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Radiology

Renal System

Renal Block

Editing File

color index:
Black: Main text
Pink: Girls slides
Blue: Boys slides
Red: important
Gray: Notes & explanation

Radiology MED438

Objectives

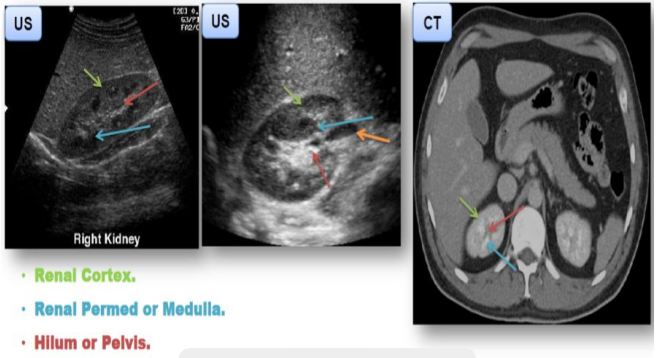
- Modality used for assessment of the urinary system
  - X-ray
  - us
  - Ct
  - MRI
  - Nuclear

- Normal anatomy

- Common pathologies
  - Kidney
  - Ureter
  - Bladder
  - Urethra

Renal Radiology

Kidney



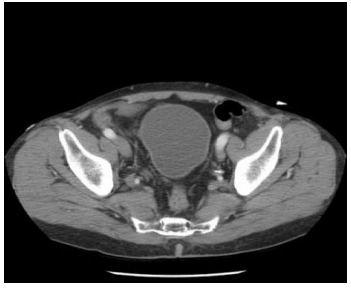
- Renal Cortex.
- Renal Permed or Medulla.
- Hilum or Pelvis.
- Ureter

Ureter

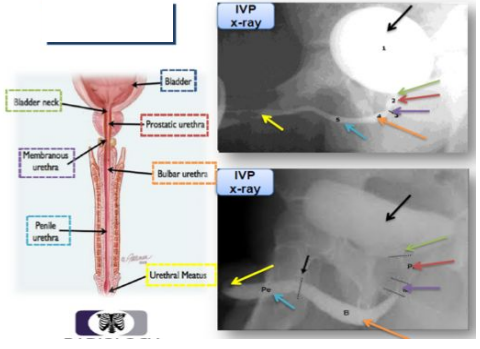
Urethra

X-ray (IVP) used for patient has urethral injury
Showing a Cut off in the urethra

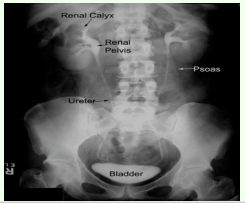
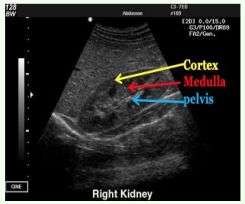
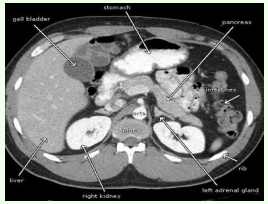
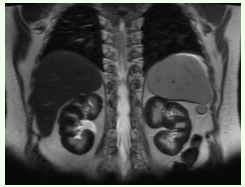
Bladder



- Bladder.
- Bladder neck.
- Prostatic urethra.
- Membranous urethra.
- Bulbar urethra.
- Penile urethra.
- Urethral meatus.



