Haematuria

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What is Haematuria?

- Red cells in urine

- May be,

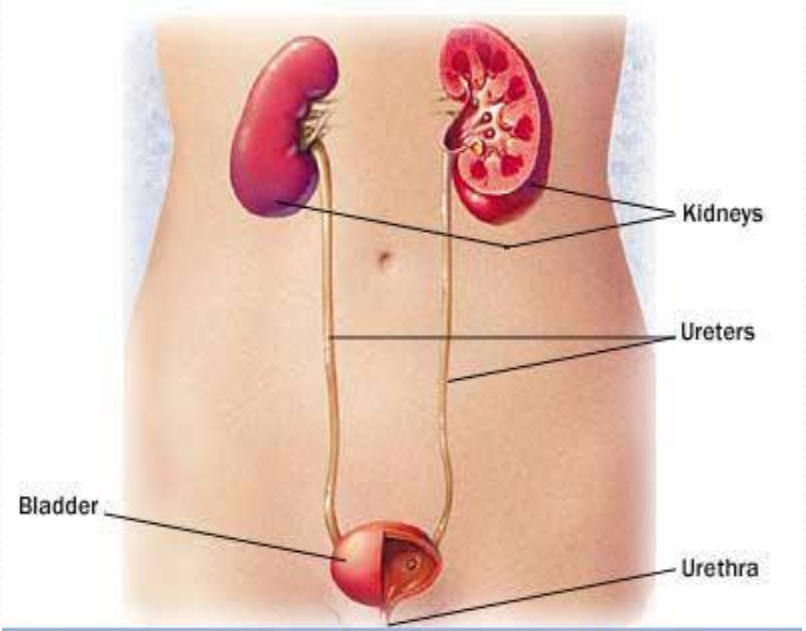
  overt (bloody urine) → macroscopic

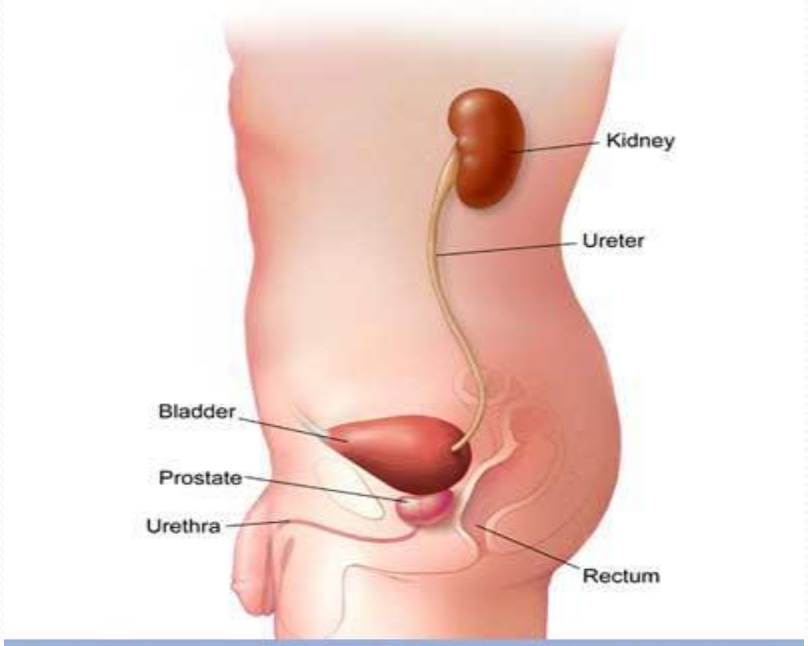
  found on chemical testing (dipstick) → microscopic

- >3 RBC/hpf

Causes of Haematuria

- Glomerular
- Non-glomerular (Tubulo-Interstitial)
- Extra-renal





Glomerular Causes

- **Glomerulonephritis**

  IgA nephropathy / Henoch-Schönlein purpura

  Lupus nephritis

  Post-streptococcal glomerulonephritis

- Haemolytic uraemia

Tubulo-Interstitial Causes

- Acute tubular necrosis
- Familial - polycystic kidney disease
- Infection - pyelonephritis, tuberculosis
- Interstitial nephritis
  - Drug induced - penicillins, cephalosporins
- Renal cell carcinoma
- Vascular disease – sickle cell disease

