Glomerular Disease

Lec 4

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Glomerular Diseases

- Glomerular diseases are disorders that primarily affect the glomeruli, the filtering units of the kidney.
- They can lead to proteinuria, hematuria, decreased GFR, and may progress to chronic renal failure.

Causes of Glomerular Diseases

- Primary (Intrinsic) causes:
- • Minimal change disease
- • FSGS
- • Membranous nephropathy
- • IgA nephropathy
- • Post-streptococcal GN

- Secondary causes:
- • Diabetes mellitus
- • SLE
- • Amyloidosis
- • Hypertension
- • Vasculitis

Classification by Clinical Presentation

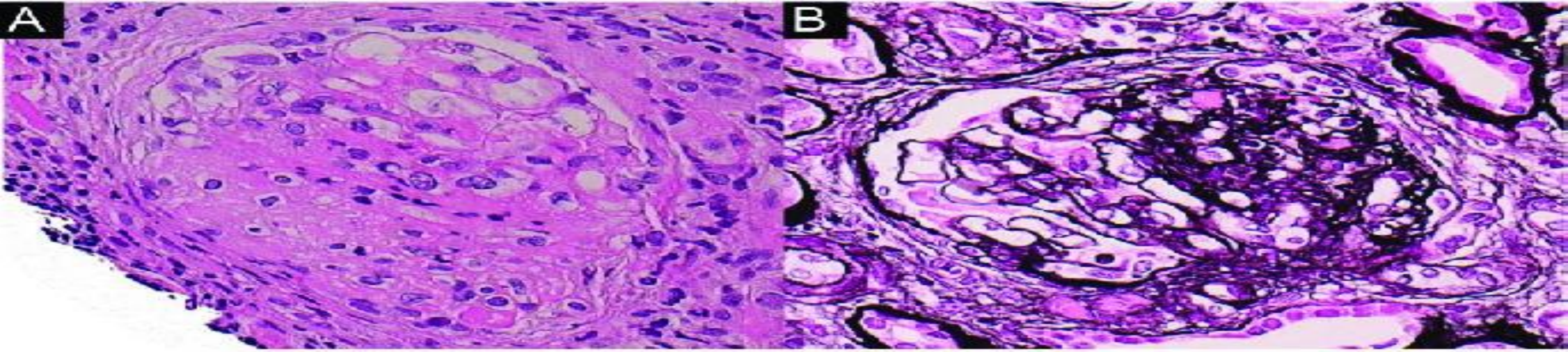
- • **Nephritic syndrome**: Hematuria, hypertension, mild proteinuria, ↓GFR
- • **Nephrotic syndrome**: Heavy proteinuria, hypoalbuminemia, edema, hyperlipidemia
- • **Asymptomatic hematuria/proteinuria**
- • **RPGN:** Rapid loss of renal function, crescents
- • **Chronic GN**: End-stage fibrosis

Minimal Change Disease (MCD)

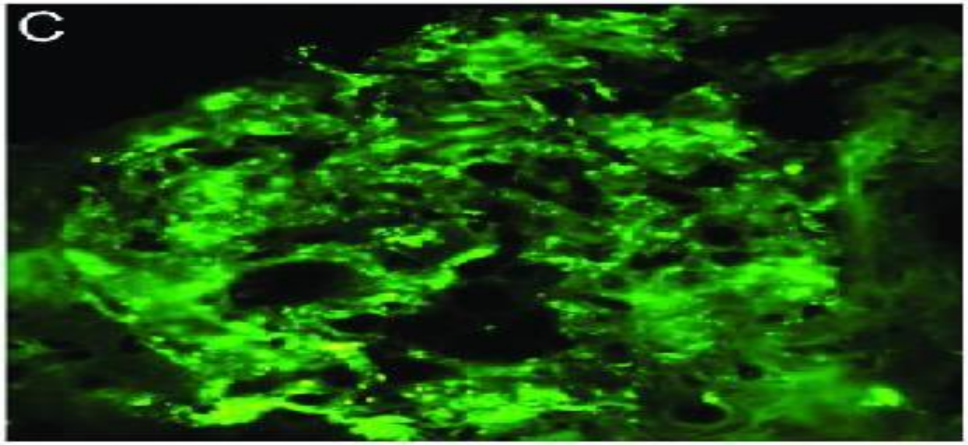
- LM: Normal glomeruli
- EM: Effacement of podocyte foot processes
- No immune deposits
- Common in children, responds to steroids
- **Note(LM:light microscope,EM:Electrone microscope,IF:immunoflorescence)**

