



Focal Acute Pyelonephritis in Two Months Pregnant Woman: A Case Report

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Abstract

Acute pyelonephritis is a bacterial infection of the renal pelvis and parenchyma, most commonly seen in young women. Complicated and uncomplicated pyelonephritis, xanthogranulomatous pyelonephritis, and tuberculosis are all urinary tract infections for which imaging evaluation adds diagnostic information important for patient care. The incidence of focal acute pyelonephritis parallels that of lower urinary tract infection, approximately five times more common in female with a sharp increase following puberty. Diagnosis is typically based on characteristic clinical feature and abnormal laboratory values. Imaging aids further assessment. Here we present a case of young pregnant women who reported with severe right loin pain and burning micturition for an emergency ultrasound. Ultrasound showed features of acute pyelonephritis. Routine urine examination showed plenty of pus cells and absence of RBC. Considering risk: benefit ratio, the clinician performed CT scan which confirms the diagnosis.

Introduction

Acute pyelonephritis is a bacterial infection of the renal pelvis and parenchyma, most commonly seen in young women. It continues to have significant morbidity in certain group of patients. Urinary tract infection typically originates in the urinary bladder; when it migrates to the kidney or is seeded there hematogenously, a tubulointerstitial inflammatory reaction ensues, involving the renal pelvis and parenchyma. The condition is characterized as pyelonephritis. Generally, they involve women between eighteen and forty years old. Women are mainly predisposed to bacterial colonization of urethra and urinary bladder for anatomical reasons. Moreover, the sexual intercourse increases the risk of infections due to the trauma on the urethral meatus and probably

also to changes in the vaginal bacterial flora. Diagnosis of acute pyelonephritis is mostly clinical. Typical pyelonephritis symptoms include fever with chills, flank pain, nausea and vomit, dolorability in costo-vertebral angle, associated or no to symptoms suggestive of cystitis. Imaging is not routinely indicated in urinary tract infections, however with severe symptoms, high-risk immunocompromised state, diabetic patients and antibiotic non-responders, it become necessary.

Case Report

A 26 years old pregnant woman of about 2 months gestation came with severe right loin pain and burning micturition for an emergency ultrasound. Ultrasound showed a hyper echogenic area at mid parenchyma of right kidney extending up to the cortex.

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Fig.-1: *Ultrasound of Right Kidney. Color Doppler was done for further evaluation which showed displacement of adjacent vasculature by the lesion and no internal blood flow with peripheral rim like vascularity.*

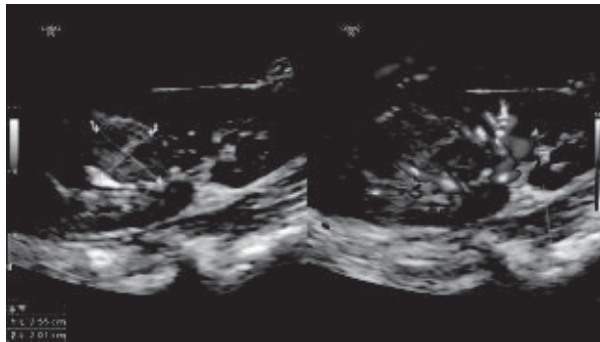


Fig.-2: *Color Doppler Findings.*

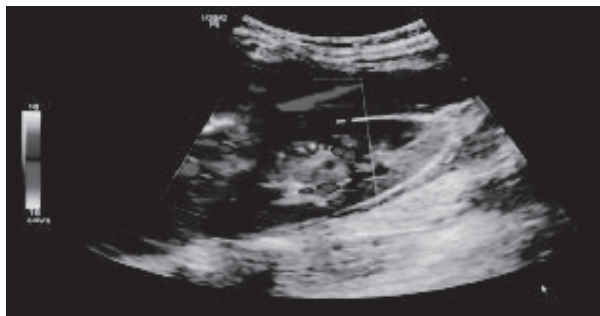


Fig.-3: *Color Doppler Findings*

Routine urine examination showed plenty of pus cells and absence of RBC. Patient was given antibiotic therapy for management and advised to perform MRI of KUB and follow up for further evaluation. The patient refused to continue pregnancy. So, the clinician decided to perform CT scan of KUB considering risk: benefit ratio. After 1 week, the patient came in the department of Radiology & Imaging of SSMCH for CT scan. On CT, showed a wedge shaped non enhancing hypo density at the right renal interpolar cortical region without any hydro nephrosis.

