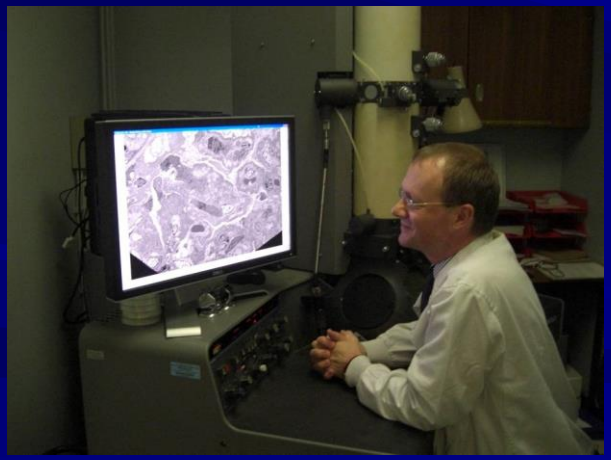
Basic Renal EM workshop

Southampton

September 30th 2011

Renal Ultrastructural Pathology
Lecture 2 Me - Mi



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Renal ultrastructural pathology
Lecture 2 - Topics

1. Mesangio Capillary Glomerulo Nephritis MCGN type I
2. Mesangio Capillary Glomerulo Nephritis MCGN type II (linear dense deposit disease)
3. Membranous Glomerulo Nephritis
4. Minimal Change nephropathy

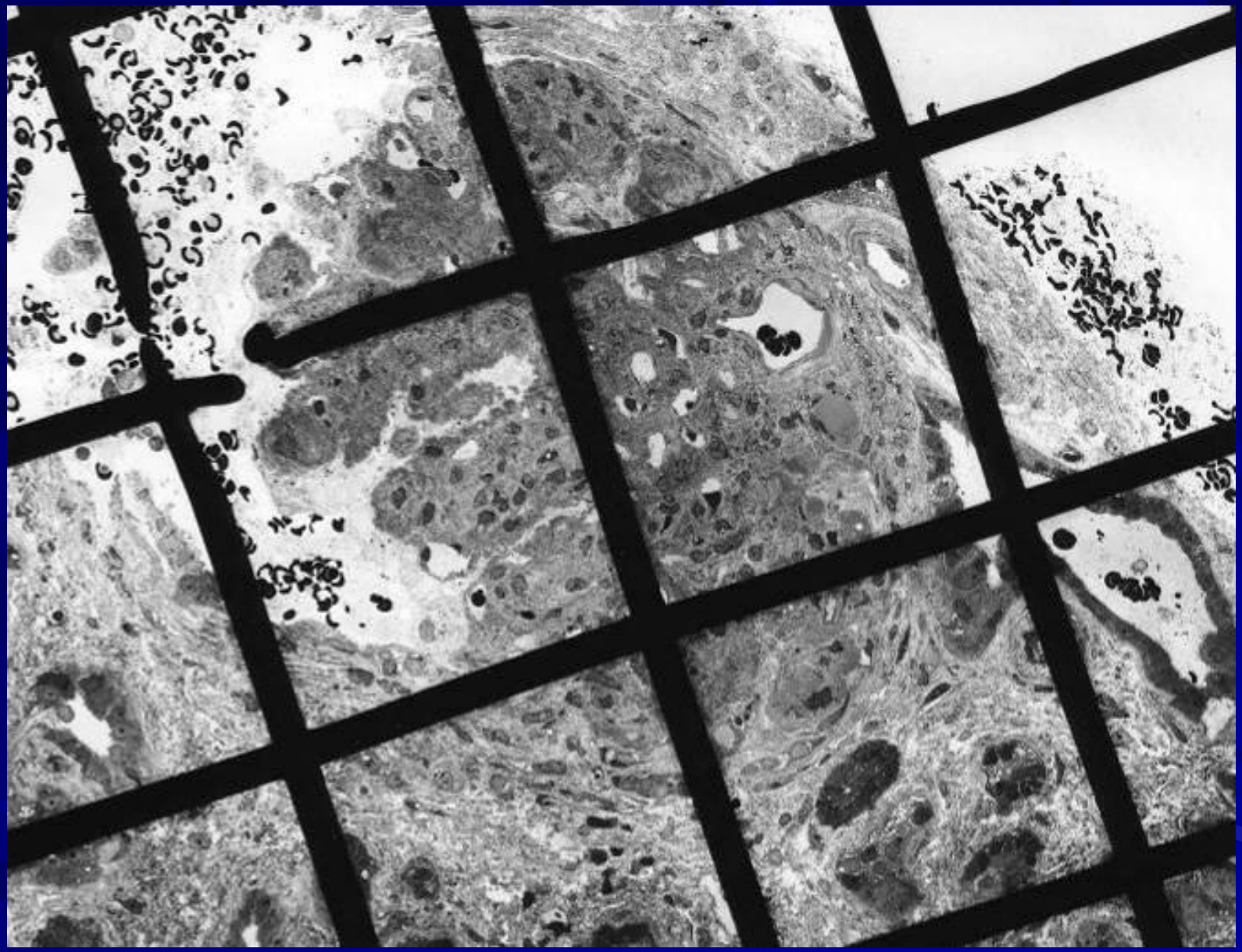
Mesangiocapillaryglomerulonephritis
MCGN type 1