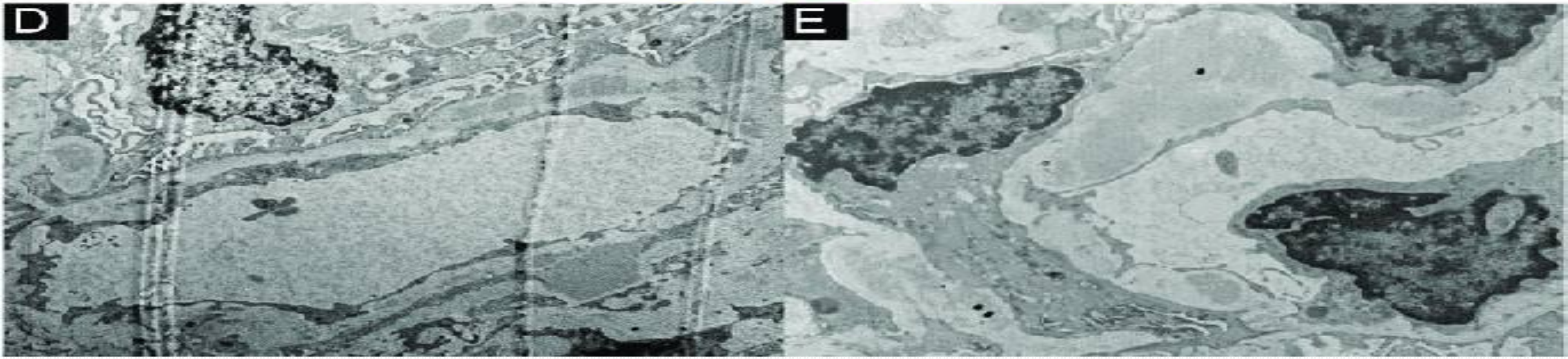
Focal Segmental Glomerulosclerosis (FSGS)

- LM: Segmental sclerosis in some glomeruli
- IF: IgM and C3 trapped in sclerotic areas
- EM: Loss of foot processes
- May lead to chronic renal failure



