis is a rare purulent renal infection due to ureteric blockage, which can lead to septic shock and death [1]. Contrast-enhanced CT scan is commonly used for diagnosis, which may show findings of obstruction with renal pelvic wall thickening and layering of contrast material around the purulent fluid [1, 2]. However, the diagnosis can be missed

on unenhanced CT and ultrasonography is a valuable bedside tool for rapid diagnosis as in our case.

Conflict of Interest

The authors have declared that no conflict of interest exists.

Informed Consent

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

Authorship

All the authors have made substantial contribution to the preparation of this manuscript. MK: drafted the manuscript, performed literature search. JLL: participated in patient care and reviewed the manuscript. AK: reviewed and revised the manuscript critically for important intellectual content.

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