

Urologic Disorders

Mohammad Al Omar, MBBS, FRCSC
Assistant professor and Consultant Urologist
KKUH, KSU

Notes , imp !

Surgery team:

Badra'a Al-Muharib
Maha Al-Balharith , Bedoor Al-Qadrah

Urologic Disorders

- Urinary tract infections
- Urolithiasis
- Benign Prostatic Hyperplasia and voiding dysfunction

A) Urinary tract infections

Lower urinary tract: less morbid than Upper tract

- Urethritis
- Epididymitis/orchitis
- Prostatitis
- cystitis

Upper Urinary tract :

- Acute Pyelonephritis
- Chronic Pyelonephritis
- Renal Abscess

Pyelonephritis & Renal Abscess

Can lead to death So , it's serious condition

4 routes for UTI (MCQ!!)

1- ascending infection (95%)

2- Hematogenicity :

*tooth abscess > pyelonephritis How tooth infection goes to Kidney?

like in infective endocarditis. Bad mouth > bacteria goes to heart , and stay on valve.

*In past they used to see more Hematogenicity like in Tb> secondary TB in kidney.

3- adjacent invasion , imagine u have colon with diverticulum and diverticulum would rupture in bladder so u will have UTI

4- lymphatics (rare)

1- URETHRITIS

- Common in men
- S&S
 - urethral discharge
 - LUTS in form of Dysuria
 - burning on urination
 - Asymptomatic (25 %) specially in women

In young men usually the cause is sexual transmitted disease

- **Gonococcal vs. Nongonococcal**

DX: Diagnosis of the organism is established by :

- incubation period can tell what is the organism **MCQ!!**((gonococcal :3-10 days vs. Nongonococcal : 1-5 wks)
- Urethral swab and send it to culture to identify the proper antibiotics which affecting in organism
- Serum mark & antigen :Chlamydia-specific ribosomal RNA (usulley done in chronic form of disease)

Table 17–1. CLASSIC URETHRITIS

	Gonorrhea	Chlamydia
Organism	<i>Neisseria gonorrhoeae</i>	<i>Chlamydia trachomatis</i>
Organism type	Gram-negative diplococci	Intracellular facultative anaerobe
Incubation period	3–10 days	1–5 wk
Urethral discharge	Usually profuse, purulent	Usually scant
Asymptomatic carriers	40%–60%	40%–60%
Diagnostic test	Ligand chain reaction	Polymerase/ligand chain reaction
Other tests	Gram stain Culture	Culture Immunoassay
Recommended treatment	Ceftriaxone 125 mg IM once <i>plus</i> Azithromycin 1 g PO <i>or</i> Doxycycline 100 mg PO bid × 7 days	Azithromycin 1 g PO <i>or</i> Doxycycline 100 mg PO bid × 7 days
Alternative treatment	Cefixime 400 mg PO <i>or</i> Ciprofloxacin 500 mg PO <i>or</i> Ofloxacin 400 mg PO <i>plus</i> Azithromycin 1 g PO <i>or</i> Doxycycline 100 mg PO bid × 7 days	Erythromycin 500 mg PO qid 7 days <i>or</i> Erythromycin ethylsuccinate 800 mg PO qid × 7 days <i>or</i> Ofloxacin 300 mg PO bid × 7 days

*This table show u the differences b/w gonococcal urethritis (GU) and nongonococcal urethritis (NGU)

*The most common non specific urethritis is due to Chlamydia

	Gonorrhea	Chlamydia
organism	Nisseria gonorrhea	Chlamydia trachomatis
Organism type	Gram (-)	Intacellular organism
Incubation period	3-10 days	1-5 weeks
Urethral discharge	Profuse	Scant
Diagnostic test	PCR , Culture, Gram stain	PCR , Culture , Immunoassay
Treatment	Ceftriaxon + Azithromysin or Doxycyclin	Ceftriaxon or Azithromysin

the specification of
treatment properly
not ask in exam

2-Epididymitis

- Acute : pain, swelling, of the epididymis <6wk
- chronic :long-standing pain in the epididymis and testicle, usu. no swelling.

**Young male has urethritis not yet treated the consequences >blood flow up to urethra >go to ejaculatory duct > go to epididymis ... which means Epididymitis is caused by retrograde ascent of urinary pathogens from the urethra and bladder, via the ejaculatory ducts and vas deferens, leads to colonisation and inflammation of the epididymis

**It also effects children for ex) Young boy comes with bad testicular pain 2 condition to differentiate is:

1- testicular torsion > urological emergency .. pt should go to OR

2-Epididymitis

- DX

- Epididymitis vs. Torsion:

- U/S :

- In Epididymitis b/c of infection > hyperemia

- Torsion > no blood flow

- Testicular scan “ nuclear scan”

- in torsion there will be photopenia (white area) in opposite to epididymitis is black “hyperscan photogenic”

- Urine for culture:

- Younger : *N. gonorrhoeae* or *C. trachomatis*

- Older : *E. coli* (*gram-rods*)

How we can differentiate b\ t

Epididymitis vs. Torsion ?

Epididymitis	Torsion
From History :	
<ul style="list-style-type: none"> • Older patient • gradual onset • With urinary symptoms like burning sensation – hematuria” like pt may say dr I had blood in urine from 2 weeks “ 	<ul style="list-style-type: none"> • usually young boys, just reach the adolescent • acute pain – sudden in onset • Usually without urinary symptoms
From physical examination:	
<ul style="list-style-type: none"> • Inflammatory sign (redness-warmth and swelling of the scrotum) 	High raiding testis, testis is kidney shape , bean shape, Horizontal lay Loss of cremasteric reflex

*cremasteric reflex is elicited by lightly stroking the superior and medial (inner) part of the thigh. The normal response is a contraction of the cremaster muscle that pulls up the scrotum and testis on the side stroked.

Torsion if want examine is v. painful but in epididymitis raising scrotum make it better b/c of more drainage > Prehn's sign* pain relieved by elevation of the testicle

It's just a guide line that
show u what to be done

Table 17–3. TREATMENT OF ACUTE EPIDIDYMO-ORCHITIS

Epididymo-Orchitis Secondary to Bacteriuria

1. Do urine culture and sensitivity studies
2. Promptly administer broad-spectrum antimicrobial agent (e.g., tobramycin, trimethoprim-sulfamethoxazole, quinolone antibiotic)
3. Prescribe bed rest and perform scrotal evaluation
4. Strongly consider hospitalization
5. Evaluate for underlying urinary tract disease

Epididymo-Orchitis Secondary to Sexually Transmitted Urethritis

1. Do Gram stain of urethral smear
 2. Administer ceftriaxone, 250 mg IM once; then tetracycline, 500 mg PO qid for at least 10 days, or doxycycline, 100 mg PO bid for at least 10 days
 3. Prescribe bed rest and perform scrotal evaluation
 4. Examine and treat sexual partners
-

Adapted from Berger RE: Urethritis and epididymitis. *Semin Urol* 1983;1:143.

