Kidney Infection

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Etiology & Route of Infection

it arises in the following ways:

- **§** Ascending infection: it is the commonest route of infection especially during vesicoureteric reflux.E. coil is the commonest microorganism, other gram negative organisms, streptococci & staphylococci.
- **§** Haematogenous infection: staphylococcal infection from primary in the tonsil, skin, teeth, also in renal tuberculosis, & candida.
- **§** Infection via lymphatics: is seen rarely in inflammatory bowel disease and retroperitoneal abscess.

Classification

- **q** Acute Pyelonephritis
- **q** Chronic Pyelonephritis
- **q** Pyonephrosis
- **q** Perinephric Abcess
- **q** Renal Tuberculosis
- **q** Xanthogranulomatous Pyelonephritis
- **q** Emphysematous Pyelonephritis

Acute pyelonephritis

It is more common in females (especially during childhood, puberty, marriage, pregnancy).

Clinical features:

- **ü** Headache, lassitude.
- **ü** Acute pain in the flank and hypochondrium.
- **ü** Fever, up to 38.8 or 39.5
- **ü** Symptoms of cystitis (urgency, frequency, dysuria)
- **ü** O/E tenderness in the hypochondrium and the loin.

Differential diagnosis:

pneumonia, appendicitis, cholecystitis.

Investigation:

- Midstream urine examination (bacteria, pus cells)
- Urine culture and sensitivity.
- KUB x-ray & Ultrasound of abdomen and pelvis

Treatment:

- while waiting for the C/S. broad spectrum antibiotic is start.
- analgesic
- good hydration
- then change the antibiotic according to the sensitivity result

Chronic pyelonephritis

- Usually associated with vesicoureteric reflux.
- Pathologically, there is interstitial inflammation and scarring of the renal parenchyma.
- The females are 3 times more common affected than males, usually under the age of 40 years.

Clinical features:

- Lumber pain: dull in nature.
- Increased urinary frequency and dysuria.
- Hypertension (40%).
- Headache, anorexia, malaise.
- Pyrexia: attacks of low grade fever.
- Anemia: due to renal impairment
- Uremia.

Investigations:

- Midstream urine examination (bacteria, pus cells).
- Urine culture and sensitivity.
- KUB x-ray & Ultrasound of abdomen and pelvis.
- Voiding Cystourethrography, Excretory Urography, Renal Isotope Scan.

Treatment:

1- Prevention of predisposing factors like acute infection, obstruction or stones.

2 - Surgical treatment with nephrectomy indicated in end stage disease with infection, hypertension.

Pyonephrosis

the kidney is converted into multilocular sac containing pus or purulent fluid

- Pyonephrosis can result from:
  - infection of a hydronephrotic kidney
  - Following acute pyelonephritis
  - most commonly arise as a complication of renal calculus disease.
- usually unilateral

Clinical features:

- The classical traid of symptoms is anemia, fever and loin swelling.

- **v** when the condition arises as an infected hydronephrosis, the swelling may be very large and the pyrexia very high and associated with rigors.

Investigations:

- **ü** GUE
- **ü** Plain X-ray → may show a calculas
- **ü** U/S → will demonstrate dilatation of the renal pelvis and calyces.
- **ü** I. V. U. → will show poor function and features of hydronephrosis on the affected side.

Treatment:

- It is a surgical emergency (lethal septicemia),
- Paranteral antibiotics should be given immediately and the kidney drained by percutanous nephrostomy or open nephrostomy (if the pus is too thick to be aspirated).
- If there is a stone → should be removed
- Nephrectomy → if the kidney function is fully damaged and the other kidney function is good

Perinephric abscess

The causes include:

1) Extension from a cortical abscess.
2) Haematogenous spread of distant infection.
3) Extension of appedicular abscess.
4) Via periureteral lymphatics.

Clinical features:

- **ü** high swinging pyrexia
- **ü** Abdominal tenderness & fullness in the loin.
- **ü** Always there is high leukocytosis but there are no pus cells or microorganisms in urine.

Investigation:

- **Ø** G.U.E.
- **Ø** Plain abdominal X-ray → will show obscured psoas shadow, reactionary scoliosis (with the concavity towards the abscess,), elevation and immobility of the diaphragm on the affected side.
- **Ø** U/S and C T scan are diagnostic.

Treatment:

By either percutaneous or open lumber incision drainage under antibiotics control

Renal Tuberculosis

- Ø It arises from a haematogenous infection from a distant focus
- Ø Usually unilateral
- Ø Mycobacteria and pus cells are discharged into the urine
- Ø there will be tuberculous abscess, pyonephrosis, perinephric abscess, and the kidney is progressively replaced by caseous material which may calcified (cement kidney).
- Ø Renal tuberculosis may be associated with tuberculosis of the bladder, epididymis.

Clinical features:

- Usually occur between 20 to 40 years of age, men are more affected than females.
- Frequency: day & night time frequency.
- Sterile pyuria.
- Painful micturation: suprapubic pain with dysuria.
- Renal pain: dull ache in the loin.
- Haematuria 5%
- Constitutional symptoms: Evening pyrexia, weight loss.
- O/E prostate, seminal vesicle, vas and scrotum are nodular & thick

Investigations:

- ü bacteriological examination of at least 3 early morning urine samples, stained with Ziehl - Nielsen stain to show the presence of acid fast bacilli
- ü Plain abdomen X-ray: may show calcified lesion of the kidney
- ü I.V.U.: hydrocalyces & hydronephrosis due to fibrosis of the renal pelvis or the ureter, tuberculosis abscess may show as space-occupying lesion, shrunken bladder.
- ü Cystoscopy: the bladder is studded with granulomas near the ureteric orifice it may coalesce to produce tuberculous ulcer.
- ü chest X-ray: to exclude an active lung lesion.

Treatment:

- ü Antituberculous combination chemotherapy.
- ü Pyeloplasty in case of strictured renal pelvis.
- ü Boari flap in case of ureteric stenosis.
- ü Nephroureterectomy in case of non- functioning kidney.
- ü illiocystoplasty in case of small contracted bladder