Extra-Renal Causes

- Benign prostatic hypertrophy
- Calculi
- Coagulopathy
- Drug induced (warfarin, heparin)
- Secondary to systemic disease
- Congenital abnormalities
- Infection - prostate, epididymis, urethra, bladder
- Inflammation – drugs/radiation
- Trauma - catheterization, blunt trauma
- Tumour - TCC

Colour of Urine as Guide to Location of Bleed

- Blood at start of voiding, then urine becomes clear → from urethra
- Blood diffusely present thru'out void → from bladder or above
- Blood only at end of voiding → from prostate or bladder base

Evaluating “Reddish Urine”

- Is it really blood?

  Drugs (Rifampicin), Beetroot

- Is it harmless?

  Exercise, menstruation, intercourse, factitious

- Is it painful or painless?

- Is it a Nephrological or Urological problem?

Painful Haematuria

- Pyelonephritis
- Calculi
- Infarction
- Obstruction

Painless Haematuria

- Glomerulonephritis
- ATN
- Interstitial nephritis
- Tumours
- Bleeding disorders

Urological Causes of Haematuria

- Calculi
- Tumours
- Trauma
- Obstruction – enlargement of prostate

Haematuria is a significant finding that requires further evaluation!

- Macroscopic – **all adults** need evaluation
- Microscopic –

  exclude menstruation, UTI, etc

  repeat urinalysis in 2 weeks

  if still positive → evaluate

Evaluating Haematuria – History I

- Duration of current episode
- Progress of bleeding
- Clots or fleshy pieces
- History of similar episodes
- UTI symptoms → dysuria, fever, pain
- LUTS → Voiding (hesitancy, slow stream, intermittency)
  Storage (frequency, nocturia, urgency, urge incontinence)
  Post-micturition (incomplete emptying, dribbling)
- Females – LMP, regularity of periods
- Joint pain, rashes, recent febrile episode

Evaluating Haematuria – History II

- Past History of urinary tract,
  - disease
  - surgery
  - calculi
  - irradiation
  - tuberculosis
- Social History - smoking
- Occupation History – dye, petroleum
- Drug History – Aspirin, Clopidogrel, Warfarin

Evaluating Haematuria – Examination

- Pallor
- Rashes, arthritis, alopecia
- Abdomen – renal masses, pelvic masses, bladder dullness
- Genitalia – urethra & vagina in females
  penile urethra for lumps, glans, external meatus
  rectal exam in men

Accompanying Symptoms

- **Haematuria with colic**

  renal stone, ureteric stone

  dysuria, micturition pause or straining to void - bladder or urethral stone

- **Haematuria with urinary frequency, urgency and dysuria**

  bladder or lower urinary tract (infection, tuberculosis or tumor)