3-Prostatitis

Prostate : constitute about 80% of the semen

- Syndrome that presents with inflammation± infection of the prostate gland including:
 - Dysuria, frequency
 - dysfunctional voiding
 - Perineal pain
 - Painful ejaculation

Difficult to treat b\c the capsule
& configuration of prostate
You may give antibiotics for
months

The root of ascending infection may go through ejaculatory duct to prostate and that's why some people gets the infection.

We are not required to know the categories of prostatitis , just showing that there's more than one thing , some of it is due to bacteria , and some of it is not due to bacteria and we fail to isolate bacteria when doing urine culture .

Table 15–1. CLASSIFICATION SYSTEM FOR THE PROSTATITIS SYNDROMES

Traditional	National Institutes of Health	Description
Acute bacterial prostatitis	Category I	Acute infection of the prostate gland
Chronic bacterial prostatitis	Category II	Chronic infection of the prostate gland
N/A	Category III chronic pelvic pain syndrome (CPPS)	Chronic genitourinary pain in the absence of uropathogenic bacteria localized to the prostate gland with standard methodology
Nonbacterial prostatitis	Category IIIA (inflammatory CPPS)	Significant number of white blood cells in expressed prostatic secretions, postprostatic massage urine sediment (VB3), or semen
Prostatodynia	Category IIIB (noninflammatory CPPS)	Insignificant number of white blood cells in expressed prostatic secretions, postprostatic massage urine sediment (VB3), or semen
N/A	Category IV asymptomatic inflammatory prostatitis (AIP)	White blood cells (and/or bacteria) in expressed prostatic secretions, postprostatic massage urine sediment (VB3), semen, or histologic specimens of prostate gland

- Acute Bacterial Prostatitis :

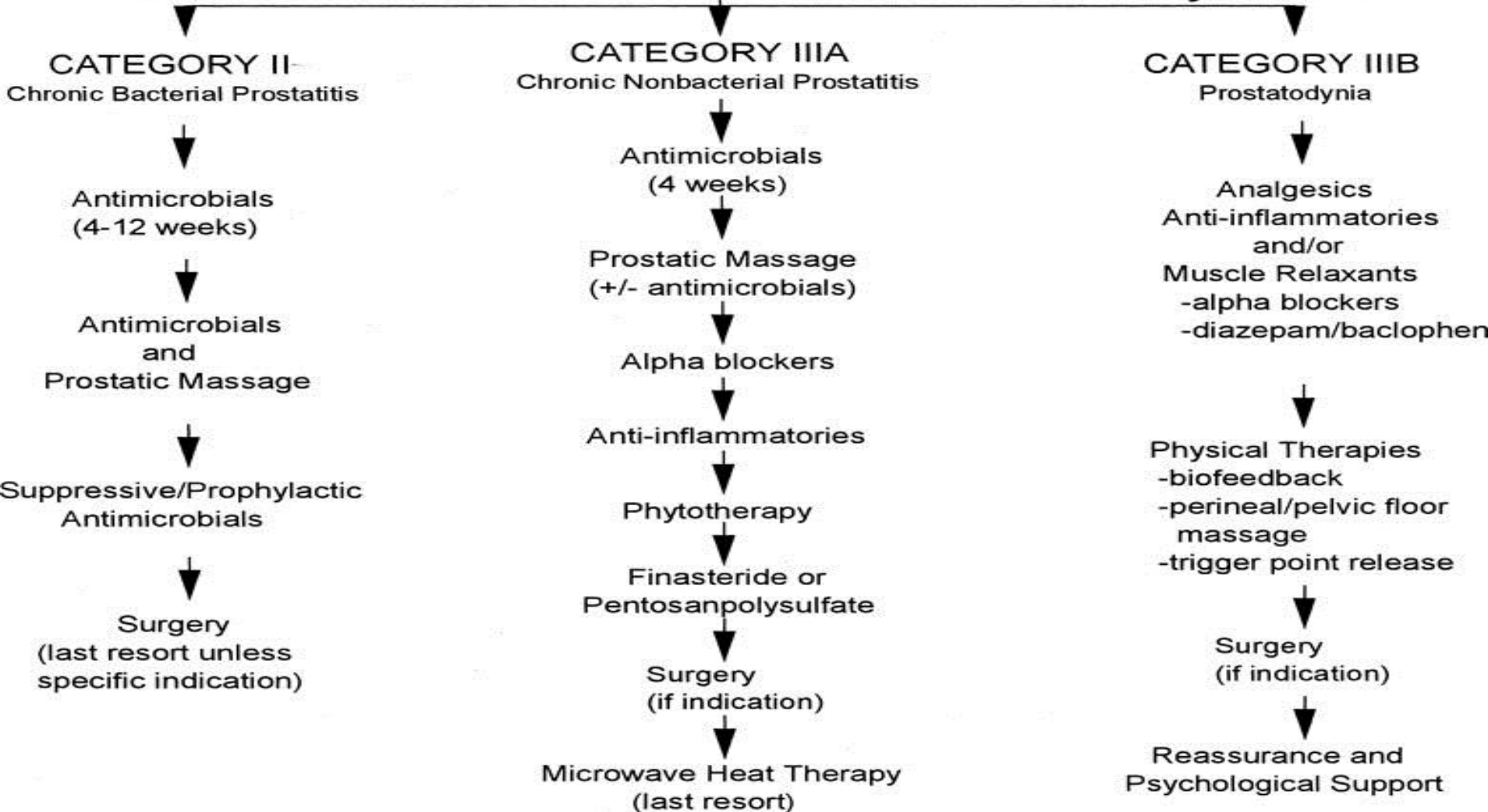
Patient should get admitted b/c it's a serious problem he may get hypotension 90/40 (urosepsis – septic shock)

it's a rare clinical emergency condition that maybe life threatening
MCQ BUT chronic prostatitis is seen more commonly .

- Rare
- Acute pain
- irritative and obstructive voiding symptoms
- Fever, chills, malaise, N/V
- Perineal and suprapubic pain
- Tender swollen hot prostate.
- Rx : Abx and urinary drainage

This schedule shows us how to treat prostatitis

Chronic Prostatitis/Chronic Pelvic Pain Syndrome



4-cystitis

- Common in women then men, why?
b/c women have shorter urethra 4.5 cm, some of them has genetically predisposed to bacteria their lining of bladder is more susceptible to E.coli تلصق فيها
- **S&S:**
 - **dysuria, frequency, urgency, voiding of small urine volumes,**
 - **Suprapubic /lower abdominal pain**
 - \pm Hematuria
- **-No fever even if it's sever**
 - *When will we get fever ?
If the bacteria ascended & reached the kidney then we will have pyelonephritis .
 - *Some women will ignore their feeling of dysuria and they come to emergency with urosepsis .
- **DX:**
 - Dip-stick when nitrate is (+) then it indicate an infection
 - urinalysis
 - **Urine culture** [is the gold standard] **MCQ!!** It takes 2 days We start treatment before waiting for results b/c we know what the commonest infection

Usually treatment of UTI in women just for 3 days
To avoid any affect on normal bowel flora..
In men, usually for a week

