

Obstructive Uropathy

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Lecturer

Anatomical Pathology Discipline

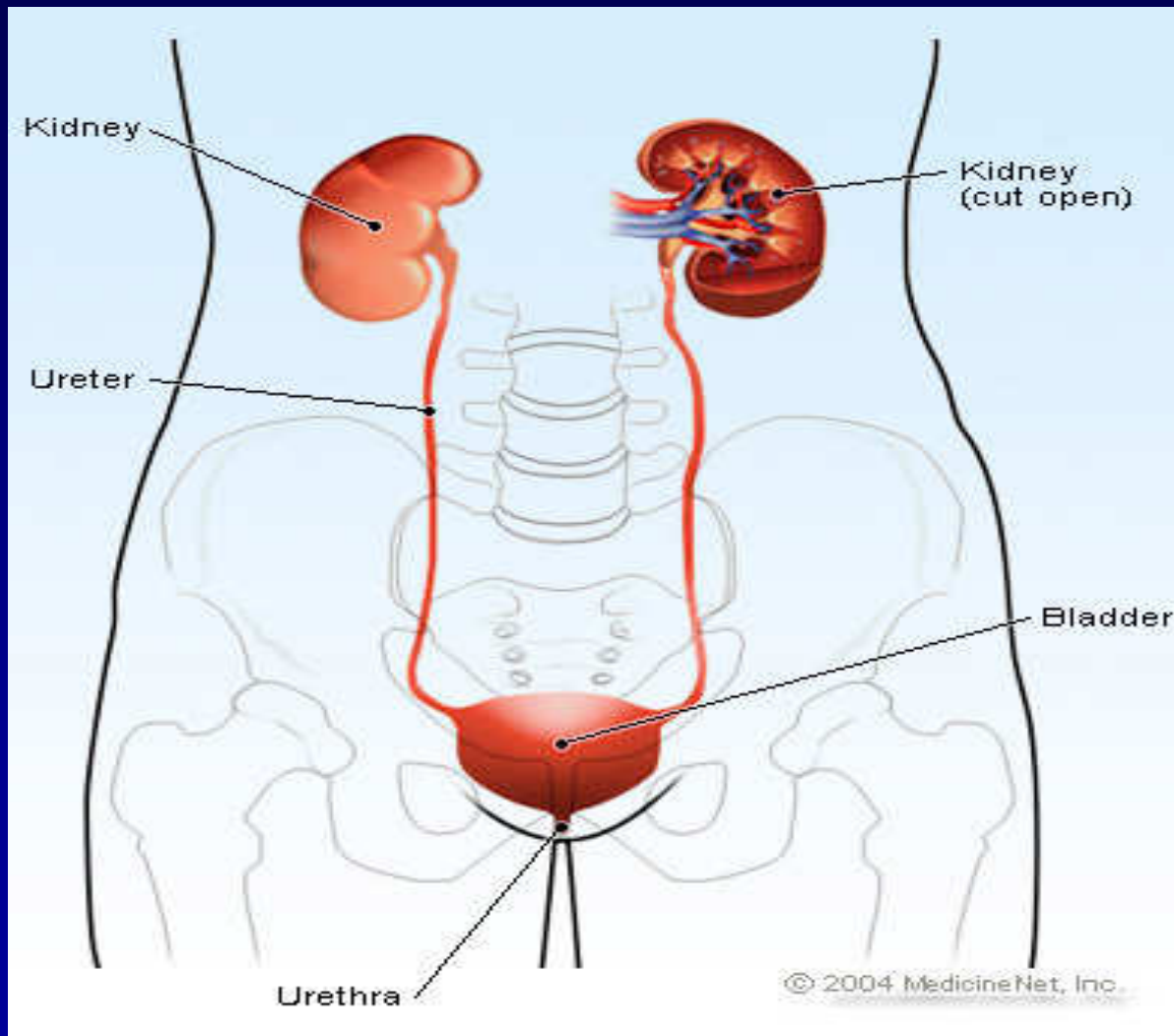


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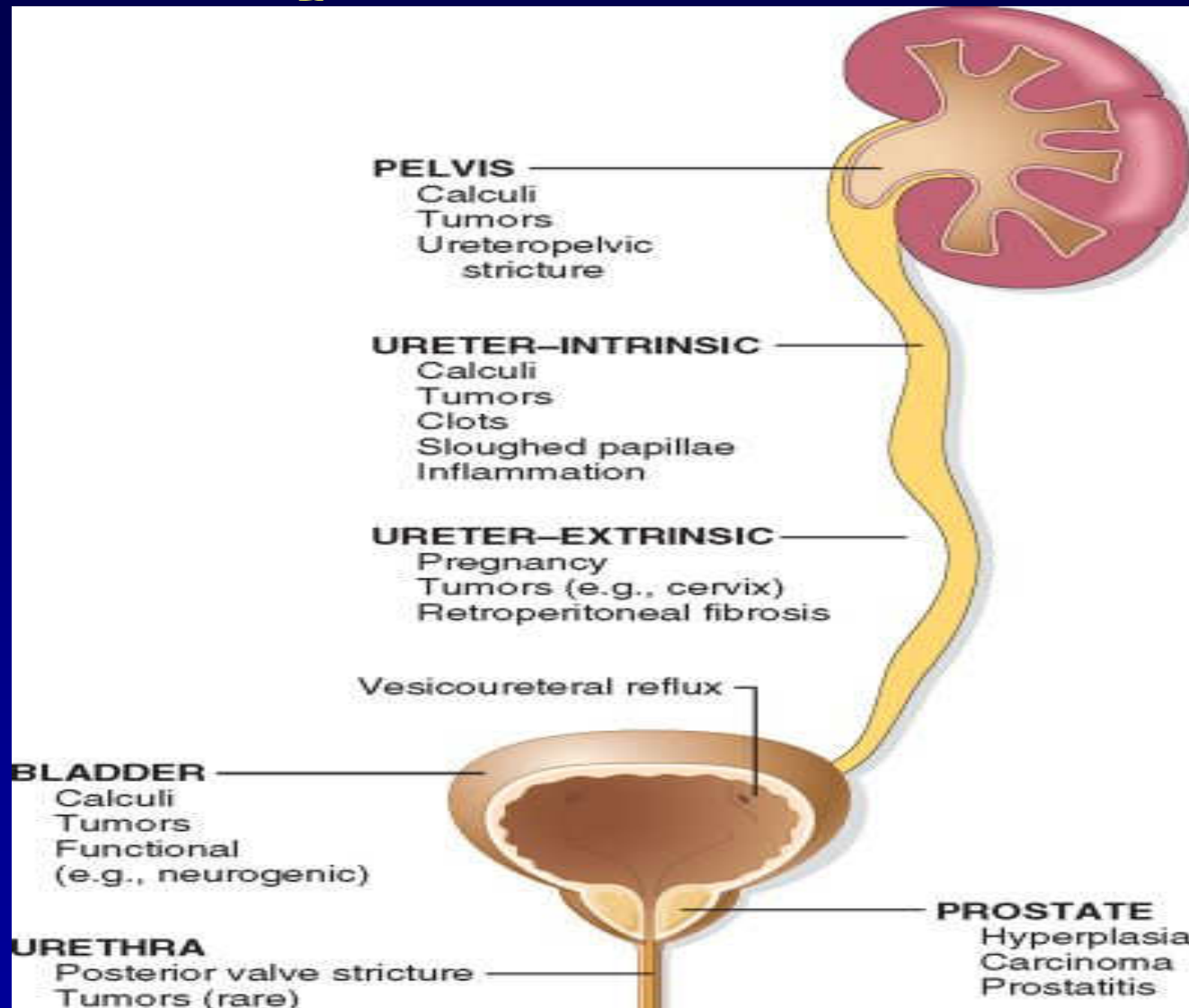
Some Definitions