  high spiking fever, chills and loin pain - pyelonephritis

- **Haematuria with oedema and hypertension**

glomerulonephritis

hypertensive nephropathy

- **Haematuria with mass in lumbar area**

neoplasm

hereditary polycystic kidney

- **Haematuria with skin & mucosal haemorrhages**

hematological disorders

infectious diseases

- **Haematuria with chyluria**

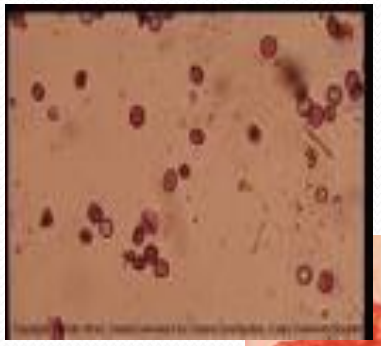
filariasis

Investigating Haematuria – Blood & Urine

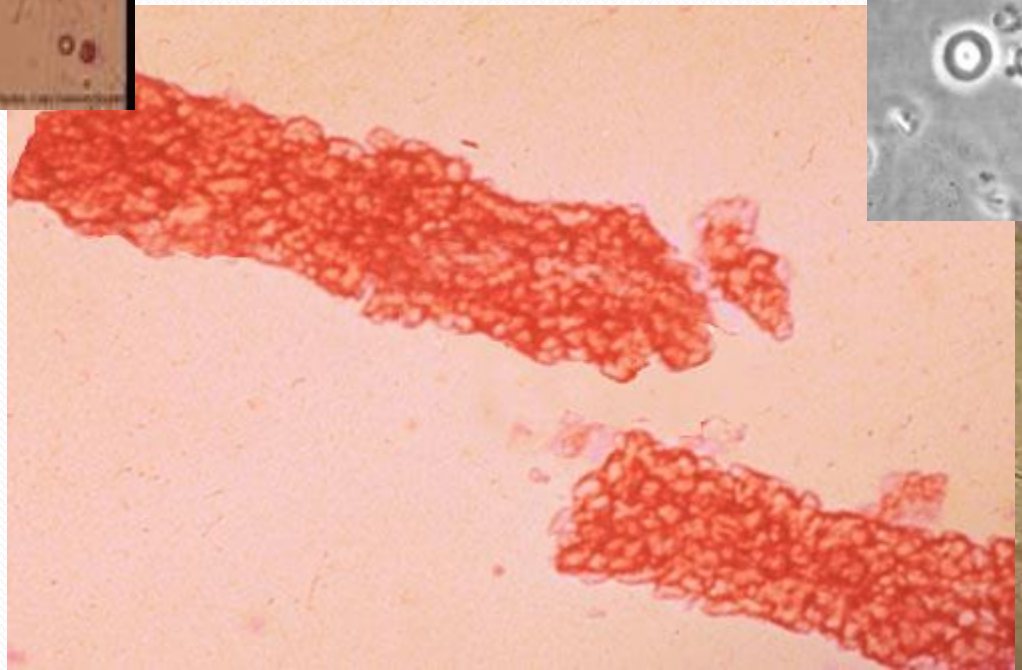
- (Dipstick urine analysis)
- Urine microscopy for casts, dysmorphic RBC
- Urine culture & ABST
- 24 hour urine protein
- Serum creatinine
- Full blood count
- PSA in males >50 yrs if CA prostate is suspected

