

Case	(469) Emphysematous pyelonephritis in a diabetic patient: an entity of maximum urgency
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CASE PRESENTATION

A 77-year-old woman who came to the emergency room with discomfort and fever of 40.1°C. Background is DM type II and she has a right hip prosthesis. Abdominal ultrasound is performed with suspicion of urosepsis.

DISCUSSION

Imaging findings: US: multiple hyperechoic foci without posterior shadow artifact in the intrarenal excretory system are visualized, interpreted as air bubbles (A).

In contrastenhanced CT, gas was visualized in the left renal pelvis, as well as, in a milder form, in the perirenal and anterior and posterior pararenal spaces; associated with gas there are inflammatory changes in the fat of the spaces described, all compatible with predominantly gas collections (B, C).

Four weeks after the antibiotic treatment, the episode has been resolved, with renal asymmetry (D). The findings correspond to emphysematous pyelonephritis class 3B of Huang and Tseng and emphysematous pyelonephritis type II of the Wan classification.

Emphysematous pyelonephritis (EP) is a necrotic infection characterized by the presence of gas in the renal parenchyma and/or the excretory system and the surrounding spaces. It affects diabetic patients in a characteristic but not exclusive way (may appear in patients with urinary tract obstruction), and the etiologic agent is usually *E. coli* (as in our case). Overall mortality 11-50%.

CT is the modality of choice for evaluating patients in which this entity is suspected¹. The main hypothesis for gas production is the intrarenal fermentation of glucose². Glycolysis via the Embden-meyerhof pathway generates pyruvate, and the intervention of enterobacteria involves the formation of formic acid, which is converted into CO₂ and H⁺ by bacteria in an acidic environment. Another mechanism (among others) would be the gas resulting from the necrotic tissue.

The classification of EP according to War is related to prognosis: A distinction is made between type I EP (parenchymal destruction without associated collections, worse prognosis) and type II EP (predominantly aerial renal or perirenal collections, better prognosis).

Another classification is that of Huang and Tseng, in which different classes of EP are distinguished:

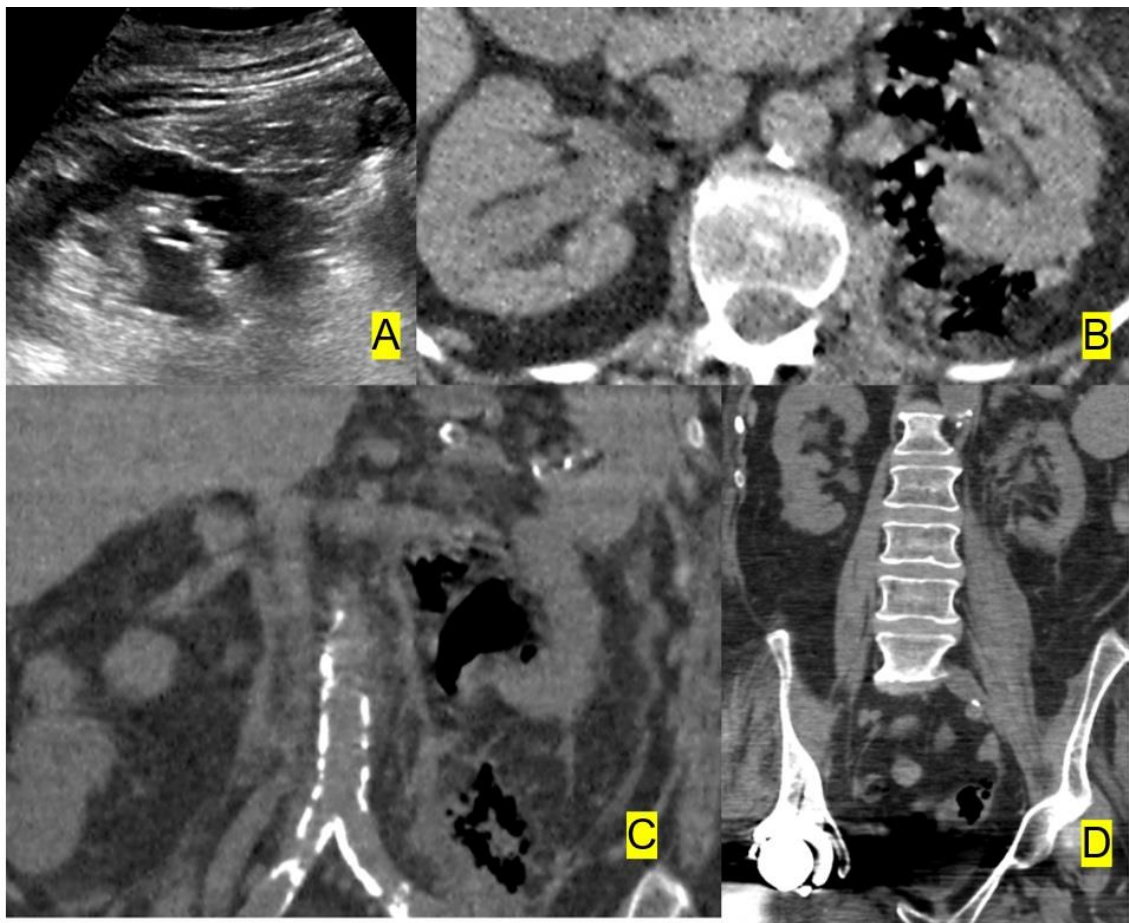
- Class 1: Gas only in the excretory system (equivalent to emphysematous pyelitis).
- Class 2: Gas limited to renal parenchyma.

- Class 3A: Gas/air collections in the perirenal space.
- Class 3B: Gas/air collections in the pararenal space.
- Class 4: Bilateral EP.

Treatment: medical treatment may be sufficient, although there is also the possibility of surgery/percutaneous drainage

CONCLUSION

EP is a serious disease that can be life-threatening, so that in a patient with suspected disease (especially if he has diabetes or other risk factors) the management and diagnosis with CT is considered appropriate for rapid diagnosis and treatment.



Ultrasound: multiple hyperechoic foci without posterior shadow artifact in the intrarenal excretory system are visualized, interpreted as air bubbles (A). In contrast-enhanced CT, gas was visualized in the left renal pelvis, as well as, in a milder form, in the perirenal and anterior and posterior pararenal spaces (B, C). Four weeks after the antibiotic treatment, the episode has been resolved, with the left kidney remaining smaller and with less enhance than the contralateral kidney (D).

BIBLIOGRAPHY

- Huang JJ, Tseng C. Emphysematous pyelonephritis. Clinoradiological classification, management, prognosis, and pathogenesis. Arch InternMed 2000;160:797-805.
- Craig WD et al: Pyelonephritis: radiologic-pathologic review. Radiographics. 28(1):255-77;quiz 327-8,2008.