Modalities used

Modalities	X-Ray	IVP	US	CT	MRI	Nuclear
Images						
Image Key	**White =** bone and calcification. **Grey =** soft tissue. **Black =** air.	An intravenous pyelogram is an x-ray **examination** of the kidneys, ureters and urinary bladder that uses iodinated contrast material injected into veins.	**White=** stones and calcification. **Grey =** soft tissue. **Black =** fluid. Note: Renal fat is hyperechoic on US.	**White=** bones and calcification. **Grey=** soft tissue. **Black=** air.	**White=** high intensity.(Fluid) **Grey to black =** low intensity.	Dark gray to black is the nuclear fluid flow pathway
Pros	inexpensive , quick		no ionizing radiation , inexpensive , portable	quick , a lot of information	no ionizing radiation , a lot of information	**assess the function**
Cons	ionizing radiation , not definitive		operator dependent, time consuming	ionizing radiation , expensive	expensive , time consuming, **better for soft tissue**	time consuming , radioactive materials

Common kidney pathologies

1) Cysts (benign , common , bosniak classification)

Ultrasound

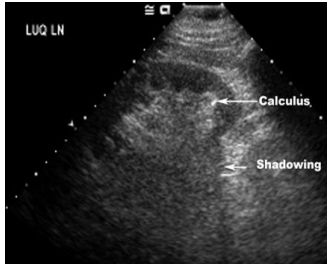
2) Stones

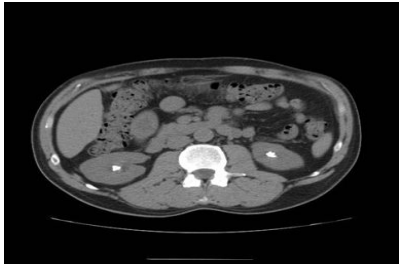
2.1-Radio-opaque (calcium , struvite)

2.2-Radio-lucent (uric acid , cysteine)

A patient has hematuria, flank pain, **without fever** and stones what is the best imaging technique for diagnosis?

CT without contrast



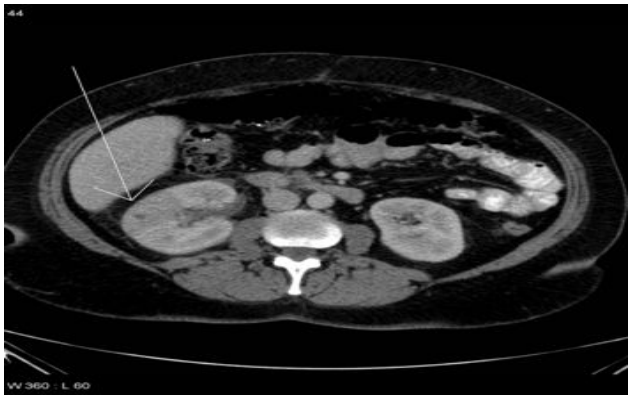


3) Hydronephrosis

Common kidney pathologies

4) Pyelonephritis:

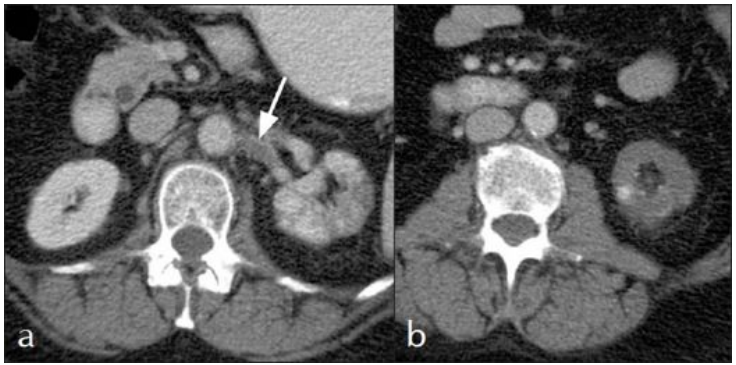
A. is the infection of the kidney. (Fever & Flank Pain)
B. Acute pyelonephritis results from bacterial invasion of the renal parenchyma. Bacteria usually reach the kidney by ascending from the lower urinary tract.
C. CT scan for a patient with pyelonephritis, **we do it only if the patient doesn't respond to the treatment or he had a recurrent pyelonephritis** & cystitis.



