

Lec 5

Tubulointerstitial Diseases

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Definition

- Tubulointerstitial diseases (TIDs) are renal disorders primarily affecting the tubules and interstitium rather than glomeruli or vessels.
- They can be acute or chronic.

Anatomy

- Renal tubules: PCT, Loop of Henle, DCT, Collecting duct.
- Interstitial tissue: fibroblasts, immune cells, and capillaries.

Classification

- 1. Acute Tubulointerstitial Nephritis (ATIN)
- 2. Chronic Tubulointerstitial Nephritis (CTIN)
- 3. Special forms:
 - - Drug-induced
 - - Infection-related
 - - Metabolic
 - - Toxin or radiation-induced

Acute Tubulointerstitial Nephritis (ATIN) - Causes

- Drugs: antibiotics, NSAIDs, diuretics, PPIs (proton pump inhibitors)
- Infections: bacterial (pyelonephritis), viral (Cytomegalo virus CMV, Ebstein bar virus EBV)
- Autoimmune: SLE, Sjögren's syndrome

ATIN - Pathogenesis & Morphology

- Hypersensitivity → interstitial inflammation → tubular injury.
- Microscopy: edema, lymphocytes, plasma cells, eosinophils, tubulitis.
- **Glomeruli usually spared.**

ATIN - Clinical & Prognosis

- Clinical: fever, rash, eosinophilia, hematuria, mild proteinuria.
- Appears 2–3 weeks after exposure.
- Usually **reversible** after drug withdrawal.

Chronic Tubulointerstitial Nephritis (CTIN)

- Causes: analgesics, lithium, heavy metals, chronic pyelonephritis, metabolic disorders.
- Pathology: tubular atrophy, interstitial fibrosis.
- Leads to **chronic renal failure**.

CTIN - Morphology & Clinical

- Gross: small, granular kidneys.
- Microscopy: fibrosis, atrophy, lymphocytes, secondary glomerulosclerosis.
- Clinical: polyuria, nocturia, mild proteinuria, hypertension.

Drug-Induced Tubulointerstitial Disease

- NSAIDs: ATIN + minimal change disease.
- Lithium: chronic nephritis + nephrogenic Diabetes insipidus.
- Cyclosporine: dose-related fibrosis.

Complications

- Chronic kidney disease (CKD)
- Tubular acidosis
- Electrolyte imbalance
- Secondary glomerulosclerosis

- TIDs mainly damage tubules and interstitium.
- Early recognition of drug-induced forms is crucial.
- Chronic injury leads to **fibrosis and irreversible damage.**

Thank you