Table 14–10. TREATMENT REGIMENS FOR ACUTE CYSTITIS

Circumstances	Route	Drug	Dosage (mg)	Frequency per Dose	Duration (days)
Women					
Healthy	Oral	Ciprofloxacin	500	Every 12 hr	3
		Enoxacin	400	Every 12 hr	
		Levofloxacin	500	Every day	
		Lomefloxacin	400	Every day	
		TMP-SMX	160–800	Every 12 hr	
		TMP	100	Every 12 hr	
		Microcrystalline nitrofurantoin	100	Four times a day	
		Norfloxacin	400	Every 12 hr	
Symptoms for >7 days, recent urinary tract infection, age >65 yr, diabetes, diaphragm use		TMP–SMX	160–800	Every 12 hr	7
Pregnancy		or	As above	As above	
	Oral	Fluoroquinolone			
		Amoxicillin	250	Every 8 hr	7
		Cephalexin	500	Four times a day	
		Microcrystalline nitrofurantoin	100	Four times a day	
		TMP-SMX	160–800	Every 12 hr	
Men					
Healthy and <50 years old	Oral	TMP-SMX	160–800	Every 12 hr	7
		or			
		Fluoroquinolone	As above	As above	

TMP, trimethoprim; TMP-SMX, trimethoprim-sulfamethoxazole.

Modified from Stamm WE, Hooton TM: Management of urinary tract infections in adults. N Engl J Med 1993; 329: 1328–1334. Copyright 1993 Massachusetts Medical Society. All rights reserved.

5-Pyelonephritis

- Inflammation of the kidney and renal pelvis
- S&S :
 - Chills
 - Fever
 - Costovertebral angle tenderness (flank Pain) MCQ
 - GI:abdo pain, N/V, and diarrhea
 - Gr-ve sepsis-mild flank pain
 - Dysuria, frequency

- Investigation:

- Urine dip stick , microscopy> to get rapid results.
- Urine C&S (culture & sensitivity) :+VE(80%)
 - *Enterobacteriaceae (E. coli), Enterococcus*
- Urinalysis:↑ WBCs, RBCs,Bacteria
- Blood test for renal function : (±) ↑serum Creatinine
- CBC : Leukocytosis **MCQ!**

In culture The most common organism we see in pyelonephritis is gram (-) rods E.Coli followed by enterococcus species **MCQ!!**

- Imaging: just to rule out any possible obstruction
- IVP (intravenous pyelogram)
- U/S (Ultrasound)
- CT

*pyelonephritis complicated by obstruction *renal stones , ovary cancer blocked the kidney* .. in this case we have to drain kidney not only give antibiotic b/c there is collection of pus by putting tube in kidney”

Nephrostomy Tube” under local anesthesia >use it in obstructive infective kidney especially if pt very sick

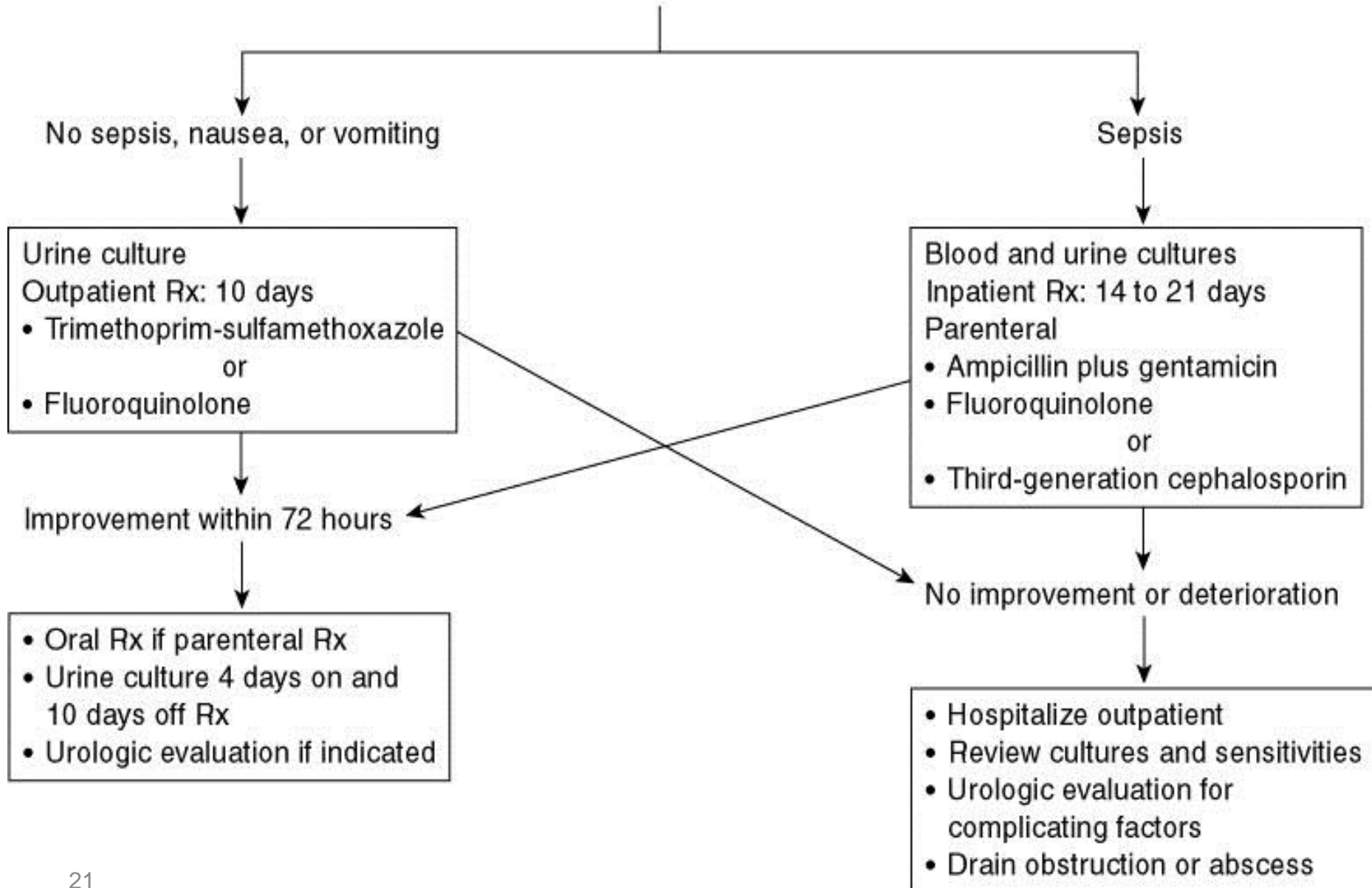
- In U/s we will see hydronephrosis , kidney dilated

*Other option if patient is better than the first example we can do "Double J" which is tube placed inside the ureter during surgery to ensure drainage of urine from the kidney into the bladder .. Stent is temporally treatment to bypass the blockage > b/c if we manipulate the stones the pt may have bacteremia and die مانحب نحرك شي الين

😊الانفكيشن يروح

Symptoms and Signs of Pyelonephritis
(Fever, Flank Pain, Leukocytosis)

It's just a guide line



B) Urolithiasis

the condition associated with urinary calculi.