or

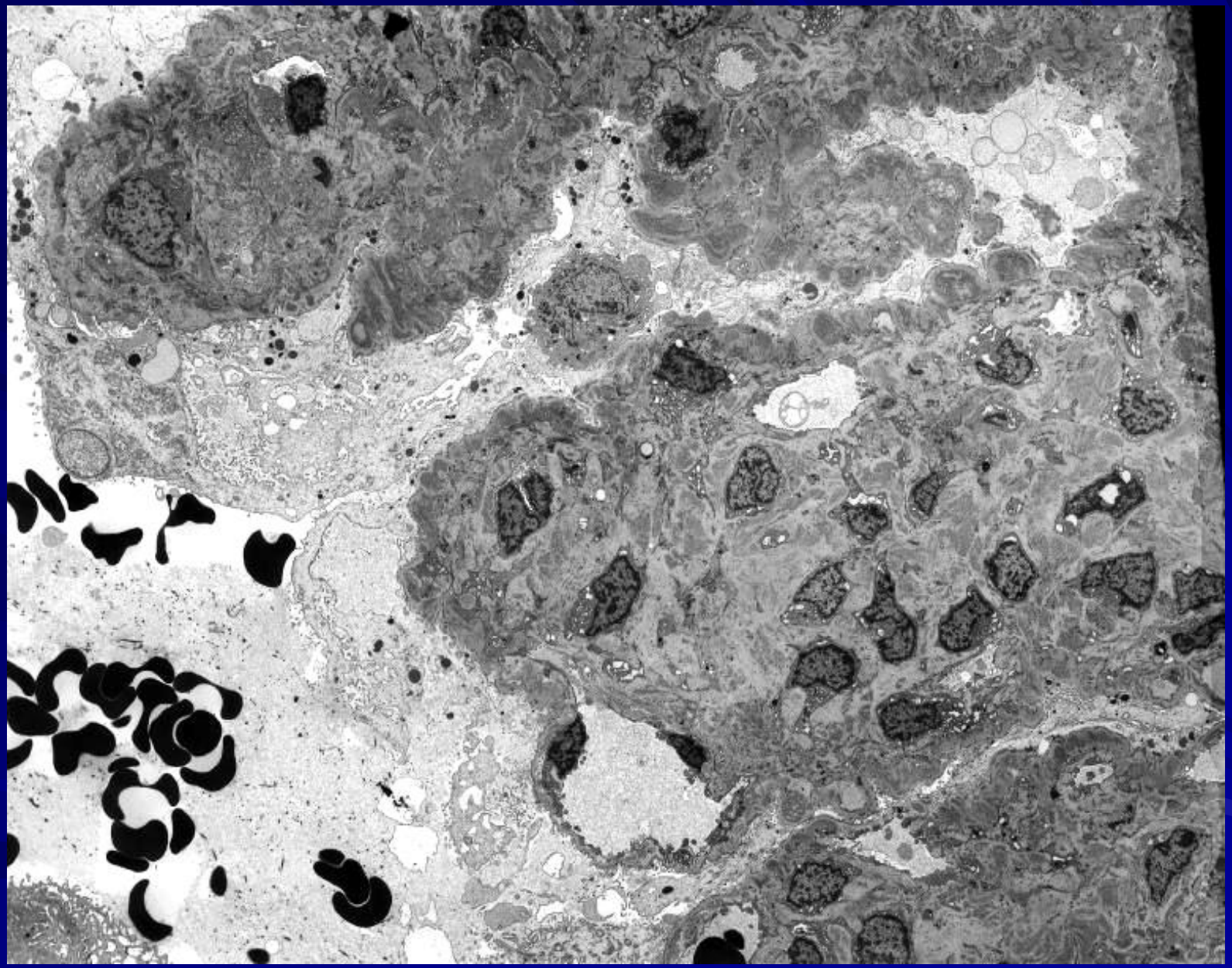
Membranoproliferativeglomerulonephritis
MPGN type 1