Urine

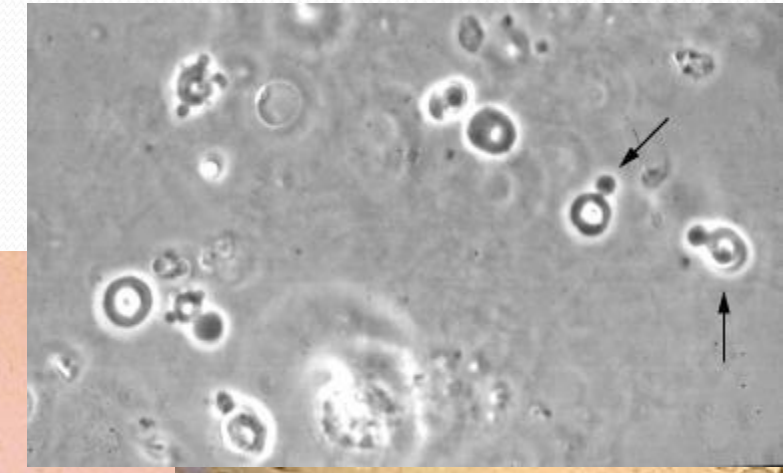
RBC

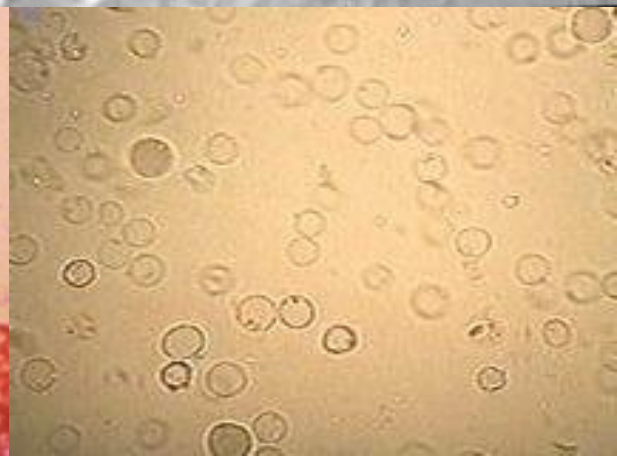


RBC Casts



Dysmorphic RBC





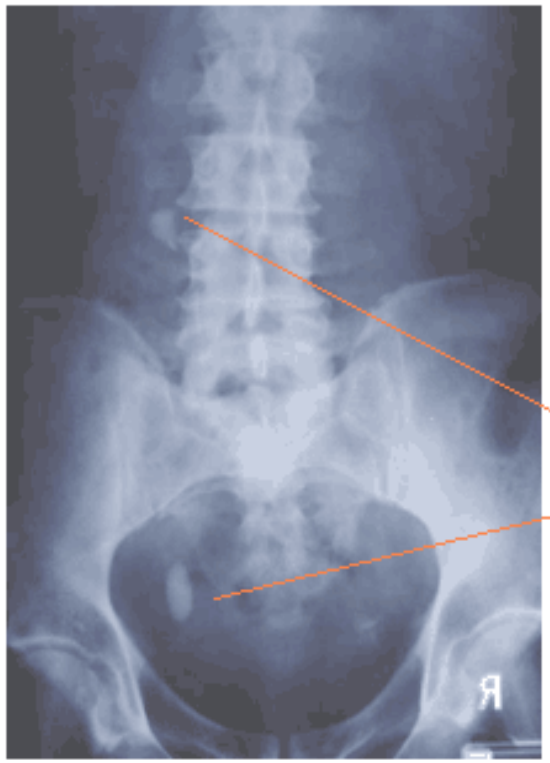
Investigating Haematuria – Imaging

- X-Ray KUB
- USS KUB
- IVU - calculi
  pelvic & ureteric urothelial tumours
  negative X-ray & USS KUB
- Optional - CT
  MRI
  Retrograde & Antegrade Pyelography

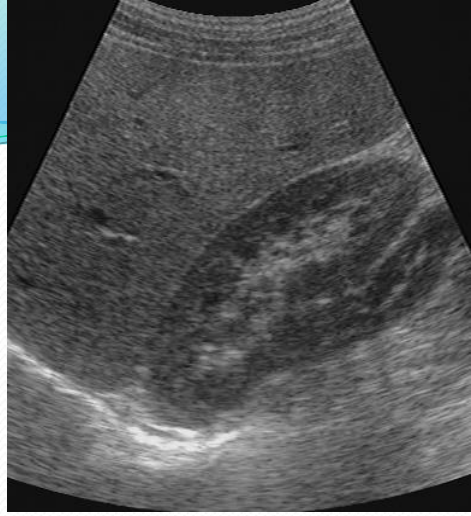
X-Ray KUB

- Shows 90% of calculi

  (10% of calculi are radio-luscent)



