

Kidney infection:

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Acute pyelonephritis:

Example:

30 years women present with rt. flank pain associated with high temp. (39.c) with frequency dysuria urgency O/E rt. renal angle tenderness , GUE show pyuria ?

Inflammation of kidney parenchyma and renal pelvis the diagnosis usually clinically.

Presentation and finding:

chills ,fever

lower urinary tract symptoms(dysuria frequency urgency)

loin pain (cost vertebral angle tenderness).

dx.:

GUE: wbc ,RBC.

Leukocytosis ,increase ESR,

C-reactive protein elevation

Urine C/S:E. Coli ,klebsiella, proteus, enterobacter, pseudomonas.....

Or gram positive :: streptococcus fecalis Staph. aureus

Increase risk in reproductive women , sexually active , D.M, urinary incontinence.

Radiological DX.:

Contrast enhanced computed tomography(CT) scan is the best for diagnosis, it is not always indicated unless the diagnosis unclear or the patient not responding to therapy.

Radionuclide study sensitive

U/S is important to rule out concurrent urinary tract obstruction but not reliable for diagnosis of infection.

MANAGEMENT:

Depend on the severity:

In patients who have toxicity because of associated septicemia (which is the most important serious complication): hospitalization is indicated with empiric therapy is indicated with parenteral (ampicillin and aminoglycoside is effective(other alternative : amoxicillin with clavulanic acid or third generation cephalosporin can be used).

Fever may persist for several days despite antibiotic. So a parenteral therapy should be maintained until the patient defervesces.. parenteral treatment may for 7-10 days . then change for oral treatment for 10-14 days.

In not severely ill: outpatient treatment with oral anti biotic is appropriate(flouroquinolons or TMP-SMX) therapy should continue for 10-14 day.

Emphysematous pyelonephritis:

Example :

Diabetic female with lt. side loin pain ,high temp.(39.5) with chills . history of renal colic on the same side 2 weeks ago .with or without lower urinary tract symptom. O/E: tender kidney?

Is a necrotizing infection characterized by the presence of gas within the renal parenchyma or perinephric tissue. Associated with DM or urinary tract obstruction.

Presentation:

Fever flank pain vomiting , pneumturia

Cause: E.coli, klebsiella pneumonia and enterobacter cloacae.

Dx:

Radiologic examination (gas overlying the affected kidney
CT more sensitive.

Management:

Control of blood sugar

Relief urinary obstruction

Fluid resuscitation

Parenteral antibiotics

Drainage by PCN,or JJ stenting

Nephrectomy

Chronic pyelonephritis:

Ex. :

Young male discovered accidentally by routine U/S that one of his kidneys is smaller than normal with scarring, and his family gave a history of recurrent lower urinary tract infection in early childhood.

Result from repeated renal infection which leads to scarring, atrophy and subsequent renal insufficiency. So it is radiological entity rather than clinical entity.

Presentation:

Asymptomatic, but history of frequent UTI, (in children there is a strong relation between renal scarring and recurrent UTI.

Scarring rarely seen in adult kidney unless associated with obstruction

Complication due to renal insufficiency as hypertension, head aches, visual disturbance, fatigue, polyuria.

Other patient may present with acute infection of the kidney on chronic pyelonephritis, may mimic acute pyelonephritis, or with less severity, mild symptoms of dull aching, fever, with lower urinary tract symptoms: dysuria, frequency, nocturia, urgency. With or without obstruction by stone or others.

Dx:

Radiological investigation (U/S, EU....).

GUE: protein, urea, leukocytes.

Serum level of creatinine may reflect the severity of renal impairment

CT scan, radioisotope scan study.

Management:

it is limited because renal damage caused by chronic pyelonephritis is not reversible.

Eliminating the UTI

Identifying and correcting underlying anatomic or functional problem (obstruction).

Long term prophylactic antibiotics .sometime Nephrectomy may indicated.

Renal abscesses:

Sever infection that lead to liquefaction of renal tissue forming an abscess.

Perinephric abscesses:

when renal abscess rupture to perinephric space.

Paranephric abscesses:

when extend beyond Gerota's fascia.

Result from hematogenous spread.

Staphylococcus, E.coli, proteus.

Presentation:

Fever , flank or abdominal pain, chill , dysuria may takes 2 week to diagnose.

May flank mass.

GUE: WBC.

Urine C/S : positive ,mostly gram negative bacilli, or gram positive mostly staph .

Blood C/S.

Dx :U/S, CT scan,

Excretory urography is less sensitive.

TREATMENT:

Antibiotics empiric therapy (ampicillin or vancomycin in combination with aminoglycoside or third generation cephalosporin.