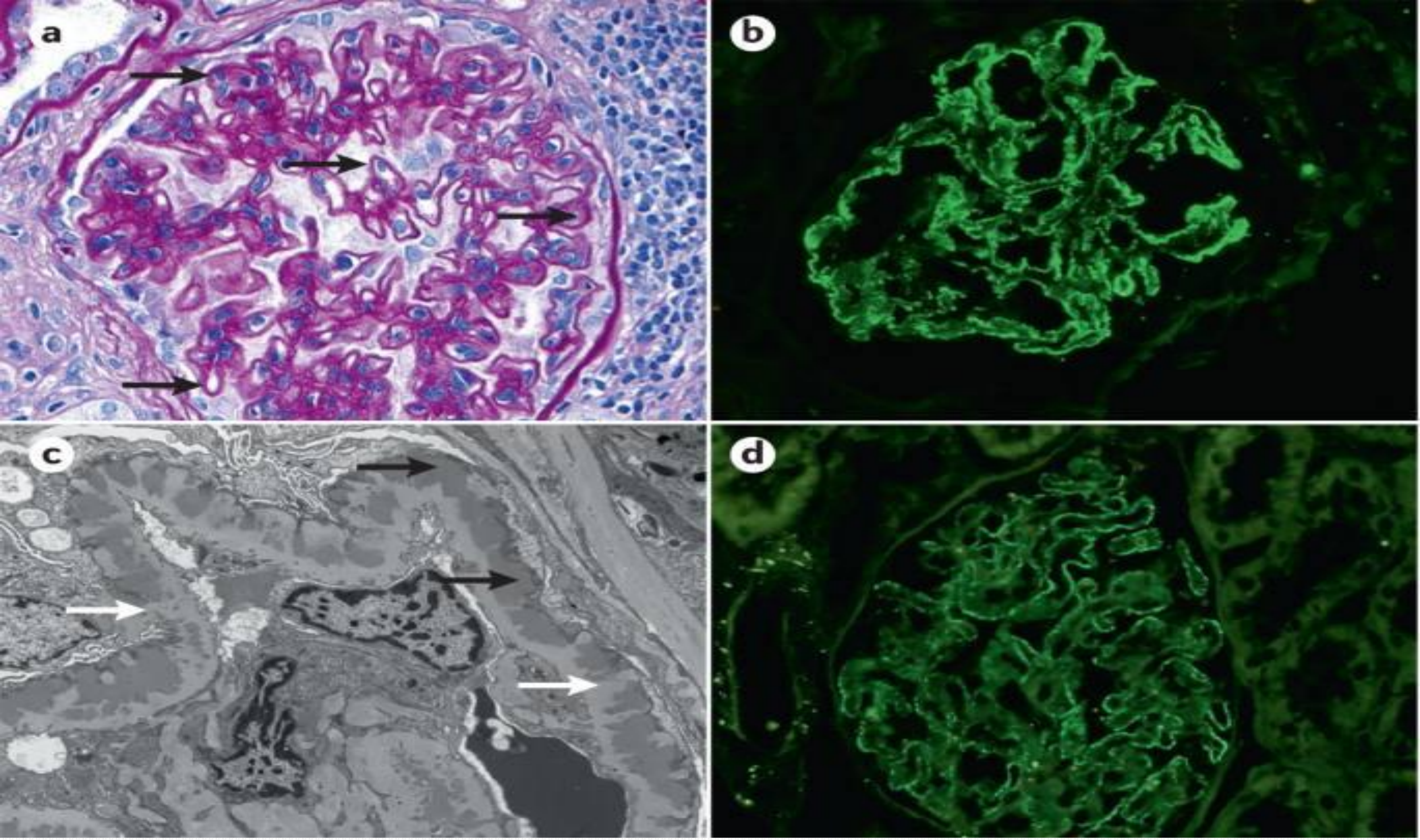
FSGS





Membranous Nephropathy

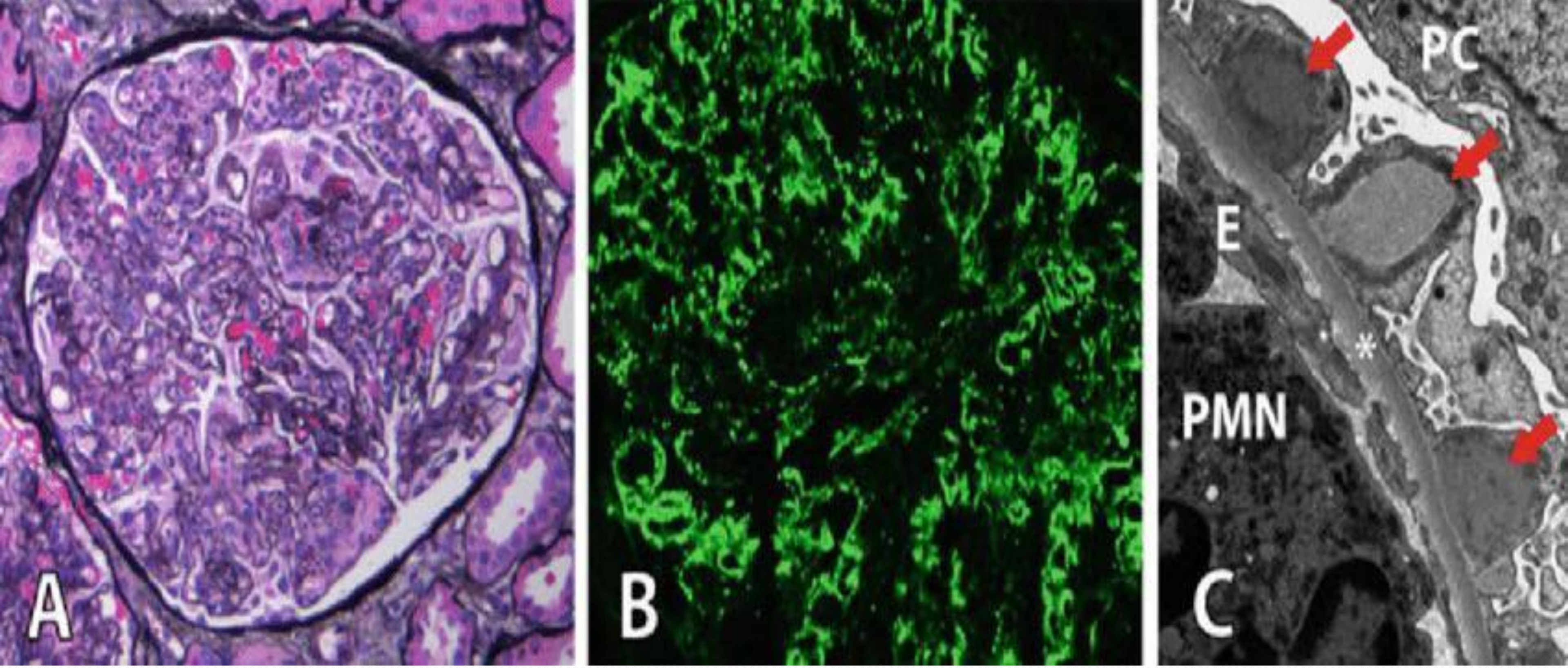
- LM: Diffuse thickening of capillary wall
- IF: Granular IgG and C3 along GBM
- EM: Subepithelial deposits ('spike and dome')
- Autoimmune (anti-PLA2R antibodies)
- PLA2R : Phospholipase A2 Receptor
- PLA2R is a receptor located on the surface of podocytes in the glomeruli.