- Hydronephrosis- Dilation of the renal pelvis or calyces
- Obstructive uropathy- functional or anatomic obstruction of urine flow at any level of the urinary tract
- Obstructive nephropathy- when obstruction causes functional or anatomic renal damage

Anatomy Review

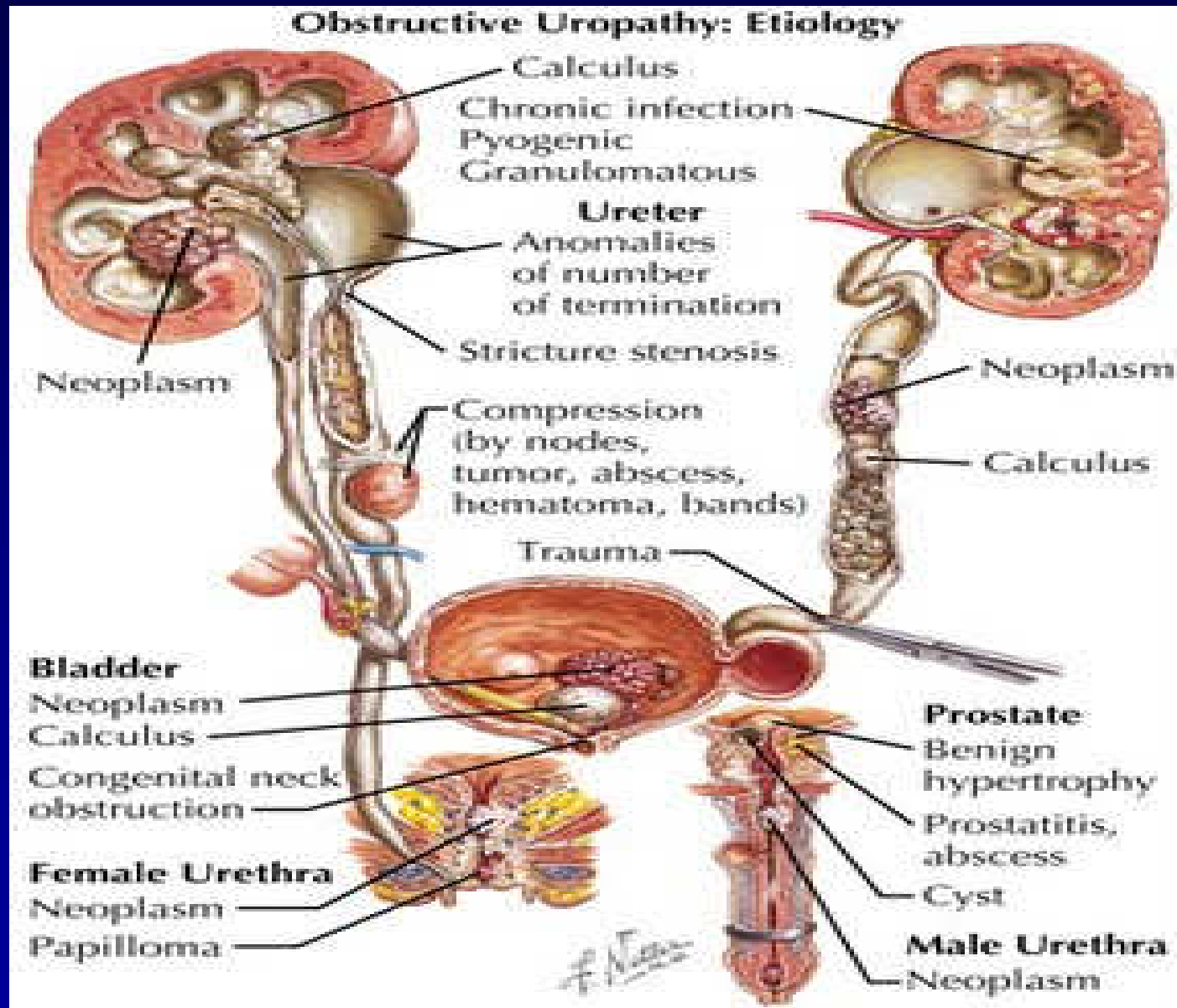


Types of Obstruction



Ref: Robins Pathological Basis of Diseases, 6th Ed.