- Common disease in Saudi Arabia
- Egyptian mummies 4800 BC
- Prevalence of 2% to 3%,
- Life time risk: Male : 20%, female 5-10%
- Recurrence rate 50% at 10 years

- Risk factors:
 - **Intrinsic Factors**
 - **Genetics** eg. Cystinuria and it's an autosomal recessive disease (so affect the kids & in general if not treated “it's hard to tell kid drink water” it can lead to death b\c of the complication like kidney failure ,when u do transplantation for them new kidneys >the disease is gone)
 - **Age (20s-40s)** young people
 - **Sex** M>F

Other risk factors u don't have to remember

- **Extrinsic Factors**

- *Geography* (mountainous, desert, tropics)
- *Climate* (July - October)
- *Water Intake*
- *Diet* (purines , oxalates, Na) .
- *Occupation* (sedentary occupations)

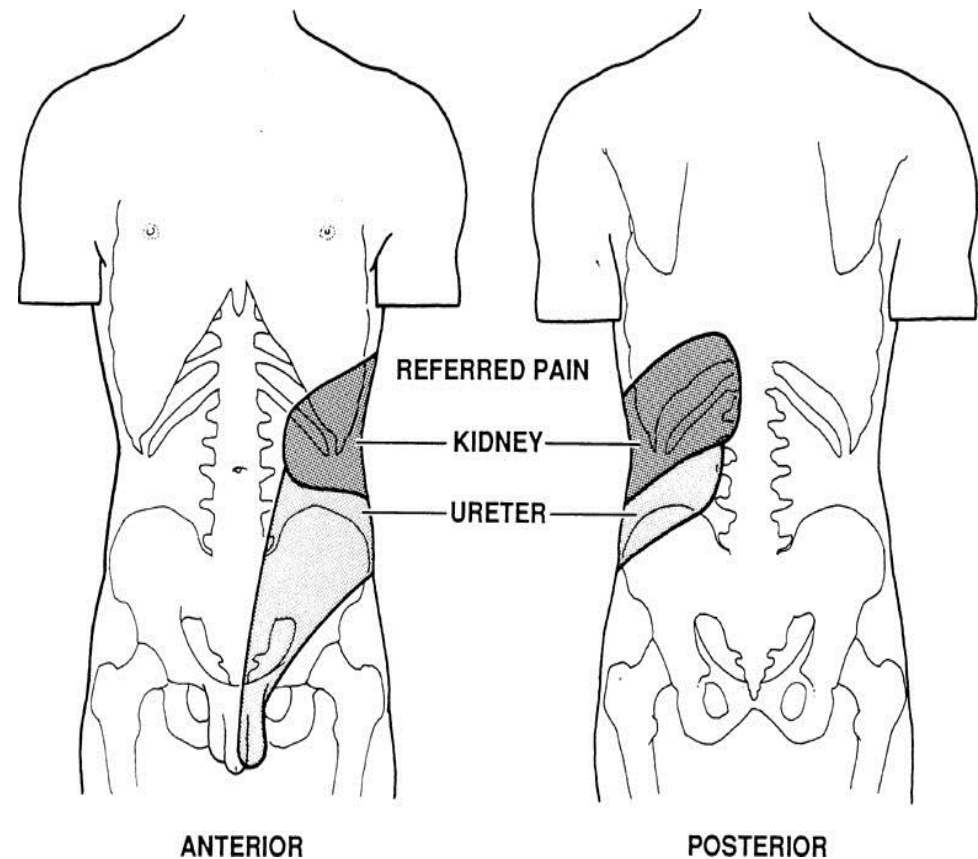
- **How do stones form**

- Supersaturated (doesn't drink water) → solute will Concentrate → Crystal Growth
- Aggregation of crystals → stone

- **Most people have crystals in their urine, so why not everyone gets stones?**
 - **Anatomic abnormalities** : Presence of cretin abnormalities of the urinary tract like hydronephrosis or obstruction in the urinary tract lead to stasis (stoppage) of the urine and then supersaturating of minerals that eventually leads to formation of stones
 - **Modifiers of crystal formation: Inhibitors/promoters**
 - Citrate, Mg, urinary proteins(nephrocalcin) are inhibitors for stone formation
 - Oxalate is promoter for stone formation such as (coffee , chocolate, soda drinks except some of them which has also citrate that will decrease stones)

- Common stone types **MCQ!!!**
 - Calcium stones 75% **!!**
 - (ca Ox) calcium oxalate (common)
 - Uric acid stones : uric acid found in animal protein & it's the commonest cause of radiolucent kidney stones.
 - Cystine stones: Cystine is an amino acid remember them by COLA : cystine, oxaline , lysine and arginine ; the proximal tubules are unable to reabsorb these amino acids , all of them are water soluble except Cystine that's why it forms stones. **MCQ!!**
 - Struvite stones

- S&S
 - Renal or ureteric colic
 - Freq, dysuria
 - Hematuria
 - GI symptoms: N/V, ileus, or diarrhea
 - DDx :
 - Gastroenteritis
 - acute appendicitis
 - colitis
 - Salpingitis



- Cont. S&S

- Restless MCQ

- ↑HR, ↑ BP
 - fever (If UTI)
 - Tender CVA costvertebral angle. the renal angle is very tender in pyelonephritis, less tender in renal stones , and not tender in appendicitis.

This is a common OSCE exam theme

Take a history of renal colic ??

So u have to memories the signs and symptoms .