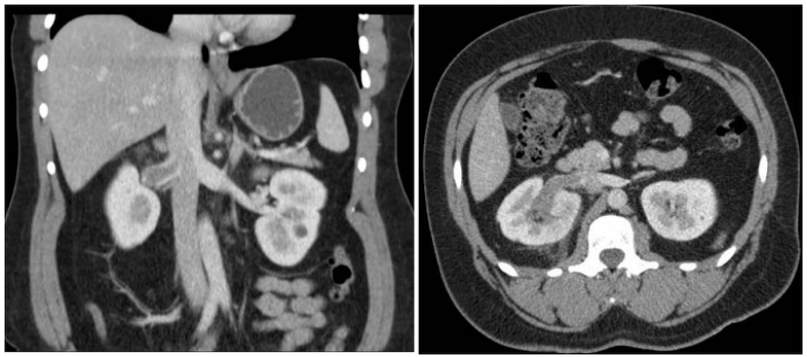
CT With contrast

5) Renal thrombosis

5.1) Artery

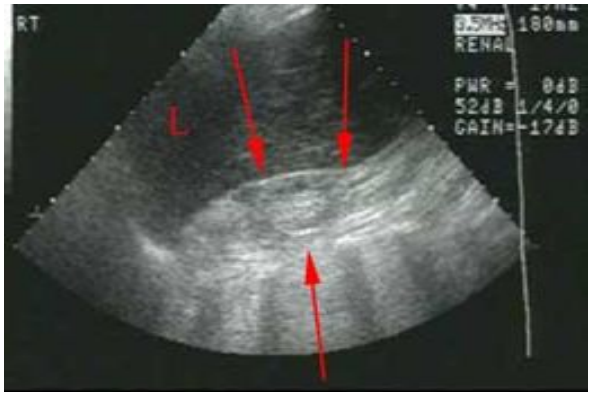


5.2) Vein



Common kidney pathologies

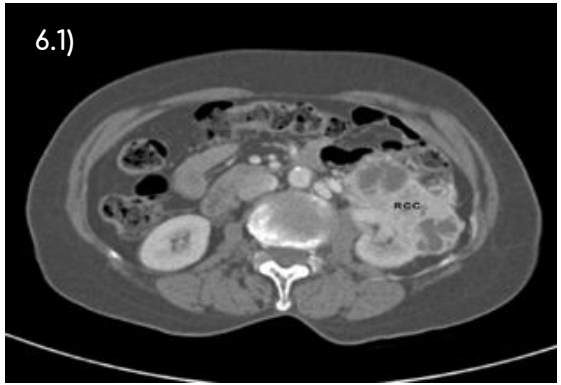
6) End-stage renal disease (ESRD): is the last stage of chronic kidney disease. (Atrophy)



7) Tumors,

7.1)Benign, most common benign is angiomyolipoma

7.2)Malignant, most common type is renal cell carcinoma



Common kidney pathologies

8) congenital

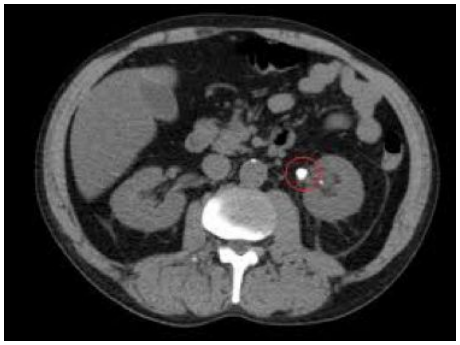
8.1) Horseshoe kidney

8.2) Ectopic Kidney

8.3) Polycystic Kidney

Common Ureter pathologies

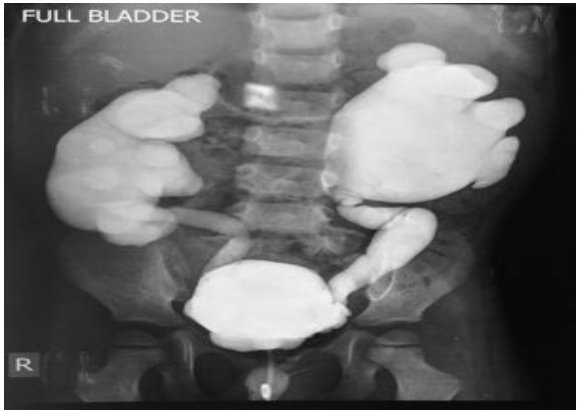
1) Ureteric Stone: (Flank pain) stones in the ureter will make a obstruction and block the urines way to the bladder, which may cause Hydronephrosis & hydroureter.

