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Answer: Bear Paw sign of Xanthogranulomatous Pyelonephritis

The contrast enhanced (portal venous phase) CT of the abdomen showed a global enlargement of the right kidney. There are multiple low attenuation areas in the renal parenchyma, in a 'hydronephrotic type manner', but with no true hydronephrosis. This is due to a renal calculus lying in a contracted pelvis with dilated calyces that contain inflammatory debris. A rim of normal renal tissue enhances peripherally. The appearances are those of diffuse xanthogranulomatous pyelonephritis (XPN), in a 'bear paw' pattern (**Panel**).¹

XPN is a well recognised, but uncommon, chronic inflammatory disorder of the kidney, in which the renal parenchyma is destroyed and replaced with lipid laden macrophages. These 'foamy' lipid laden macrophages (xanthoma cells) are accompanied by granulomatous tissue resulting in a reduced or non-functioning kidney. It may be diffuse or focal in nature. The diffuse form is the most common, representing 90% of cases.² It is most often unilateral. It is induced by recurrent bacterial infection, most commonly *Proteus mirabilis* and *Escherichia coli*.³

XPN is largely a disease of adults, with a strong female preponderance; although it can occur in childhood. Ten percent of patients have diabetes mellitus.



Axial computed tomography showing the 'Bear paw' sign. Arrow indicate the enhancing rim of normal renal tissue.

XPN is usually associated with nephrolithiasis. In 75% of cases there is a centrally obstructing calculus, often a 'staghorn' calculus. Dilated debris filled calyces give rise to the description of a 'bear paw' appearance. The rim of the kidney exhibits contrast enhancement, and there is often limited excretion into the renal collecting system due to a poor functioning kidney. This is usually accompanied by perinephric inflammatory change or a perinephric collection (**Arrow, Panel**). Although ultrasound is typically performed in the diagnostic process and may be suggestive of XPN, CT is the definitive form of assessment and also allows accurate assessment of any extra-renal extent.⁴

After initial antibiotic therapy, the definitive treatment is usually with a nephrectomy.

REFERENCES

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