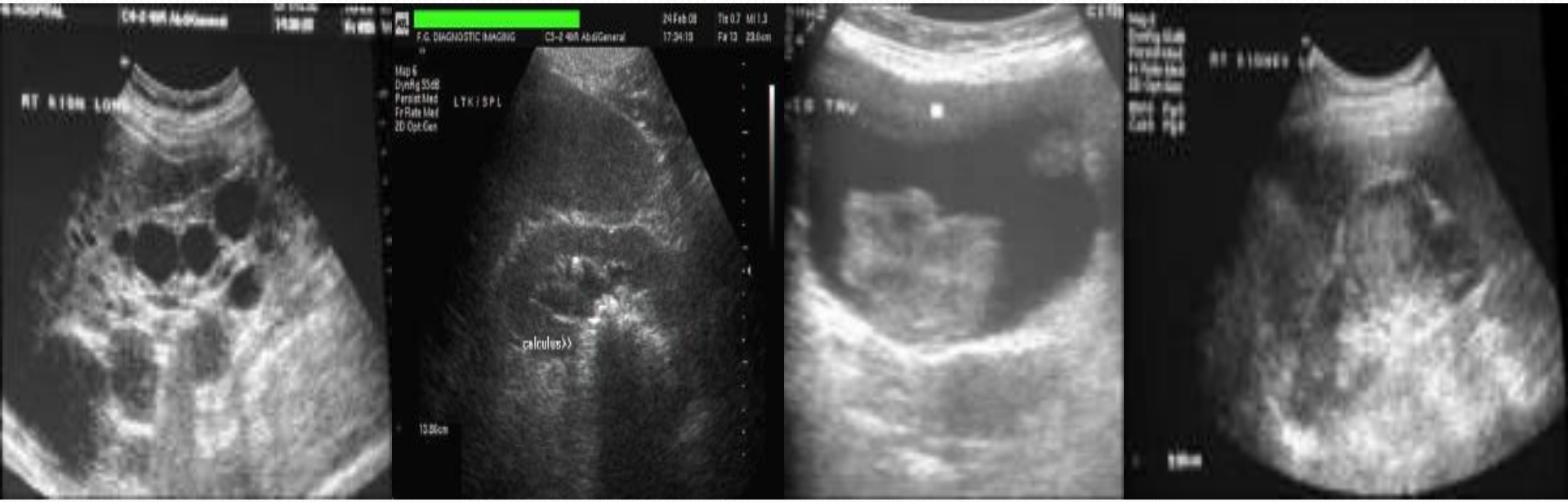
USS KUB



- Operator-dependant
- Non-invasive
- Detects - renal tumours >2 cm
  calculi
  SOL in renal pelvis (stones, tumours, clots)
  bladder CA & calculi