- Membranous Nephropathy

Post-Streptococcal GN

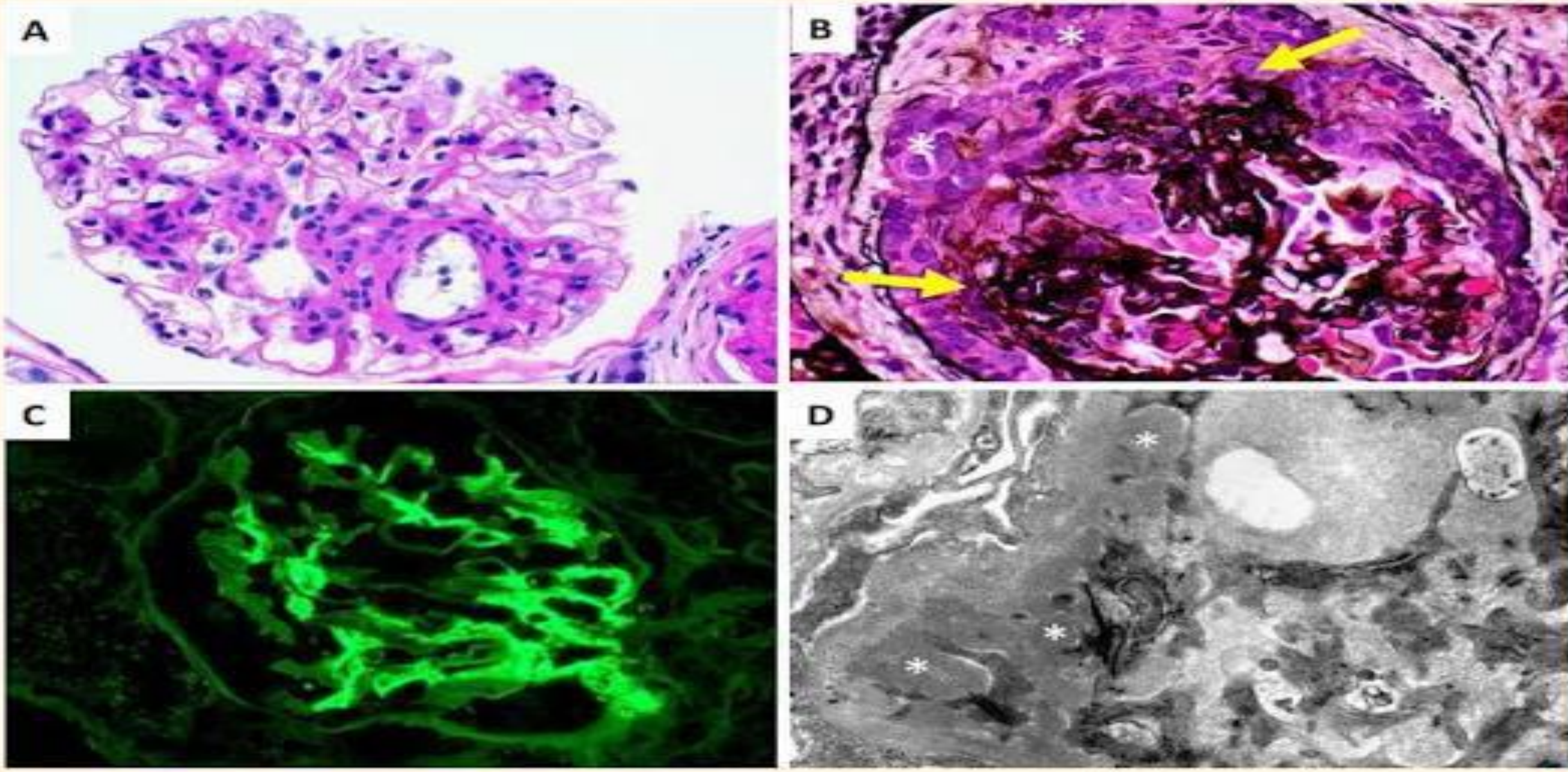
- LM: Hypercellular glomeruli (neutrophils, proliferation)
- IF: Granular IgG, IgM, C3 ('starry sky')
- EM: Subepithelial 'humps'
- Follows streptococcal infection



- Post-Streptococcal GN

IgA Nephropathy (Berger's Disease)