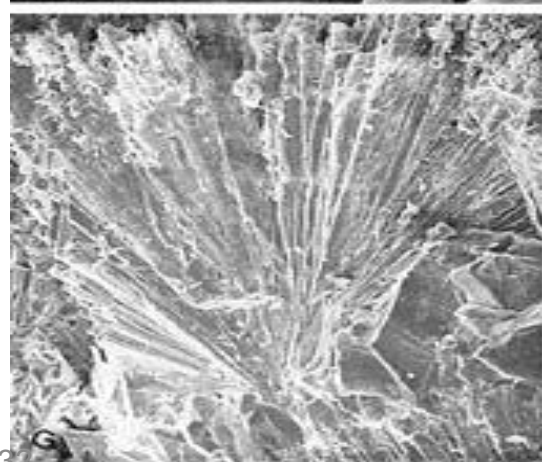
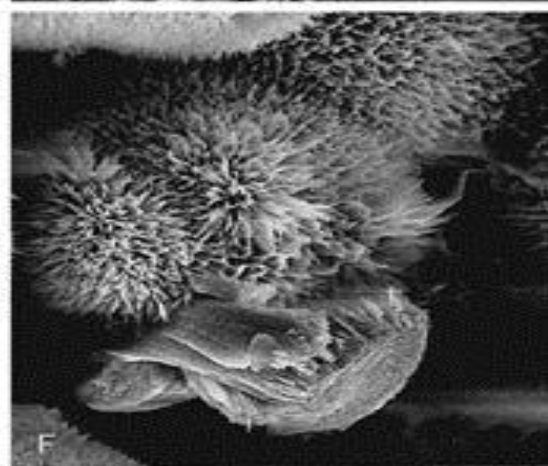
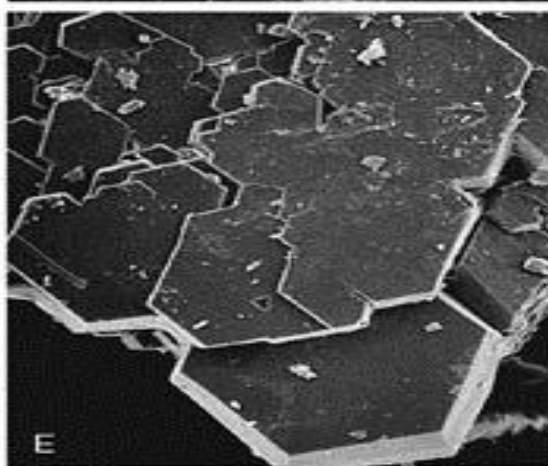
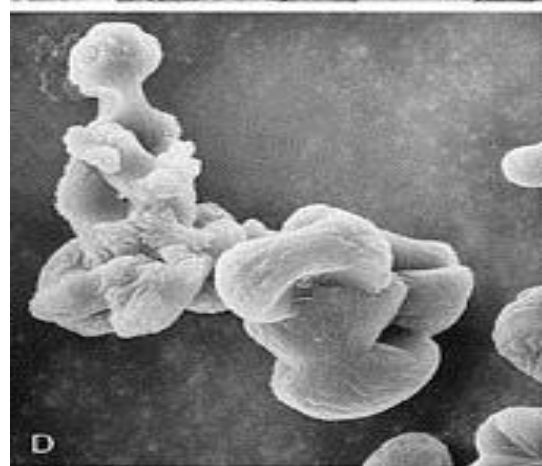
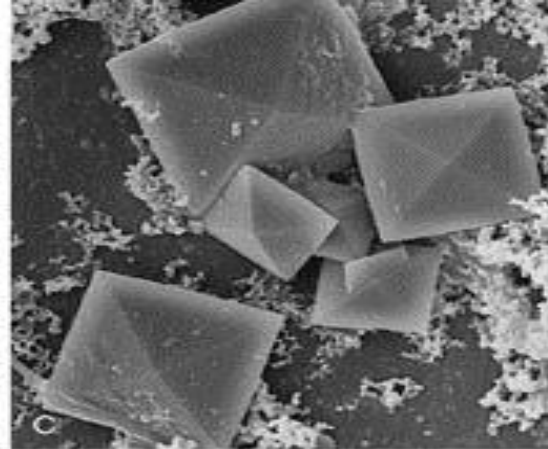
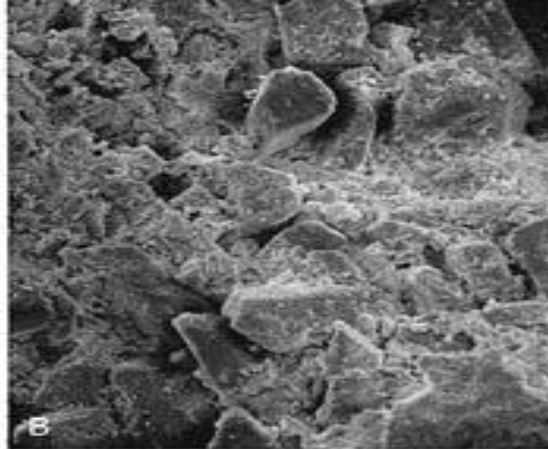
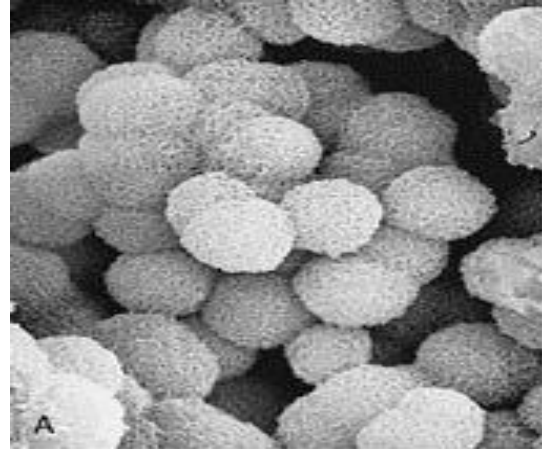
So renal colic comes with **flank pain** so u should ask about PAIN which has 8-10 questions u should cover.

And when you take Hx of renal colic u should have some differential diagnosis for **flank pain** such as :

- If pain worse with bowing and improve by lying down >MSK pain
- If the pain radiate to right or left lower quadrant – renal stone
- Radiate to labia in women and to scrotum in men – renal stone
- Pain when cough – Cholecystitis
- Pain with movement and goes to leg – prolapsed disk (cystica)
- is the pain comes after eating – cholecystitis and may also vomit
- The pain is in the pre-umbilicus then goes to the right lower quadrant - appendicitis
- Young married female with Hx of no period for 2 months – ectopic pregnancy