USS KUB

- Multiple cysts
- Staghorn calculus
- TCC in bladder
- Renal cell CA

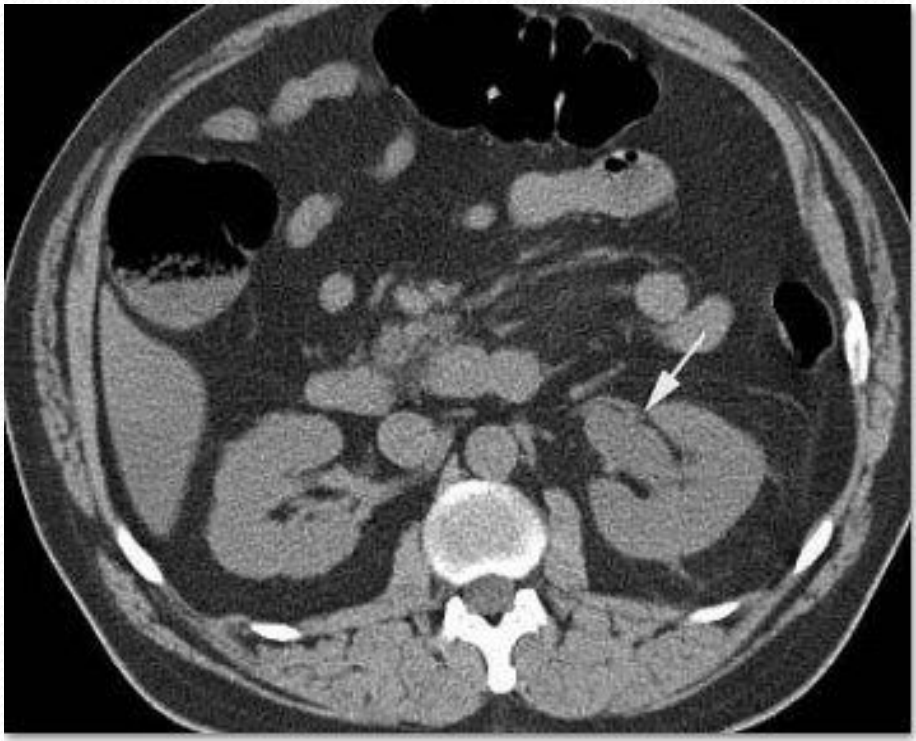


IVU

- Visualize entire urinary tract
- Information on function & anatomy

CT Scan

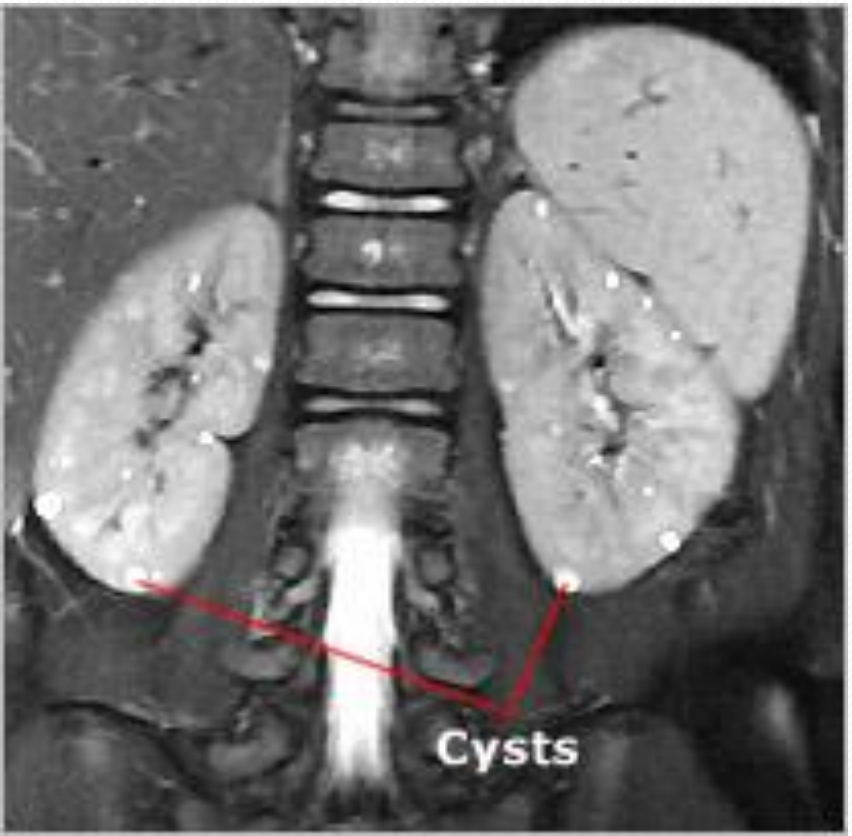
- Determines nature & effects of renal masses
- Non-contrast spiral CT more sensitive than IVU to detect calculi



MRI

- Shows soft tissue clearly

  ie. to differentiate cyst from neoplasm



Investigating Haematuria – Cystoscopy

- Any patient >40 y with haematuria is assumed to have CA bladder until proven otherwise

- For all patients >40 y

  patients <40 y with negative imaging or imaging shows bladder/upper UT tumour

When to Refer to a Nephrologist

- Significant proteinuria
  (>1g/24 hrs or >0.5g/24 hrs if persistent or increasing)
- Renal impairment on biochemistry
  (s.creatinine elevated)
- Evidence of glomerular bleeding
  (dysmorphic RBC or RBC casts)
- Other evidence of nephrological disease, hypertension or diabetes

Summary

- Haematuria is common
- Confirm blood in urine
- Exclude harmless causes
- Painful or Painless?
- Nephrological or Urological?
- Urine & blood tests
- Imaging

PBL Question

- *Case I*

A 56 year old otherwise healthy man has persistent microscopic haematuria on a routine insurance medical.

- *Case II*

A 42 year old woman complains of painful passage of reddish urine for 5 days.

Please answer the following questions for each of the Cases listed above.

1) What are your **differential diagnoses**?
2) List the **clinical features** you would look for, to support each differential diagnosis.
3) What **investigations** would you do?
4) How would you **manage** this patient?