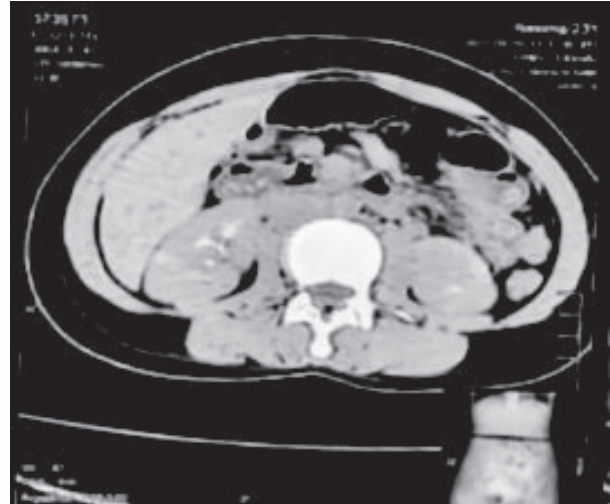


Fig.-4: *CT scan of KUB*

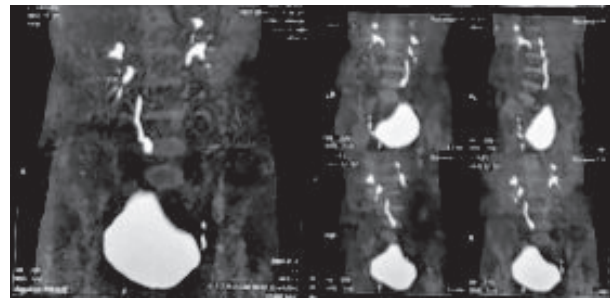


Fig.-5: *CT Urography*

Discussion

Infections of the upper urinary tract can be distinguished in simple and complicated: the first ones occur in an anatomically and functionally normal urogenital system, in absence of previous surgical interventions on the urinary tract, in immunocompetent patients. Generally, they involve women between eighteen and forty years old. Women are mainly predisposed to bacterial colonization of urethra and urinary bladder for anatomical reasons. Moreover, the sexual intercourse increases the risk of infections due to the trauma on the urethral meatus and probably also to changes in the vaginal bacterial flora. Non-complicated infections can occur in older women as well, probably due to decreasing of circulating estrogens with consequent atrophy of vaginal mucosa, reduction of the vaginal physiological bacterial flora, difficulties in bladder emptying or low intimate hygiene in elderly patients. Complicated infections occur in a structurally or functionally anomalous genito-urinary system, or in presence at least of one local or systemic factor

that can reduce the efficacy of antimicrobial therapy, with possible persistent pathology or distant recurrences.

Diagnosis of acute pyelonephritis is mostly clinical. Typical pyelonephritis symptoms include fever with chills, flank pain, nausea and vomit, dolorability in costo-vertebral angle, associated or no to symptoms suggestive of cystitis. Imaging is not routinely indicated in urinary tract infections, however with severe symptoms, high-risk immunocompromised state, diabetic patients and antibiotic non-responders, it become necessary.

Plain radiography has a limited role, especially if patients are likely to go on to CT. Abdominal radiographs may demonstrate obstructing urinary tract calculi and occasionally may demonstrate gas within the collecting system (emphysematous pyelonephritis).

Ultrasound is insensitive to the changes of acute pyelonephritis, with most patients having normal scans. Possible features include particulate matter/debris in the collecting system, reduced areas of cortical vascularity by using power Doppler, gas bubbles (emphysematous pyelonephritis), abnormal echogenicity of the renal parenchyma, focal/segmental hypoechoic regions (in edema) or hyperechoic regions (in hemorrhage), mass-like change. Ultrasound is however, useful in assessing for local complications such as hydronephrosis, renal abscess formation, renal infarction, perinephric collections, and thus may guide management.

CT is a sensitive modality for evaluation of the renal tract which shows affected parts of the kidney edematous, swollen and of lower attenuation. Renal calculi or gas within the collecting system and perinephric stranding may be evident on non-contrast scan. Post contrast scan shows one or more focal wedge-like regions with swollen and reduced enhancement compared with the normal portions of the kidney. The periphery of the cortex is also affected, helpful in distinguishing acute pyelonephritis from a renal infarct (which tends to spare the periphery; the so-called 'rim sign'). Striated nephrogram may also be visible.

MRI is usually reserved for patients who are pregnant, and findings mirror those seen on CT. The kidney demonstrates wedge-shaped regions of altered signal which is hypo intense compared with the normal kidney parenchyma on T1W, hyper intense compared to normal kidney parenchyma on T2W and reduced enhancement following contrast.

Most patients respond rapidly to appropriate antibiotic therapy and imaging is required only in patients with severe symptoms, high-risk immunocompromised state, diabetic patients and antibiotic non-responders and for follow up.

Conclusion

Urinary tract bacterial infections are common urologic disease in women. Moreover, they tend to recur throughout life and in the same relatively small group of women. In most cases, bladder and renal infections are asymptomatic and manifest by demonstrating coincidental bacteriuria. In some instances, however, especially with frequent sexual activity, pregnancy, stone disease, or diabetes, symptomatic cystitis, pyelonephritis develops and antimicrobial therapy is indicated. Pregnancy is a common cause of obstructive uropathy and severe renal infections are relatively common. Because they usually arise from preexisting covert bacteriuria, experts recommend screening and eradication of these silent infections as a routine prenatal practice.

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