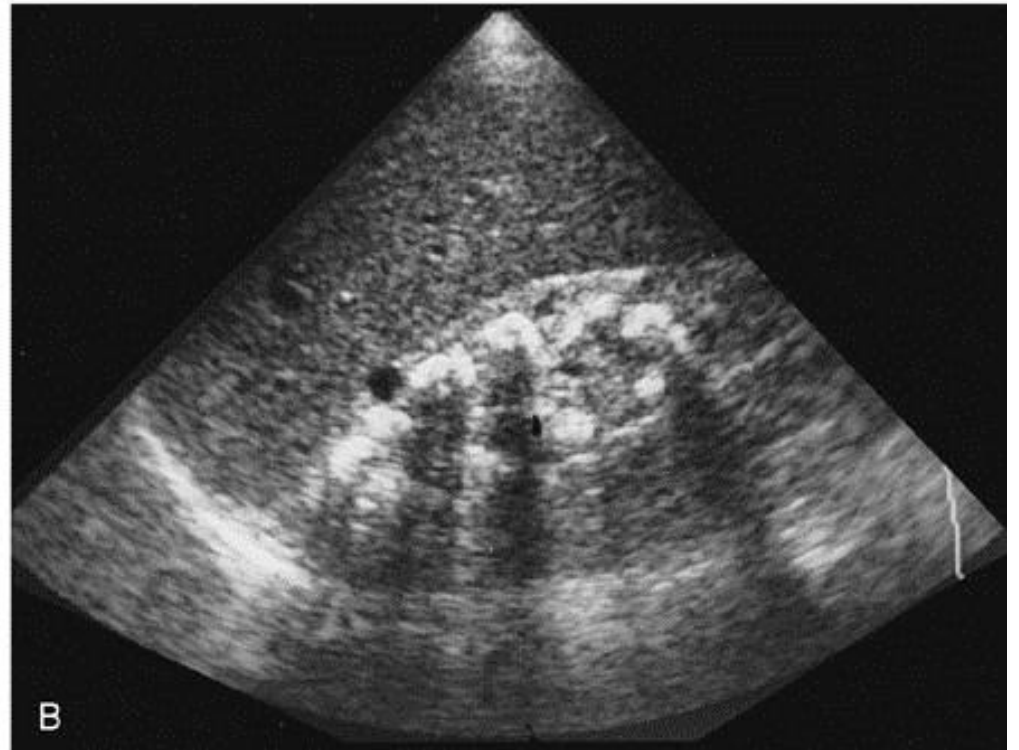
Investigation

- ***Urinalysis :***
 - RBC
 - WBC
 - Bacteria
 - Crystals

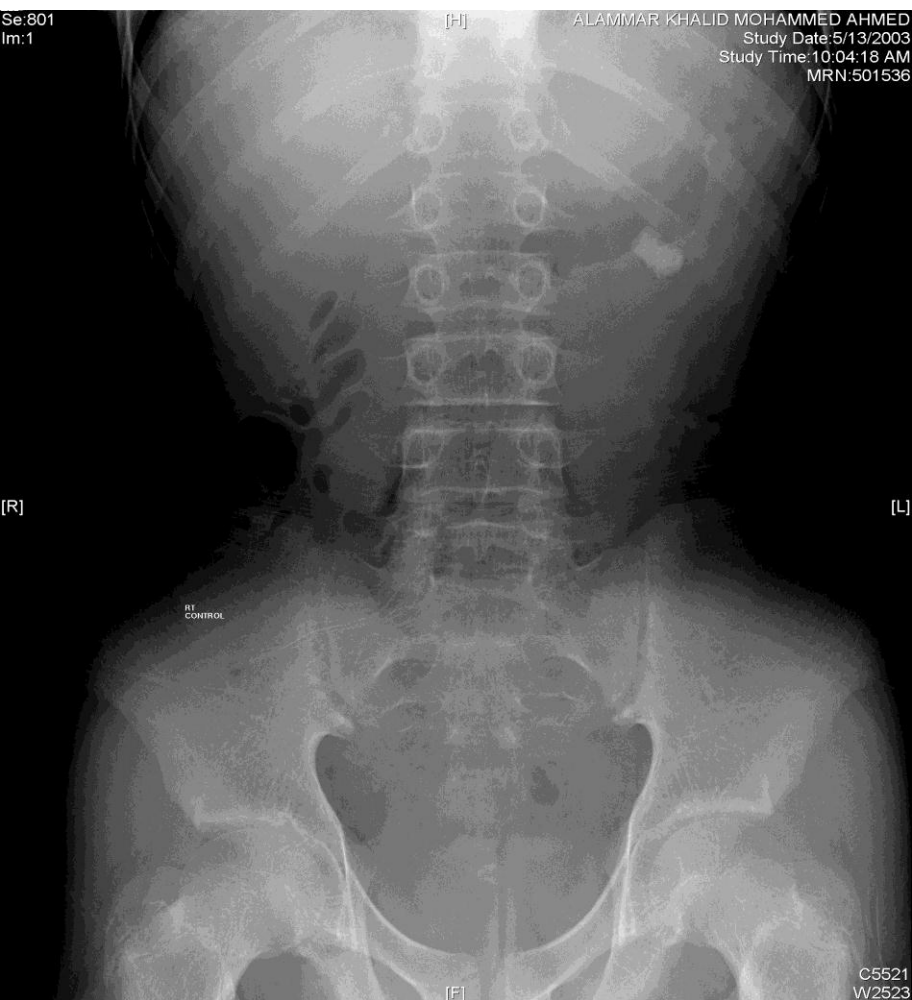


Investigation

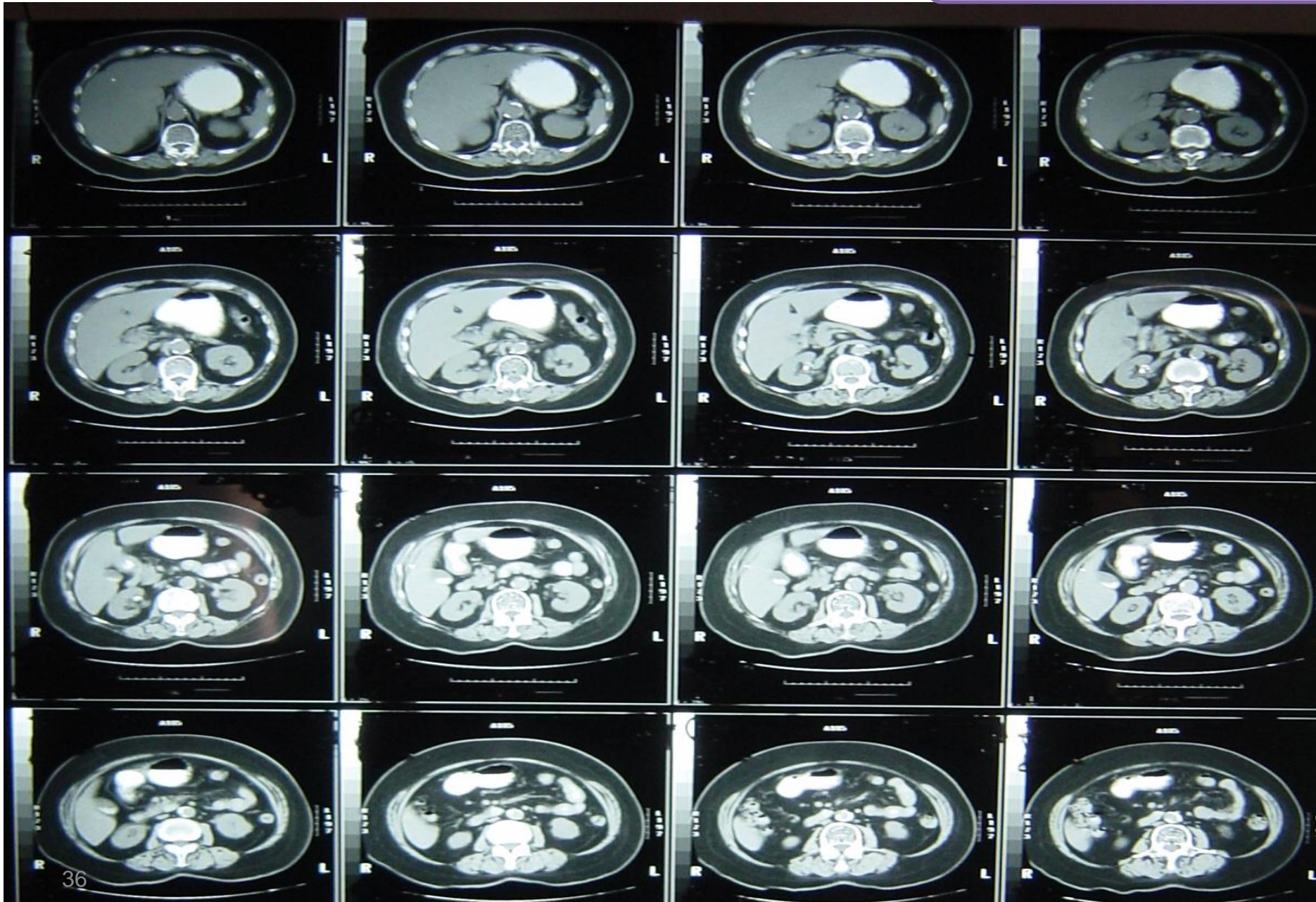
- Imaging
 - Plain Abdominal Films (KUB) shows only radiopaque stones
 - Intravenous Urogram (IVP) shows radiolucent (uric acid stone) & radiopaque stones “calcium stones”
 - Ultrasonography (U/S) shows*hyperechoic stones+ acoustic shadow*.
 - **Computed Tomography (CT)** is the gold standard most sensitive and specific & shows the radiolucent stones so it's first step.



