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**Title:** UTI With a New Renal Mass: Chicken or the Egg? **Introduction:** Here we present a case of a woman who presented with signs, symptoms, and a workup concerning for acute pyelonephritis. The case was complicated by bedside ultrasound and CT imaging revealing an enlarged left kidney with grossly distorted architecture which could be mistaken for malignancy by the clinician unfamiliar with this specific, rare pathology. **Case Description:** A 58-year-old female presented to the ED with lower abdominal pain for one month. Two days prior to presentation she developed left flank discomfort, fevers, and chills. Physical examination was notable for T 101.3F, HR 118, RR 27, lower abdomen and left flank tenderness. The patient's urine was turbid with large leukocyte esterase, large blood, elevated WBC, and many bacteria. CBC revealed WBC 18.2 and platelets 582. BMP showed normal appearing renal function. Ultrasonography of the left kidney showed a "bear paw" sign, and CT showed perinephric inflammation, a diffusely enlarged upper pole with multiple fluid locules and a large stone in the infundibulum. An astute radiology read reported the findings could be consistent with xanthogranulomatous pyelonephritis. The patient was admitted and treated with IV ceftriaxone for acute sepsis. Urine cultures grew *Proteus mirabilis*. She was discharged on oral cefpodoxime and underwent a left total nephrectomy 6 weeks later with a surgical pathology report confirming the diagnosis. **Discussion:** Xanthogranulomatous pyelonephritis (XGP) is a rare and aggressive variant of chronic pyelonephritis, most commonly due to chronic nephrolithiasis and infection. Characteristic ultrasound findings include an enlarged kidney with grossly distorted architecture including dilated and multiloculated calyces indicating pyelitis, staghorn calculi seen as large amorphous echogenicities with posterior acoustic shadowing, and a "bear paw" sign similar to the CT finding created by multiple adjacent anechoic/hypoechoic masses which are xanthomatous conglomerates. Imaging characteristics can mimic malignancy creating a diagnostic dilemma. Urinary cytology and presence of staghorn calculi with perirenal inflammatory changes help differentiate from urothelial cell carcinoma. Diffusion weighted imaging can help differentiate from renal cell carcinoma (RCC) showing marked restricted diffusion in the cystic infiltrate of XGP compared to RCC. Acute infections are treated with antibiotics, however definitive management is nephrectomy.

**Keywords:** "xanthogranulomatous pyelonephritis"; "chronic pyelonephritis"; "pyelonephritis"; "renal mass"; "renal imaging"



*Figure 1: Coronal CT of the abdomen and pelvis displaying a left kidney (white arrows) with multiple fluid filled locules and thick septations with a stone seen in the infundibulum.*