Emphysematous pyelitis

A 59-year-old woman with diabetes mellitus presented with shortness of breath, fatigue, muscle aches, and back and leg pain. A non-contrast abdominal CT scan reveals gas within the left urinary collecting system.

CLINICAL HISTORY

A 59-year-old woman with diabetes mellitus presented with shortness of breath, fatigue, muscle aches, and back and leg pain. No chills, fever, nausea, vomiting, or dysuria were present.

FINDINGS

A noncontrast CT scan of the abdomen shows gas within the left urinary collecting system. An irregularity of the L4 superior and inferior endplates was observed, along with gas within the L4 and L5 vertebral bodies, L3-4 and L4-5 disc spaces and spinal canal, and subtle paraspinal soft-tissue density at L4-5 (Figures 1 and 2). An MRI study confirmed the CT lumbar spine findings (Figure 3).

DIAGNOSIS

Emphysematous pyelitis complicated by emphysematous spondylodiscitis.
DIFFERENTIAL DIAGNOSIS

Gas appearance within the urinary system can be caused by the following:
• gas-producing bacteria, with Escherichia coli, Klebsiella pneumonia, and Aerobacter being the most common organisms;
• fistulas related to the gastrointestinal system; and/or
• gas reflux from the urinary bladder, either traumatic or iatrogenic.

DISCUSSION

Emphysematous infections in the abdomen and pelvis frequently progress rapidly to sepsis in the absence of any early therapeutic interventions. In this case, the patient was bacteremic, which led to emphysematous spondylodiscitis.

Emphysematous pyelonephritis and emphysematous pyelitis are two different entities whose management and prognosis are different. Emphysematous pyelonephritis is a severe gas-forming infection of the renal parenchyma or perirenal tissues with a substantial mortality rate. Emphysematous pyelitis is a term used to refer to gas present within the renal excretory system alone, without parenchymal involvement. It carries a mortality rate of up to 20%, which compares with 50% for emphysematous pyelonephritis. This condition is associated with diabetes and obstruction of the collecting system.

CT is the best imaging modality for depicting this disease process, as it is sensitive in localizing precisely air within the pelvicalyceal system rather than in the renal parenchyma and/or perinephric space.
Normally, the clinical management of emphysematous pyelitis and emphysematous pyelonephritis are different. Emphysematous pyelonephritis often has a fulminant course and can be life-threatening if left untreated. Thus, it is treated aggressively with percutaneous drainage and antibiotics and, possibly, nephrectomy. In the case of emphysematous pyelitis, if gas is localized to the collecting system and no obstruction is present, antibiotic therapy alone is sufficient. *Submitted by Dr. Trien Dang, Dr. Allen Cohen, and Dr. Christopher Wen, all from the University of California, Irvine Medical Center in Irvine.*

**BIBLIOGRAPHY**


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