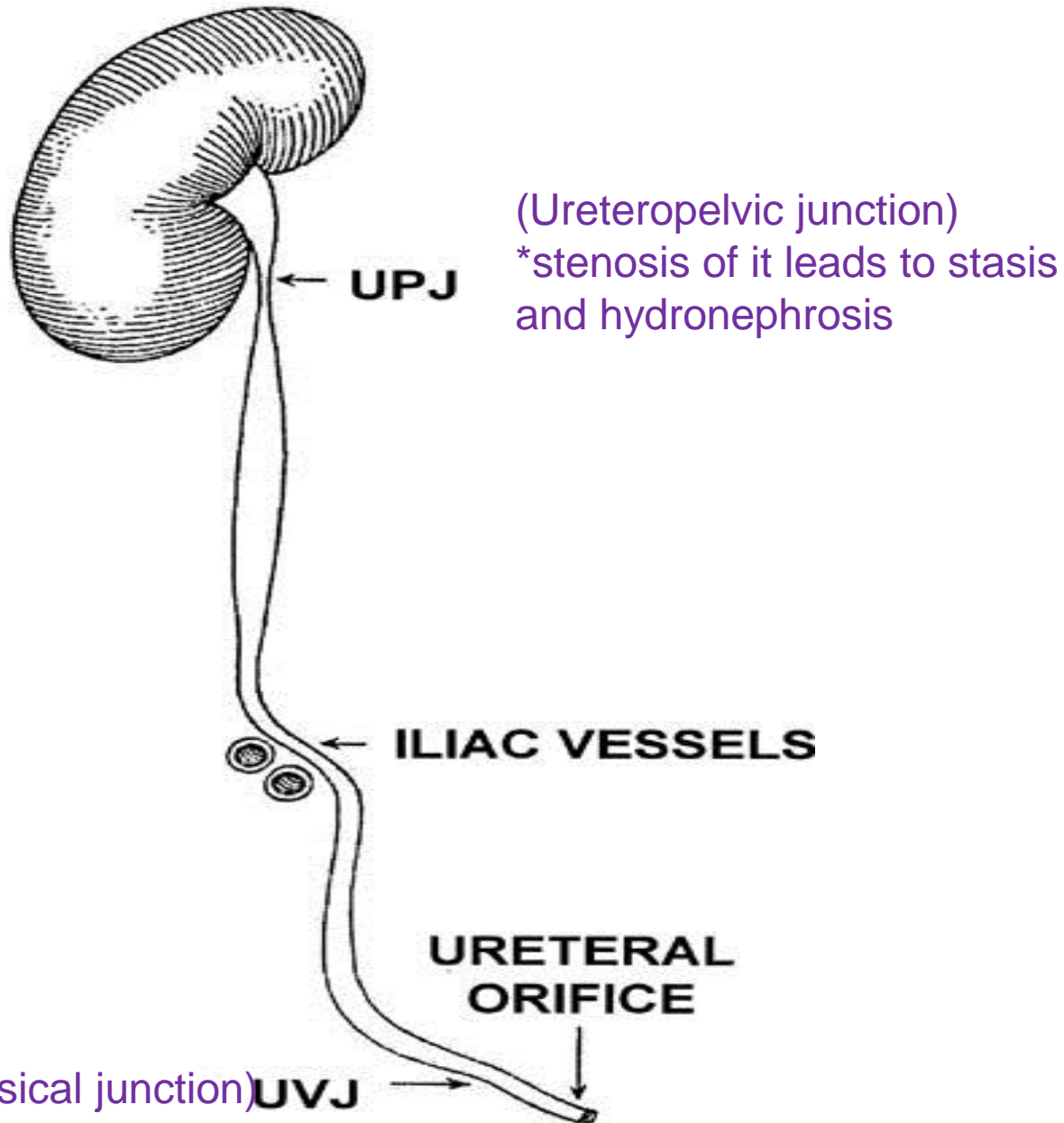
In case of high grade obstruction u may stay 2 days without
see something !!