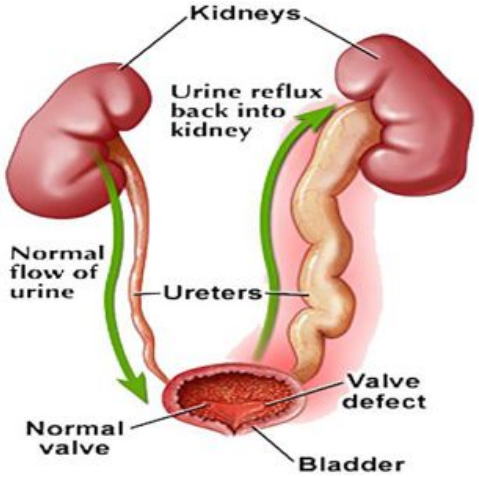


Common Ureter pathologies

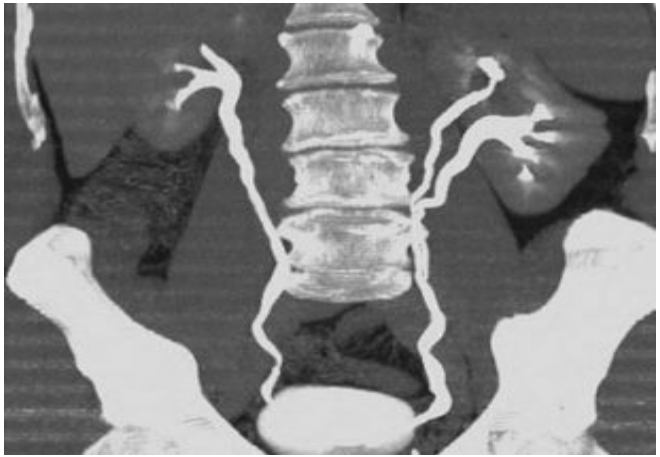
2) vesicoureteral reflux disease :
a condition in which urine flows retrograde, or backward, from the bladder into the ureters/kidneys

Diagnosed by IVP.





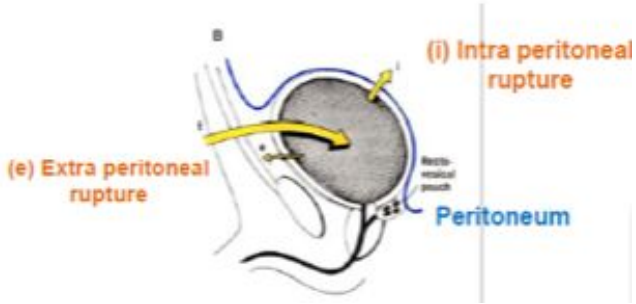
3) Duplicating Collecting System:
common congenital renal tract abnormalities, characterized by an incomplete fusion of upper and lower pole moieties resulting in a variety of complete or incomplete duplications of the collecting system.



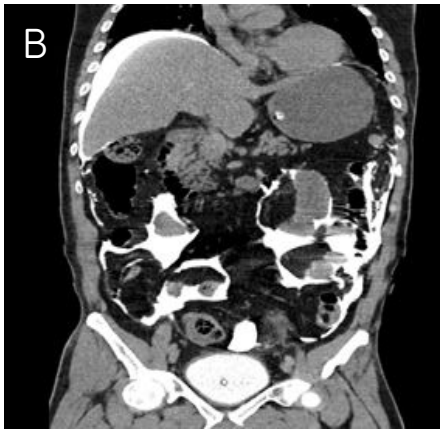
Common Urinary bladder pathologies

1) Bladder rupture:

- The abdomen is lined with the peritoneum from inside.
- The bladder is located below the membrane of the peritoneum.



