

CLINICAL VIGNETTE

Acute Bilateral Pyelonephritis

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Introduction

Pyelonephritis is an infection of the kidney resulting from a pathogen that ascends from the bladder. Typical symptoms include dysuria, urinary urgency and frequency associated with fever, flank pain, nausea or vomiting. The incidence of acute pyelonephritis is highest among woman aged 15-35 years. Annual rates of outpatient and inpatient pyelonephritis in the female population were 12-13 cases per 10,000 population and 3-4 cases per 10,000 population, respectively.¹ *Escherichia coli* is the causative organism in approximately 80% of cases in women.² Imaging is not required to make the diagnosis, but when obtained it generally shows unilateral kidney involvement. Here we describe the case of a young woman who developed acute bilateral pyelonephritis.

Case Report

A 19-year-old female presented to the emergency department with abdominal and back pain for four days. She reported progressive right lower quadrant pain as well as bilateral lower back pain. The pain was severe, throbbing and worse after eating. Review of systems was notable for nausea, subjective fevers and chills. She initially attributed her symptoms to constipation, so she took mineral oil, magnesium and an over-the-counter colon cleanser. She had a bowel movement on the morning of presentation. She reported being sexually active with one male partner and had an intrauterine device in place. The patient had no significant past medical or surgical history and did not use any chronic medications or supplements. She reported having a remote urinary tract infection but had no prior similar symptoms.

Vital signs on presentation included temperature 99 °F, blood pressure 140/97, pulse 96, respiratory rate 16 and oxygen saturation 99% on room air. Her physical exam was remarkable for right lower quadrant tenderness to palpation with no costovertebral angle tenderness. Laboratory data showed a white blood cell count of $11.31 \times 10^3/\mu\text{L}$. Hemoglobin, platelets, electrolytes and creatinine were within normal limits. Urine pregnancy test was negative. Urinalysis was positive with 86 white blood cells/high power field, 113 squamous epithelial cells/uL, 3+ leukocyte esterase and negative nitrite.

An ultrasound of the appendix was concerning for acute appendicitis, with notable findings including luminal dilation with associated wall thickening, hyperemia and a small amount of periappendiceal fluid. The patient was given intravenous

fluids and 2 grams of cefoxitin due to the concern for appendicitis. She required multiple doses of intravenous morphine for pain control. Surgery was consulted, and CT abdomen and pelvis with intravenous contrast revealed a normal appendix. However, there was evidence of bilateral ureteritis and bilateral pyelonephritis (Figure 1).

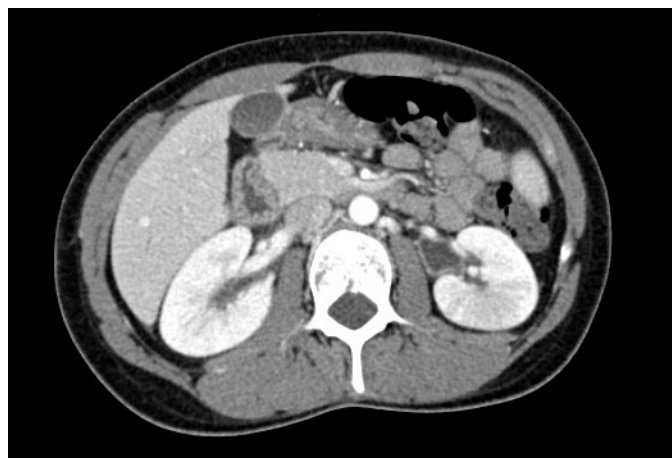


Figure 1. CT scan of the abdomen and pelvis with contrast demonstrated areas of hypoattenuation of the kidneys, greater on the left side. Subsequent images showed bilateral ureteritis extending to the level of the bladder.

The patient was admitted to the medicine service for management of bilateral pyelonephritis. Further tests obtained included urine and blood cultures as well as urine tests for chlamydia and gonorrhea. She was started on intravenous ceftriaxone. Intravenous vancomycin was added once initial urine culture results showed growth of a staphylococcus organism. She developed red man syndrome after receiving the majority of the vancomycin infusion. Symptoms resolved after stopping the infusion and administering diphenhydramine. Urine culture ultimately grew 100,000 colony-forming units/mL of *Staphylococcus saprophyticus*. Sensitivities were not sent as the organism is typically pan-sensitive. The patient was discharged home on the day after admission with a plan to complete a ten-day course of sulfamethoxazole/trimethoprim. Blood cultures and urine tests for chlamydia and gonorrhea resulted after discharge and were negative.

Discussion

The majority of cases of acute pyelonephritis occur in otherwise healthy women. Factors associated with pyelonephritis in this patient population include sexual intercourse, spermicide exposure, personal or family histories of urinary tract infections, diabetes and incontinence.³ While most cases can be managed in the outpatient setting, the presentation can vary, including life-threatening illness in severe cases. Increased morbidity and mortality, including bacteremia, acute kidney injury and shock, are associated with bilateral acute pyelonephritis.⁴ Bilateral kidney involvement is significantly less common although it is difficult to estimate prevalence as imaging is not routinely obtained in the outpatient setting.

A literature review of the relatively few documented case reports of bilateral pyelonephritis demonstrates a main focus on emphysematous pyelonephritis. This is a rare, life-threatening infection that more commonly occurs in those with poorly controlled diabetes mellitus.⁵ Our case demonstrates an uncommon presentation of a common diagnosis. The patient had no lower urinary tract symptoms, and her only risk factors were recent sexual intercourse with use of an intrauterine device for contraception. Imaging was initially suggestive of an alternate diagnosis. This highlights the importance of a thorough evaluation for each patient to avoid misdiagnosis due to an atypical presentation.

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