All stones will show in CT



Normal 3 narrowing in Ureter



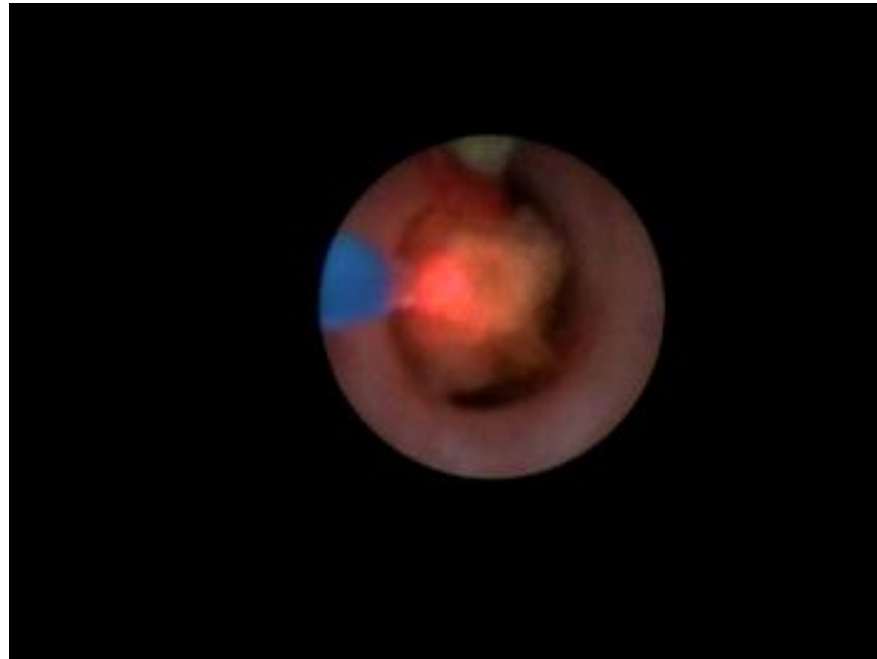
Management

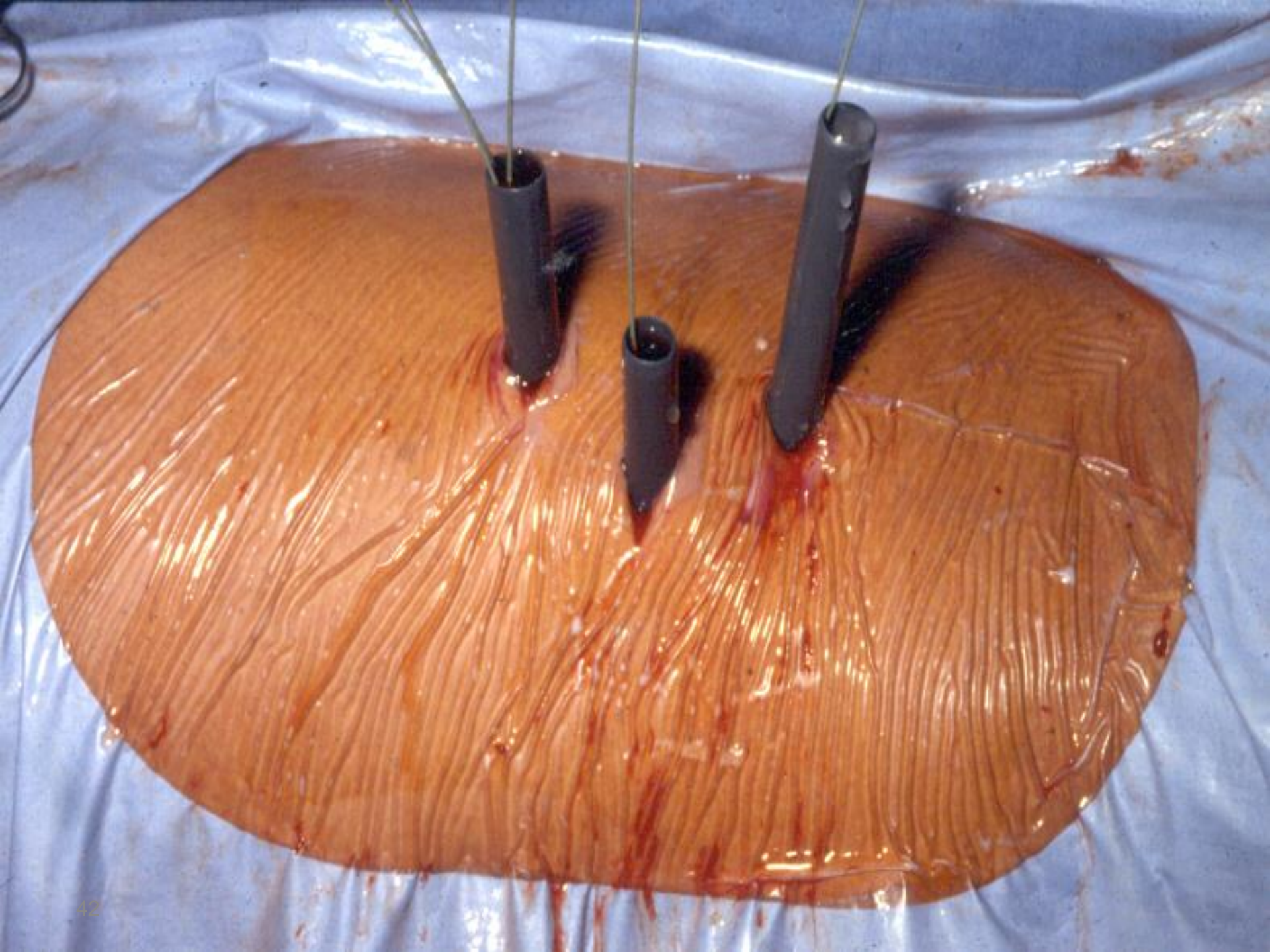
- Conservative
 - Hydration
 - Analgesia
 - Antiemetic
 - Stones (<5mm) >90% spontaneous Passage
- Indication for admission
 - Renal impairment
 - Refractory pain
 - Pyelonephritis (pt has 3 mm stones with fever and chills >pyelonephritis)
 - intractable N/V > can't take oral analgesia

Management

- Shock Wave lithotripsy (SWL) :good for kidney stones and small stones, potential injury to ovary!!
- Ureteroscopy :breaks the big stone by a laser
- Percutaneous Nephrolithotripsy (PNL) :for huge stone
- Open Sx :not used anymore







C) Voiding Dysfunction

- ***Failure to store***

- Bladder problems
 - Overactivity common in women or b/c of spinal cord injury , stroke > loss of control by causing damage to micturition inhibitory center.
 - Hypersensitivity
- Outlet problem
 - Stress incontinence , With pregnancies and deliveries the pelvic wall muscles is gone ,, the support is gone so with little increase abdominal pressure >leak
 - Sphincter deficiency

- ***Failure to Empty***

- Bladder problems
 - Neurologic
 - Myogenic
 - idiopathic
- Outlet problem
 - BPH Benign prostatic hyperplasia
 - Urethral stricture
 - Sphincter dyssynergia
- combination

D) Benign Prostatic Hyperplasia

- Clinically:
 - LUTS(Irritative/Obstructiv)
 - poor bladder emptying
 - urinary retention
 - urinary tract infection
 - Hematuria,
 - Renal insufficiency

- Physical Examination
 - 1-DRE (digital rectal examination) MCQ if it's hard palpable nodules means Cancer
 - 2- Focused neurologic exam
 - Prostate Ca
 - rectal Ca
 - anal tone
 - neurologic problems
 - Abdomen: distended bladder MCQ

- Urinalysis , culture
 - UTI
 - Hematuria
- Serum Creatinine
- Serum **Prostate-Specific Antigen**, it maybe high in prostatic cancer
- Flow rate
- u/s

- Treatment options

- medical therapy

- α -Adrenergic Blockers > selective $\alpha 1$ blocker that opens the prostate

- Tamsulocin
 - Alfuzocin
 - Terazosin

- Androgen Suppression * 5α reductase inhibitor* >shrink prostate 60% in 6 months

- Finasteride

- Surgical Rx
 - Endoscopic (e.g. TURP, laser ablation)
Cut adenoma that's blockage the passage
 - Open SX

MCQs

1-irriative Urinary tract symptoms include all of the following excepy:

A)Dysuria

B) Hesitancy

C)Frequency

D)Uregency

2-Main causative organism for UTI is:

A) E.coli

B)Chlamydia

C)protus

D) Gonorrhea

3) The main symptoms of pyelonephritis are:

Fever

Flank pain

Chills

All of above

4) the most common type of urinary tract stones is:

A)calcium stones

B) uric acid stones

C) Cystine stones

D) struvite stones

5- All of the following true about epididymitis except:

A)it takes days or weeks to develop

B) can be diagnosed by US

C)Dysuria and pain are the main complain

D) Testicular scan reveals ischemia of the testicals