DISEASES AFFECTING TUBULES AND INTERSTITIUM

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myloma · involving
tubules & interstitium

Tubulointerstitial Nephritis

very broad term

- **Causes :**
- **1- bacterial infection.**
- **2- drugs.**
- **3- metabolic disorders**
- **4- physical injury (irradiation).**
- **5- immune reactions.**

- **divided into :**
- **1-acute**
- **2-chronic**

Urinary tract infections

1- lower UTI (cystitis, prostatitis, urethritis).

2- upper UTI (pyelonephritis).

Infectious : Acute Pyelonephritis

- **inflammation of kidney and renal pelvis, usually due to bacterial infection.**
- **Most commonly:**

1- Escherichia coli

Others:

2- *Proteus.*

3- Klebsiella.

4- Enterobacter.

5- *Pseudomonas.*

6- Staphylococci and *Streptococcus faecalis* (uncommon).

Drug-Induced Interstitial Nephritis

- **Two forms:** according to the duration of the problem
- **1-Acute Drug-Induced Interstitial Nephritis** <7 wks
- **2- chronic (Analgesic) Nephropathy** >7 wks → most common is analgesic drugs
- **Acute TIN**
- **Most common: synthetic penicillins (methicillin, ampicillin)**
- **Others: synthetic antibiotics; diuretics; NSAIDs; other drugs**

- **Pathogenesis**
- immune mechanism.
- ? type I hypersensitivity.
- ? T cell-mediated (type IV) hypersensitivity reaction.

- **Morphology**
- interstitium : lymphocytes and macrophages, eosinophils and neutrophils

- glomeruli are normal

Clinical course

- **2-40 days after exposure to drug.**
- ***fever*, *eosinophilia* & *rash* (25%)** because of systemic manifestations of hypersensitivity rxns
- ***renal abnormalities:* hematuria, minimal or no proteinuria, and leukocyturia** → since Glomeruli are normal
- **withdrawal of the offending drug is followed by recovery**

Analgesic = Chronic

Analgesic Nephropathy: chronic drug-induced

- Consumption of large quantities of analgesics over long periods may cause **chronic interstitial nephritis** *often with* ***renal papillary necrosis***.
- **Aspirin and acetaminophen are common**
- **Pathogenesis** not entirely clear.
  - ***covalent binding*** **and** ***oxidative damage***
  - **inhibition of prostaglandin synthesis**

→ inducing vasoconstriction
∴ ischemia & atrophy of the kidney

on tubules

2 for a long time

ex. patients of Rheumatoid Arthritis

NSAIDs in General can cause Chronic drug induced nephropathy

Clinical Course

- **Progressive renal impairment, chronic renal failure, hypertension….**

- **A complication of analgesic abuse is: increased incidence of *transitional-cell carcinoma* of the renal pelvis**

due to chronic inflam. & necrosis

Acute Tubular Necrosis (ATN)

- characterized morphologically by damaged tubular epithelial cells and clinically by acute suppression of renal function.
- *It is the most common cause of acute renal failure.*
- ATN is a reversible condition if treated properly and quickly.

- Clinical manifestations: electrolyte abnormalities, acidosis, uremia, signs of fluid overload, often oliguria.
- Proximal tubular epithelial cells are particularly sensitive to hypoxemia and toxins

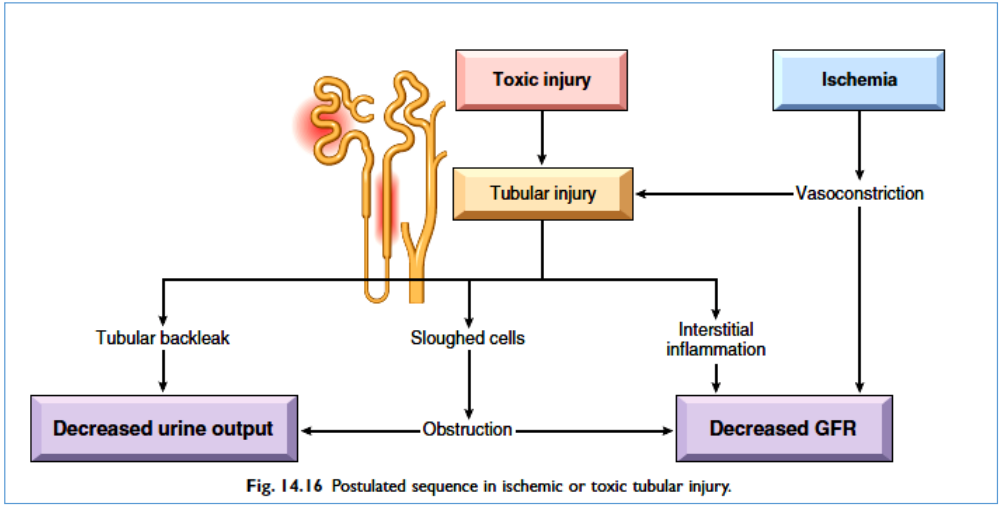


Fig. 14.16 Postulated sequence in ischemic or toxic tubular injury.

- ***Types:***

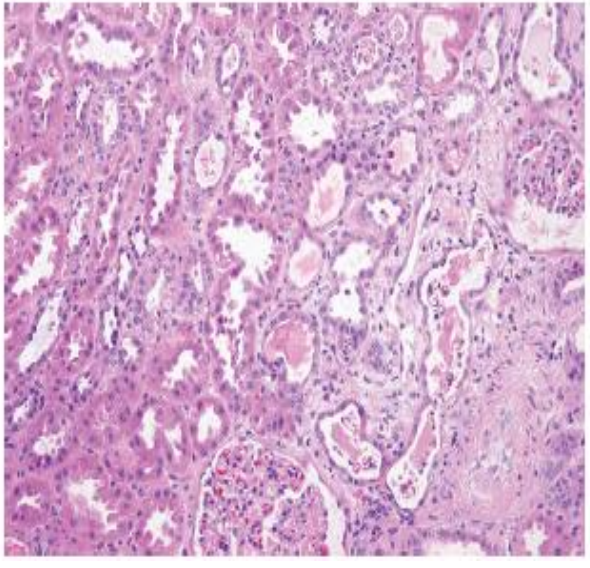
1- ischemic ATN :

usually generalised ischemia

- ***most common***
- ***associated with shock***
- ***(e.g.*** **severe trauma; acute pancreatitis; septicemia; mismatched blood transfusions,hemolytic crises, myoglobinuria, etc…)**

- ***2. nephrotoxic ATN***
- **poisons including heavy metals (e.g., mercury)**
- **organic solvents (e.g., carbon tetrachloride)** CCl4
- **drugs such as gentamicin and other antibiotics, and radiographic contrast agents.**

Acute tubular epithelial cell injury with blebbing at the luminal pole, detachment of tubular cells from their underlying basement membranes,
and granular casts



ATI- management

- **repair and tubular regeneration → gradual clinical improvement**
- **With supportive care, patients who survive have a good chance of recovering renal function**
- **those with preexisting chronic kidney disease, complete recovery is less frequent**