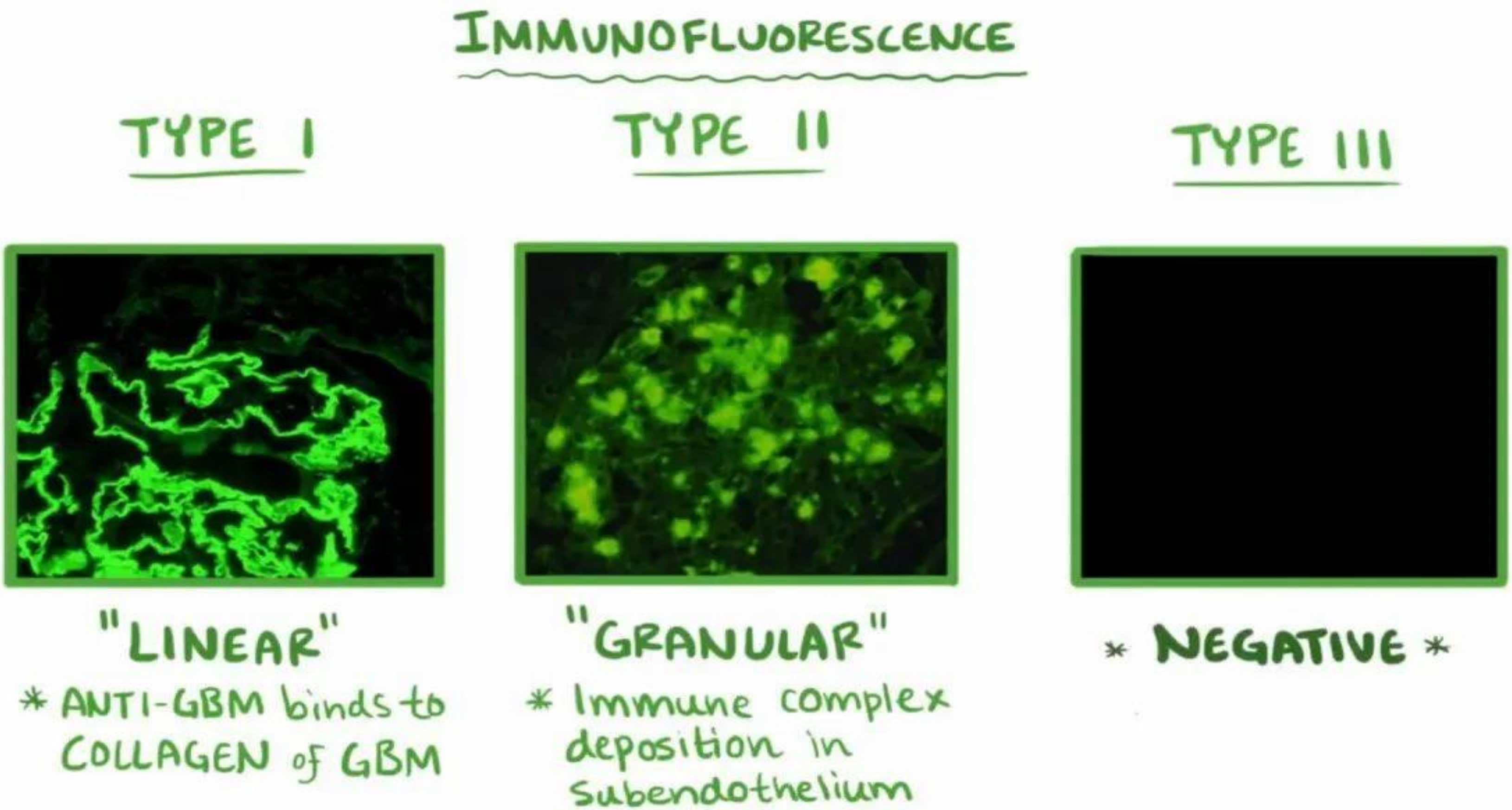
- LM: Mesangial proliferation
- IF: Mesangial IgA deposition
- EM: Electron-dense mesangial deposits
- Presents after upper respiratory infection



- IgA Nephropathy (Berger’s Disease)

Crescentic GN (RPGN)

- LM: Crescents in Bowman’s space
- IF/EM varies:
- • Linear (Anti-GBM)
- • Granular (Immune complex)
- • Negative (Pauci-immune)



- Crescentic GN (RPGN)

Pathogenesis Overview

- • Immune complex deposition → SLE, post-strep GN
- • Anti-GBM antibodies → Goodpasture
- • Cell-mediated injury → FSGS
- • Metabolic/hemodynamic → Diabetes, hypertension

Outcome

- • Acute: May resolve completely (post-strep GN)
- • Chronic: Glomerulosclerosis, renal failure
- • Early recognition and treatment slow progression


thank you