PCN(percutaneous nephrostomy) or insertion of JJ stent

Open drainage or nephrectomy.

Pyonephrosis:

it is bacterial infection of hydronephrotic, obstructed kidney(septic dilatation of the renal pelvis) which lead to suppurative destruction of the renal parenchyma and potential loss of renal function.,

Presentation :

Fever , chills,

Flank pain

Lower tract symptom may not present.

Bacteruria or pyuria may not present when there is complete obstruction of the affected kidney.

Dx:

U/S is sensitive also to see if there is a stone.

Ct scan.

Management :

Immediate institution of antibiotics therapy and drainage of infected collecting system.

Usually use broad spectrum antibiotics,

Drainage : by using Dobell J stent (JJ STENT) if the patient not toxic.

If the patient is tired : PCN or open nephrostomy

Other Additional evaluation is needed to evaluate if any cause for urinary obstruction to be treated accordingly.

Genitourinary tract tuberculosis:

Renal tuberculosis:

T.B bacilli may invade one or all organs of genitourinary tract and cause chronic granulomatous infection that give the same character as tuberculosis of other organ.

The infecting organism is *Mycobacterium tuberculosis* , through hematogenous route from the lungs.

The kidney and the prostate is the primary site of TB in the GUT .

Pathogenesis:

If enough bacteria of sufficient virulence become lodged in the kidney and are not overcome, a clinical infection is established.

TB of the kidney is slow progress it may take 15-20 years to damage a kidney in a patient with good resistance, so may no symptoms', of urinary system pain or any clinical disturbance, apart from symptoms of the

primary site of TB ,which usually pulmonary till the lesion invade the calyces or the pelvis the pus and the organisms discharge to urine so symptoms of cystitis.

Then may reach the pelvic mucosa and ureter where causing hydronephrosis.

Then a caseous breakdown of tissue until the entire kidney replace by cheesy material.

Calcium may laid down.

Because ureteral fibrosis may complete that may lead to autonephrectomy(fibrosed and non functioning kidney).

Tubercles may undergo a central degeneration and caseate, creating a tuberculous abscess cavity that can reach the collecting system and break through. So paranchymal damage. And depending on the patient resistance healing by fibrosis occur.

Symptoms and signs :

TB of GUT should be considered in the presence of the following:

1. chronic cystitis not responding to treatment.
2. sterile pyuria(negative urine culture with pyuria).
- 3.hematuria.
- 4.non tender enlarge epididymis with beaded or thickened vas.
- 5.chronic draining scrotal sinus.
6. induration or nodulation of prostate or seminal vesicle.

History of TB elsewhere in the body, mostly pulmonary bring suspicion

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Symptoms:

Most symptom of the disease even in advanced stage are vesical in origin(cystitis).

Generalize fatigability, low grade fever but persistent with night sweats.

Some time Asymptomatic.

Dull aching pain.

Passage of blood clot secondary calculi or a mass of debris may cause renal or ureteral colic.

Or painless mass in the abdomen.

Signs:

There may be evidence of extra genital TB , may found in(lungs ,bone, lymph nodes tonsils, intestines)

There is usually enlargement or tenderness of involved kidney.

Diagnosis:

1. persistent pyuria without organisms on culture means tuberculosis until proven otherwise.
24 urine for AFB (acid fast bacilli).
2. 3-5 first morning voided specimens, for culture for TB. bacilli is highly positive.
3. X-ray: enlargement of the kidney, obliteration of psoas shadow. Punctate calcification, renal stones calcification of the ureter. Excretory urogram (EU) can be diagnostic: absence of the function of the kidney (in addition to moth-eaten appearance of involved ulcerated calyces, obliteration or dilatation of calyces, abscess cavity ureteral stricture).
4. U/S
5. CT scan with contrast is highly sensitive for calcification and characteristic anatomic changes.
5. cystoscopy is indicated to see the extent of the disease in the bladder.

Complication:

Perinephric abscess, renal stones, uremia if both kidneys involved.

Treatment:

A strict medical regimen should be instituted. The following drug in combination: isoniazide (INH), rifampin (RMP), ethambutol (EMB). Streptomycin, pyrazinamide, usually intensive course for 2-3 months (by using INH, RMP, EMB), followed by 3 months of treatment with INH and RMP two or three times per a week according to European association of urology. If resistance to any drug we can replace by other listed drugs.

Surgical treatment :

Is indicated when there is perinephric abscess, should be drained and nephrectomy should be done either then or later to prevent development of chronic draining sinus

Note : surgical intervention should be preceded by 3 weeks course of anti TB drugs. To prevent complication.

