Symptom of Urinary System

Dr Loma Al-Mansouri

26th February 2019

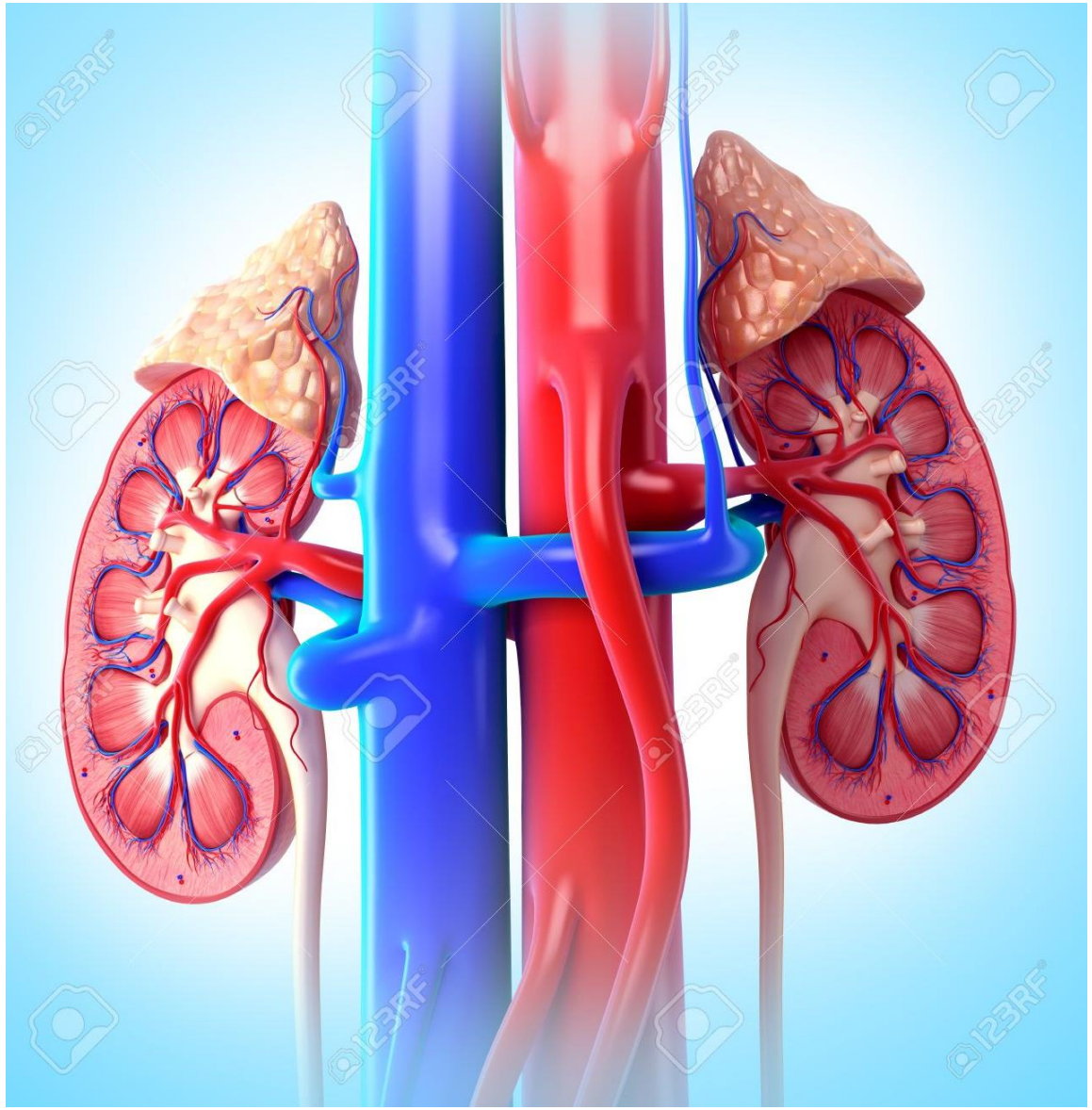
The kidneys

- The kidneys play a central role in excretion of many metabolic breakdown products, including ammonia and urea from protein, creatinine from muscle, uric acid from nucleic acids, drugs and toxins.
- They achieve this by making large volumes of an ultrafiltrate
- of plasma (120 mL/min, 170 L/24 hrs) at the glomerulus, and selectively reabsorbing components of this ultrafiltrate at points along the nephron.