Causes of Obstruction



Prevalence

- 3.1% in autopsy series
- No gender differences until 20 years
 - Females more common 20-60
 - Males more common older than 60
- 2-2.5% of children at autopsy
- PNG Population unknown

Pathophysiology

- Effects variable and depend on whether the obstruction is unilateral or bilateral.
- Mechanical obstruction of urine outflow results in:
 - Increase backflow pressure into kidneys
 - Stagnation of urine
 - Increased risk of infection
 - Increased risk of formation of stones
 - Induce non-infective inflammation in interstitial tissue of kidneys
- Progressive dilation of renal pelvis and calyces
- Progressive atrophy of renal parenchyma

Hydronephrosis



Ref: Robbins Pathological Basis of Diseases, 8th Ed.

Morphology

- Chronic cases – cortical atrophy and diffuse interstitial fibrosis.
- Advanced stages – kidneys become a thin wall cystic structure, significant parenchymal atrophy and obliteration of renal pyramids and thin cortex.

Clinical Presentation

- Acute obstruction – pain (renal colic) if calculi lodged in ureters. Prostatic enlargement cause urinary symptoms.
- Unilateral, complete or partial hydronephrosis - asymptomatic for long periods of time. Present late.
- Bilateral partial obstruction – polyuria and nocturia (unable to concentrate urine).
- Hypertension common in chronic cases
- Acute complete bilateral obstruction – oliguria, anuria and azotemia. Surgical Emergency.

Prognosis

- Depends on site, partial or complete, acute or chronic and duration of obstruction.
- Generally if diagnosed early and obstruction relieved, recovery is good with return to normal kidney function.
- Late diagnosis – chronic renal failure.

Urolithiasis (Renal Calculi, Stones)

- 4 types of stones
- Calcium oxalate (phosphate) – 75%
- Struvite (Magnesium Ammonium Phosphate) – 10-15%
- Uric Acid – 6%
- Cystine – 1-2%
- Unknown - ?10%

Pathogenesis

- Calcium oxalate stones – hypercalcemia and hypercalciuria from various causes
- Magnesium ammonium phosphate stones – infections from urea splitting bacteria (e.g. Proteus and some staphylococci).
- Uric acid stones – hyperuricemia (e.g. gout, leukemias). However, >50% of patients with urate stones do not have hyperuricemia nor increased urine uric acid excretion
- Cystine stones – caused by genetic defects in renal reabsorption of amino acids & cystine.

Urolithiasis Pathogenesis

- Cystine stones form at low urinary Ph.
- Risk factors for kidney stone formation:
 - increased concentration of stone constituents (saturated and thus precipitate)
 - Changes in urinary Ph (low Ph, higher risk).
 - Decreased urine volume
 - Urinary tract infection
- However, many calculi occur in the absence of these factors. ? Deficiency of inhibitors of crystal formation. Long list. Read up.

Site of Kidney Stone Formation

- Unilateral in 80%
- Renal calyces and pelves common sites
- small (2-3 mm)
- smooth or irregular spiked edges
- Bladder
- Staghorn calculi - large stone at pelvis forming a cast of the pelvic and calyceal system.

Clinical Presentation of Kidney Stones

- Symptoms appear if causing obstruction, or produce ulceration and cause bleeding.
- Can be asymptomatic
- Smaller stones pass into ureters producing intense pain (renal colic).
- Hematuria
- Recurrent UTI

Laboratory Diagnosis

- UEC
- BUN
- Urinalysis
- Other modes of investigation – USS, X-ray, CT

Prognosis – Kidney Stone

- Generally good.
- Depends on underlying cause of kidney stone formation

End

Main Reference: Robins Pathological
Basis of Diseases, 6th Ed. Chapter on
The Pancreas.

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www.pathologyatsmhs.wordpress.com