A) Extra peritoneum: any rupture or leakage to the content of the bladder does not enter the peritoneum. Patient does not need surgery.

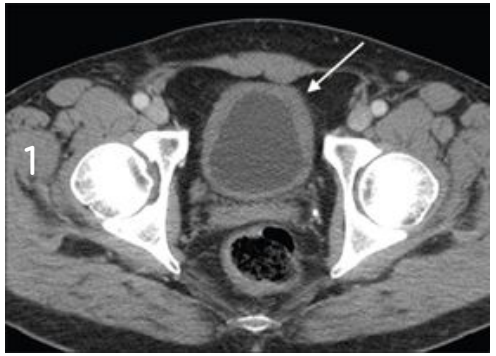


B) Intra peritoneum: there is a rupture in both bladder and peritoneum. In this case, patient will need surgery.

CT with contrast to differentiate between extra or intra

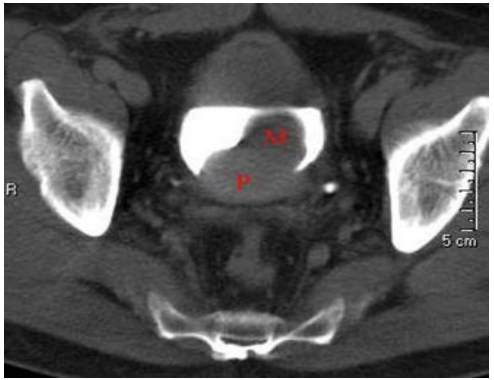
Common Urinary bladder pathologies

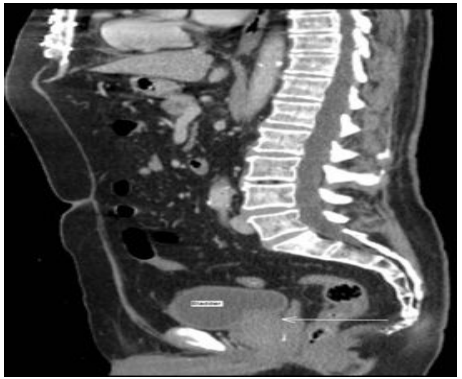
2) Cystitis: (Suprapubic pain) (Fever or without)
-Image 1: an inflamed urinary bladder (thick surrounding walls)
-Image 2: This bladder has gas bubbles that could be due to inflammation or infection from 'gas producing' bacteria.



Common prostate pathologies

1) Benign prostate hypertrophy





MCQ's

1) A man came to the hospital with fever and with suprapubic pain, CT image shows inflamed bladder having thick walls, what is the diagnosis?

A-Pyelonephritis
B-hydronephrosis
C-Cystitis
D-Tumor

2) A patient has hematuria, flank pain, without fever and after Investigations the doctor diagnosed the case with stones, what is the best imaging technique for diagnosis of stones?

A- CT without contrast
B- CT with contrast
C- MRI
D- US

3) A women in emergency due to a below abdomen trauma ,IVP was used. what is the most common diagnosis ?

A- stones
B- Urethral injury
C- Tumor
D- Pyelonephritis

4) A patient with flank pain, The doctor suspect Stones and CT was made,And hydronephrosis was found. where is the location of the stone?

A-Ureter
B-Urinary bladder
C-Kidney
D-Urethra

1.C 2.A 3.B 4.D

Team leaders:

 Nouran Arnous

 Omar Aldosari

إنّ الله يعطي أصعب المعارك لأقوى الجُنود فاستمر

Renal Block

Good Luck !

Radiology MED38