- Each kidney is ~ **(11–14)** cm in length in healthy adults; they are located retroperitoneally on either side of the aorta and inferior vena cava between the 12th thoracic and 3rd lumbar vertebrae

- The normal urine output is =

  800 -2000 ml/ day (with a normal fluid intake of about 2 L daily).



Presenting problems in urinary system disease

➢Oliguria

Oliguria is defined as a urine output that is

<1 mL/kg/h - in infants
< 0.5 mL/kg/h - in children
< 400 mL or 500 mL - in adults

} per 24h

➢anuria

is defined as passing < 100 mL of urine per day

Common causes of oliguria:

1. Dehydration:
   - vomiting, diarrhoea or fever, and a simultaneous lack of adequate fluid intake
2. urinary tract obstruction, such as may result from an enlarged prostate
3. Severe infection leading to shock
4. Kidney inflammation or damage
5. Medications which may be harmful to the kidneys, including chemotherapy or immunosuppressant drugs and certain antibiotics

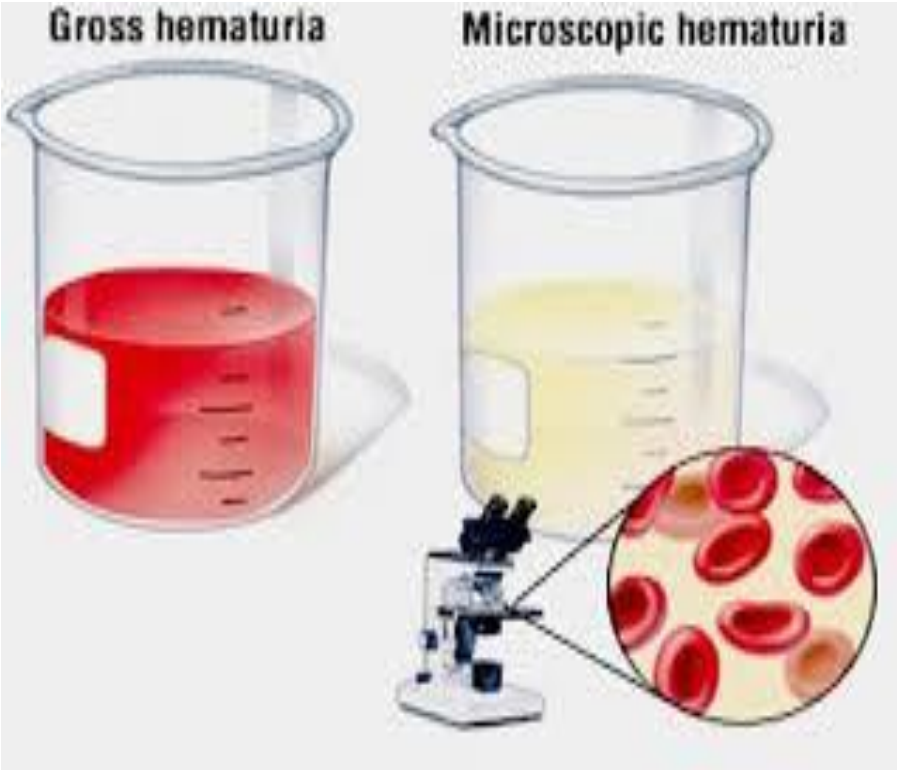
Causes of anuria (< 100 mL urine output per day)

Condition Examples	Condition Examples
Urinary obstruction (complete)	• Urinary retention due to prostatic enlargement, urethral stenosis, bladder tumour • Bilateral ureteric obstruction due to retroperitoneal fibrosis, cancer, radiation injury • Bilateral renal stones (usually staghorn calculi) • Massive crystalluria obstruction of tubules (rare)
Lack of renal perfusion (bilateral)	• Aortic dissection involving renal arteries • Severe acute tubular necrosis • Severe functional hypoperfusion (cardiorenal, hepatorenal)
Rapidly progressive glomerulonephritis	• Anti-glomerular basement membrane disease, vasculitis

