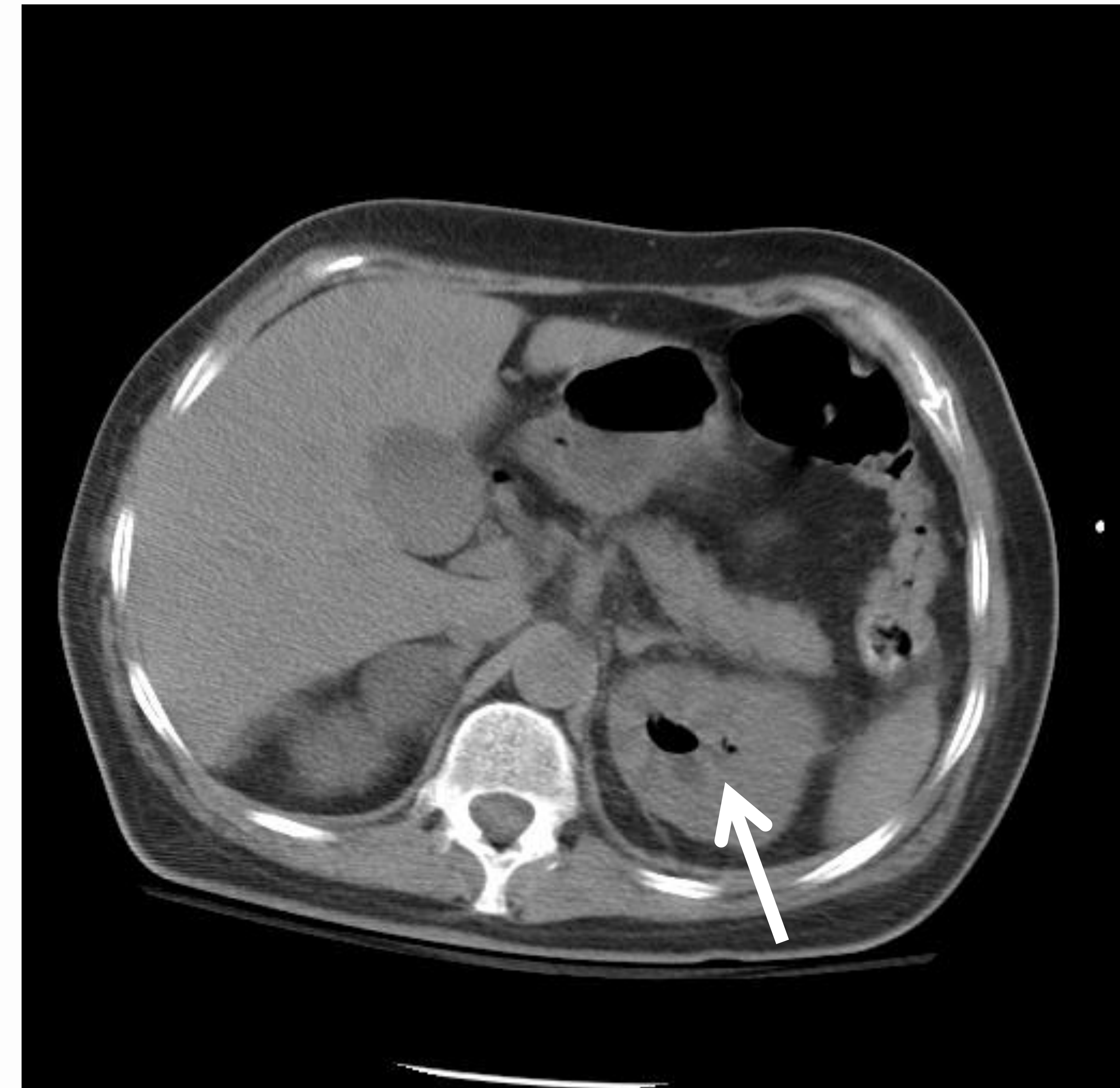


# Emphysematous Pyelitis

Peg Bicker MD, James H. Gilbaugh III MD, Nathan D. Tofteland MD

**Introduction:** Emphysematous urinary tract infections (UTI) may present with symptoms identical to pyelonephritis but have significantly worse outcomes including nephrectomy and death. These gas-producing infections cause rapidly-progressive necrosis of renal parenchyma and are associated with bacteremia and sepsis. Uncontrolled diabetes mellitus is the major risk factor for this complicated UTI.

**Case Description:** A 50-year-old Hispanic female with uncontrolled diabetes (*Hgb A1c 12.1%*), presented to the emergency department with flank pain, fever, and nausea for the previous two days. She was septic with leukocytosis, bacteremia, hypotension and tachycardia. Blood cultures were positive for *Escherichia coli*. CT of the abdomen and pelvis demonstrated gas within the left ureter and renal collecting system consistent with Stage 1 emphysematous pyelitis. She rapidly improved with IV antibiotics.



**Discussion:** Emphysematous pyelitis (gas in the renal collecting system) and emphysematous pyelonephritis (gas in the renal parenchyma) are rapidly-progressive, potentially fatal infections. They are most commonly seen in females with uncontrolled diabetes. Mean age at diagnosis is 60 years. Flank and abdominal pain are common presenting symptoms. Dysuria is present in only ½ of cases. Diagnosis may be made by x-ray or CT, though CT is more sensitive. Treatment choice depends on the degree of extension of gas and infection into the kidney tissue, renal capsule or beyond. Given the high prevalence of diabetes mellitus, the clinician must maintain an element of suspicion for this potentially deadly complication in an at-risk patient presenting with complicated UTI.

Stage	Characteristics on CT	Treatment Recommendation
Stage 1	Gas in collecting system	Parenteral antibiotics
Stage 2	Gas in renal parenchyma	Antibiotics plus percutaneous catheter drainage (PCD)
Stage 3A	Gas or abscess to perinephric space	Antibiotics plus PCD, possible nephrectomy
Stage 3B	Gas or abscess extending to tissue beyond kidney	Antibiotics plus PCD, possible nephrectomy
Stage 4	Bilateral involvement or involvement of a solitary kidney	Antibiotics plus PCD, nephrectomy is a last option

Indications for immediate nephrectomy include failure of PCD, or two or more of the following: thrombocytopenia, shock, acute renal failure or altered mental status

## References

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