Acute infections of the upper urinary tract

Acute pyelonephritis:
- usually bacterial (ascending)
- usually there is predisposing factor: stone; duplex systems + reflux or obst.; obstructive lesions; DM
  - In Adults only selected patients need imaging
  - If associated with pain and not response to simple measures ..........imaging
  - US and Plain film ” stone, obstruction, abscess formation)

US feature of acute infection:
- Normal
- Diffuse or focal swelling of the kidney + decrease echogenisity.
- If pain sever, IVU or CT KUB .... Stone

Following resolution of acute episode, imaging is done in:
- Women with recurrent UTI.
- Men: after single confirmed UTI.

US of kidneys ... Stone, obstruction
  - UB ... full bladder for stone or mass
  - Post voiding ... residual urine

Children Investigation of the renal tract is indicated in all children with a confirmed UTI.
  - US: size, stone, scarring, hydronephrosis and hyroureter; Bladder for residual urine
  - Micturating cystography: usually in male... reflux, urethral valve

Renal and Perinephric abscess
Usually by US or CT
- Intrarenal abscesses;
  - Thick wall, both cystic and solid component
  - But may look like a simple cyst
  - Enhancement of the wall in CT
- Simple cyst may become infected ... thicker wall with layered debris.
- Perinephric abscess:
  - take the shape of the kidney
  - contains solid and cystic parts with debris
  - Usually origins from the kidney, so look for renal abnormalities.

Pyonephrosis
- Occur only in obstructed systems.
- Usually Dx by US : demonstrated obstructed system containing echogenic debris
**Tuberculosis**

✓ Blood borne of Mycobacterium tuberculosis, usually from a focus of infection from the lung
✓ Usually starts from cortex, then tubules and to other portions of UT.
✓ Early U/S and IVU may be normal
✓ Later stages best seen on IVU:
  - Earliest change is irregularity of calyx then become a cavity.
  - Calcification are common (irregular. may involve all the kidney “autonephrectomy”).
  - Stricture at any part with dilatation, usually multiple
  - Irregular, thick wall, small volume Bladder.
  - Multiple urethral strictures.

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**Chronic pyelonephritis (reflux nephropathy)**

- Is late appearance of focal or diffuse scarring of the kidney from reflux of infected urine.
- Most damage occurs in the 1st years of life.
- Severity of reflux diminishes with age.
- Usually bilateral and asymmetrical.

**Image finding in reflux:**

✓ Scar formation (local reduction in renal parenchymal width) usually in upper and lower poles.
✓ Dilatation of calices in the scarred areas.
✓ Overall reduction in renal size: loss and no growth of the parenchyma.
✓ Dilatation of the affected collecting system.
✓ Best confirmation is by voiding cystography.

**Papillary Necrosis**

✓ Part or all of the renal papilla sloughs and may fall into the PCS.
✓ May cause obstruction or appear as filling defect.
✓ Associated condition: high anelgesic intake, DM, Sickle cell disease, infection (sever, with obstruction).

**Imaging findings**

- Usually by IVU, although CT urography may demonstrate it
- Usually patchy in distribution and severity
- Contrast seen around or into the papilla
- If papilla sloughed, calyx appear spherical
- May be seen as filling defect or causing obstruction.
- It may calcify.

“**If you are not willing to learn, No one can help you;**

*If you are determined to learn, no one can stop you*** Dr. Nasr

“Look at the PowerPoint file, for images and illustrations couldn’t be printed”