Hematuria

- Macroscopic (gross, frank) Hematuria any discoloured urine visible to the naked eye

- Microscopic Haematuria defined as the presence >3 RBCs per high-power field in 3 consecutive centrifuged urine sample



- Healthy individuals may have occasional red blood cells in the urine (up to 12 500 cells/mL)

➢ Classification of haematuria

- ➢ According to the amount of RBC in the urine:
  - Gross (ie, overtly bloody, smoky, or tea-colored urine)
  - Microscopic > 3 RBC”s /HPF

- ➢ According to Timing (when it occurs during urination):
  - Early (initial) haematuria: Urethral origin, distal to external Sphincter
  - Terminal haematuria: Bladder neck or prostate origin
  - Diffuse (total) haematuria: Source is in the bladder or upper urinary tract

Differential Diagnosis of red urine

- Hematuria: RBCs
- Hemoglobinuria/myoglobinuria
- food in beets and blackberries
- Chronic lead and mercury poisoning
- Porphyrins
- Urates (pink)
- Drugs: Rifampicin (orange), Chloroquine, desferoxamine and laxative containing phenolphthalein

Interpretation of non-visible hematuria

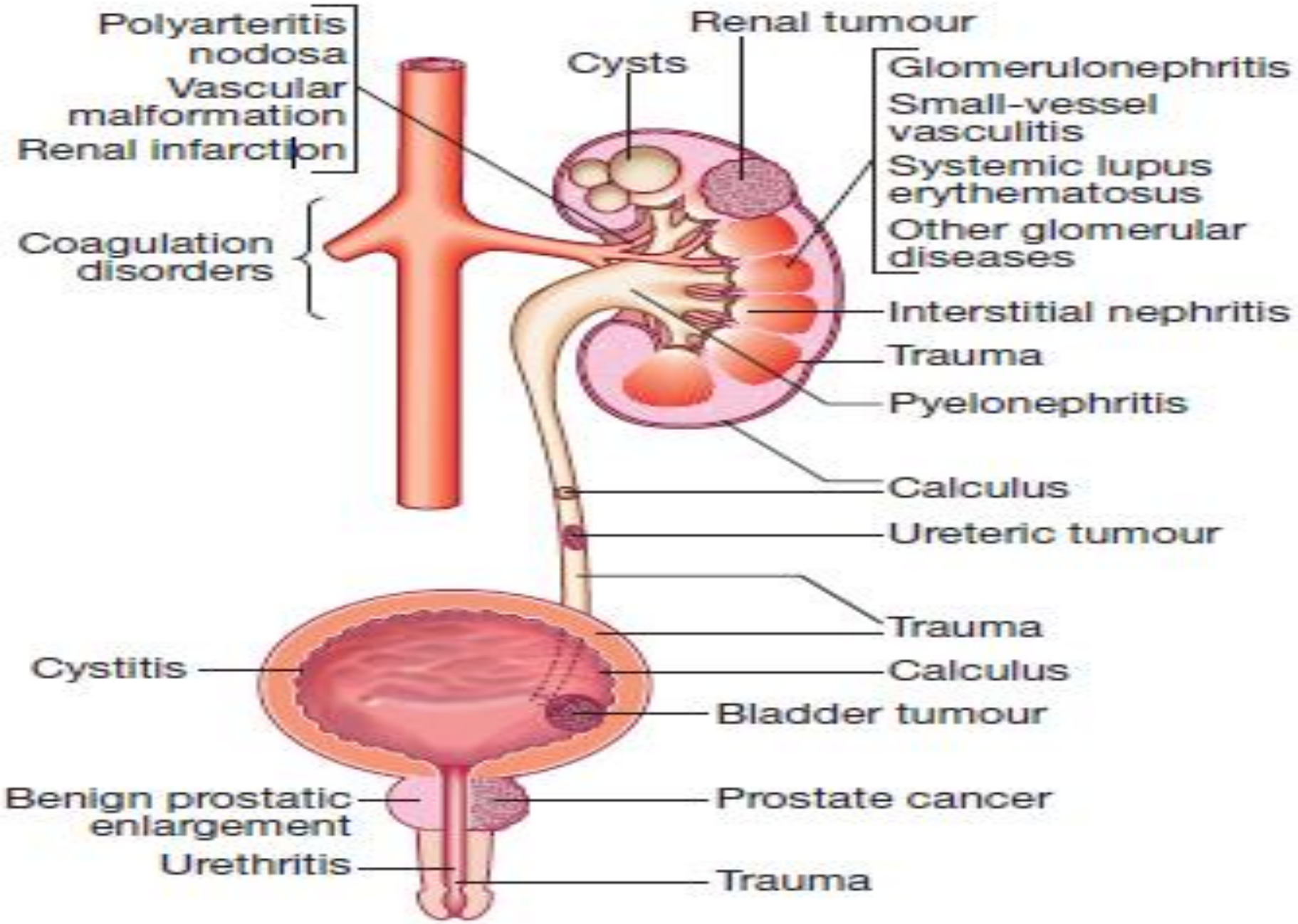
Dipstick test positive	Urine microscopy	Suggested cause
▪ Hematuria	Urine microscopy • White blood cells • Abnormal epithelial cells • Red cell casts • Dysmorphic erythrocytes • (phase contrast microscopy)	Suggested cause • Infection • Tumor • Glomerular bleeding*
▪ Hemoglobinuria	No red cells	Intravascular haemolysis
▪ Myoglobinuria (brown urine)	No red cells	Rhabdomyolysis

