



GENITOURINARY SYSTEM

SUBJECT : Pathology

LEC NO. : Summary 4

DONE BY : Batool Alzubaidi

وَقُلْ رَبِّ زِدْنِي عِلْمًا

* Chronic Glomerulonephritis *

- final outcome of various forms of G disease, the most common cause of chronic renal failure, 20% of chronic GN arise with no history of symptomatic renal disease
- **Grossly** » both kidneys are symmetrically contracted & diffusely granular
- **Histopathology** » scarring & obliteration of G, atrophy of tubules, interstitial fibrosis, arteries are thick walled & narrowed due to hypertension secondary to chronic GN, damaged kidneys are designated "end-stage kidneys"
- **Causes** » repeated episodes acute glomerular nephritis, hypertensive nephrosclerosis, hyperlipidemia
- **Symptoms** » asymptomatic for years, as glomerular damage increases before signs and symptoms develop of renal failure
- **Diagnosis** » urinalysis, proteinuria, urinary casts, BUN elevation, GFR falls, chronic GN. Masson trichrome stain, blue-staining collagen

* Diseases Affecting Tubules(T) & Interstitium *

- Characterized by » inflammatory involvement of the T & interstitium or ischemic/ toxic T injury

1. Tubulointerstitial Nephritis

- **Causes** » bacterial infections, drugs, metabolic disorders, physical injury, immune reaction
- group of primary inflammatory diseases, G may be spared or affected only late, pyelonephritis is caused by bacterial infection, interstitial nephritis is nonbacterial in origin
- **Categories** » acute, chronic (on basis of clinical features & character of the inflammatory exudate)
- **Urinary tract infection** » 1. lower UTI (cystitis, prostatitis, urethritis) 2. upper UTI (pyelonephritis)

A. Infectious : Acute Pyelonephritis

- common suppurative inflammation of the kidney & renal pelvis caused by bacterial infection, majority of cases of upper UTI are associated with lower UTI
- **2 routes** » hematogenous, commonest & most important ascending route
- **UTI most commonly affects females** » urethra is close to rectum, short urethra, trauma to the urethra during sexual intercourse facilitate the bacterial entry
- **Pathogenesis** » most common E.coli gram-negative rod, pseudomonas with recurrent infections in persons who undergo UT manipulations (catheterization & cystoscopy), bladder outflow obstruction

or bladder dysfunction predispose to UTI results in incomplete emptying, presence of stasis bacteria introduced into bladder can multiply undisturbed without being flushed out or destroyed by bladder wall, UTI common among individuals with UT obstruction as with benign prostatic hyperplasia & uterine prolapse & stones, UTI is also in DM

- **Vesicoureteral reflux** » incompetent vesicoureteral orifice allows reflux of bladder urine into the ureters, present in 20-40% of young children with UTI, which is a congenital defect, acquired in individuals with flaccid bladder resulting from spinal cord injury & with neurogenic bladder dysfunction secondary to DM
- **Grossly** » one or both kidneys may be involved, affected kidney may be normal in size or enlarged, microabscesses in both cortex and medulla.
- **Characteristically** » multiple raised discrete yellowish focal pale abscesses on renal surface
- **Microscopically** » early is limited to the interstitial tissue, later the abscesses rupture into tubules, & the masses of intratubular neutrophils extend into collecting ducts, WBC (granular) casts, polymorphs, lymphocytes & plasma cells, some tubules show severe cloudy swelling, tubules lost most of its epithelial lining
- **Clinically** » sudden, pain at the costovertebral angle, chills, fever, malaise, dysuria, frequency, urgency, diagnosed by pyuria and bacteriuria, usually unilateral, recurrent or chronic when it is bilateral, very poor prognosis

Papillary Necrosis (second form of pyelonephritis)

- common among diabetics, complicate acute pyelonephritis when UT obstruction, seen with chronic interstitial nephritis associated with analgesic abuse, combination of ischemic + suppurative necrosis of tips of renal pyramids (renal papillae)
- **Grossly** » sharply defined gray-white to yellow necrosis of apical 2/3 of 1, 2 or all the pyramids papillae, **Microscopically** » coagulative necrosis
- **Symptoms** » back pain, cloudy urine, tissue pieces, fever, frequent painful urination, urinary incontinence
- **Pathophysiology** » papillae are vulnerable to ischemia as they are supplied by small caliber arteries which are liable to obstruction, necrosis of the papillae results in sloughing into the lumen, causing hematuria.

Malakoplakia (uncommon chronic granulomatous inflammatory condition)
gram-negative bacteria, papule / plaque / ulceration, insufficient killing of bacteria by macrophages, partially digested E bacteria accumulate in macrophages and leads to deposition of iron and calcium, foamy macrophages with PAS+ granular cytoplasm, Michaelis-Gutmann bodies (laminated mineralized concretions) calcium and iron

B. Drug-Induced Interstitial Nephritis

2 forms: acute and chronic (analgesic), most common: synthetic penicillins

Pathogenesis » drugs act as haptens, covalently bind to some cytoplasmic or extracellular component of tubular cells & become immunogenic, IgE-(Type I) or cell-mediated immune (Type IV) hypersensitivity reactions

Morphology » edema, infiltration by large numbers of lymphocytes macrophages eosinophils neutrophils, glomeruli are normal except in cases caused by NSAID, drugs (methicillin, thiazides, rifampin) interstitial non-necrotizing granulomas with giant cells is seen

Clinically » 2 to 40 days (average 15 days) after exposure to the drug, fever, rash, eosinophilia, hematuria, mild proteinuria, leukocyturia, rising serum creatinine or acute RF with oliguria in 50% of cases, withdrawal of offending drug is followed by recovery