Causes of hematuria

- Hematuria can be caused by a variety of urothelial, vascular, glomerular, interstitial disorders

Glomerular Hematuria – brown, tea colored urine – proteinuria – deformed urinary RBCs – RBC casts

Causes of haematuria



Dysuria

- Is refers to painful urination, often described as burning, scalding or stinging, and commonly accompanied by suprapubic pain.
- It is often associated with frequency of micturition and a feeling of incomplete emptying of the bladder.

most common cause is urinary:

- tract infection
- sexually transmitted infections
- bladder stones

Frequency

- Frequency describes daytime micturition more often than a
- patient would expect.
- It may be a consequence of polyuria, when urine volume is normal or high
- also found in patients with dysuria and prostatic diseases, when the urine volume is normal.

Polyuria

is defined as passing a large urine volume in excess of 3 L/24 hrs.

- Investigation of polyuria includes measurement of urea, creatinine and electrolytes, glucose, calcium and albumin.
- A 24-hour urine collection may be helpful to confirm the severity of polyuria.

Causes of polyuria

- Excess fluid intake
- Osmotic diuresis: hyperglycaemia, hypercalcaemia
- Cranial diabetes insipidus
- Nephrogenic diabetes insipidus:
- Lithium
- Diuretics
- Interstitial nephritis
- Hypokalemia
- Hypercalcemia

Nocturia

- Nocturia is defined as waking up at night to void urine.
- It may be a consequence of
- polyuria
- fluid intake
- diuretic use in the late evening (including caffeine).
- Nocturia also occurs in CKD
- prostatic enlargement
- may also occur due to sleep disturbance without any functional abnormalities of the urinary tract

Urinary incontinence

- is involuntary leakage of urine
- It may occur in patients with a normal urinary tract, as the result of dementia or poor mobility, or transiently during an acute illness or hospitalisation, especially in older people

1. Stress incontinence

- This occurs because passive bladder pressure exceeds the urethral pressure, due either to poor pelvic floor support or a weak urethral sphincter or both.
- Stress incontinence is very common in women following childbirth.in men and usually follows surgery to the prostate.

2. Urge incontinence

- occurs when you have a sudden urge to urinate
- Resulting from detrusor over-activity leading to an increase in bladder pressure that overcomes the urethral sphincter.
- Urgency with or without incontinence may also be driven by a hypersensitive bladder resulting from UTI or a bladder stone

3. Continual incontinence

- This is suggestive of a fistula, usually between the bladder and vagina (vesicovaginal), or the ureter and vagina (ureterovaginal).

Causes

- gynaecological surgery
- gynaecological malignancy
- Radiotherapy
- in infants with congenital ectopic ureters.

4. Overflow incontinence

- This occurs when the bladder becomes chronically over-distended

- Causes
  - benign prostatic enlargement
  - bladder neck obstruction
  - atonic bladder due to pelvic nerves , either from surgery (commonly,
  - hysterectomy or rectal excision), trauma or infection

Thank you