Membranoproliferativeglomerulonephritis MPGN type 1 & 2

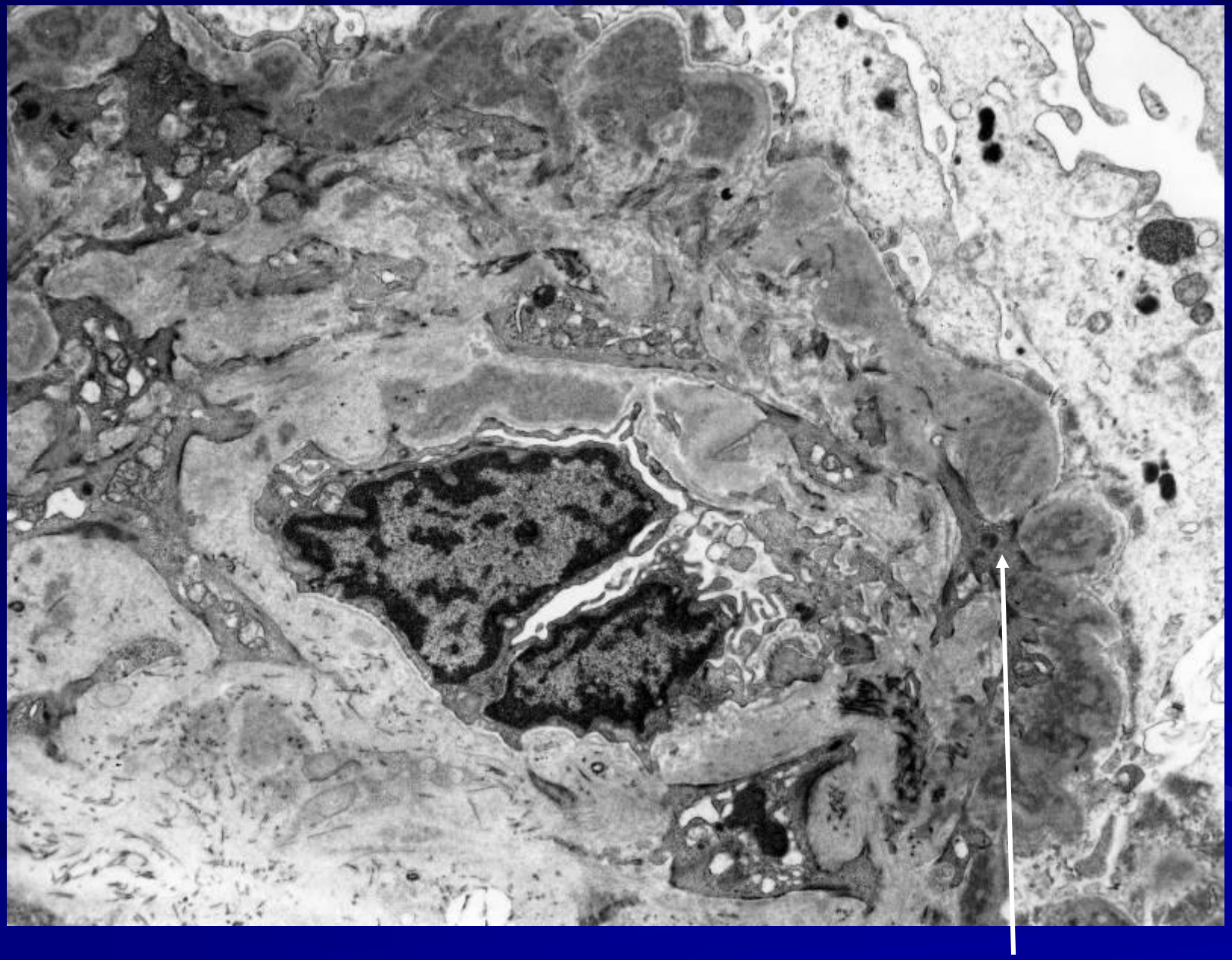
- Immunofluorescence: C3 mainly
- Can be occasionally confused with subacute postinfectious GN



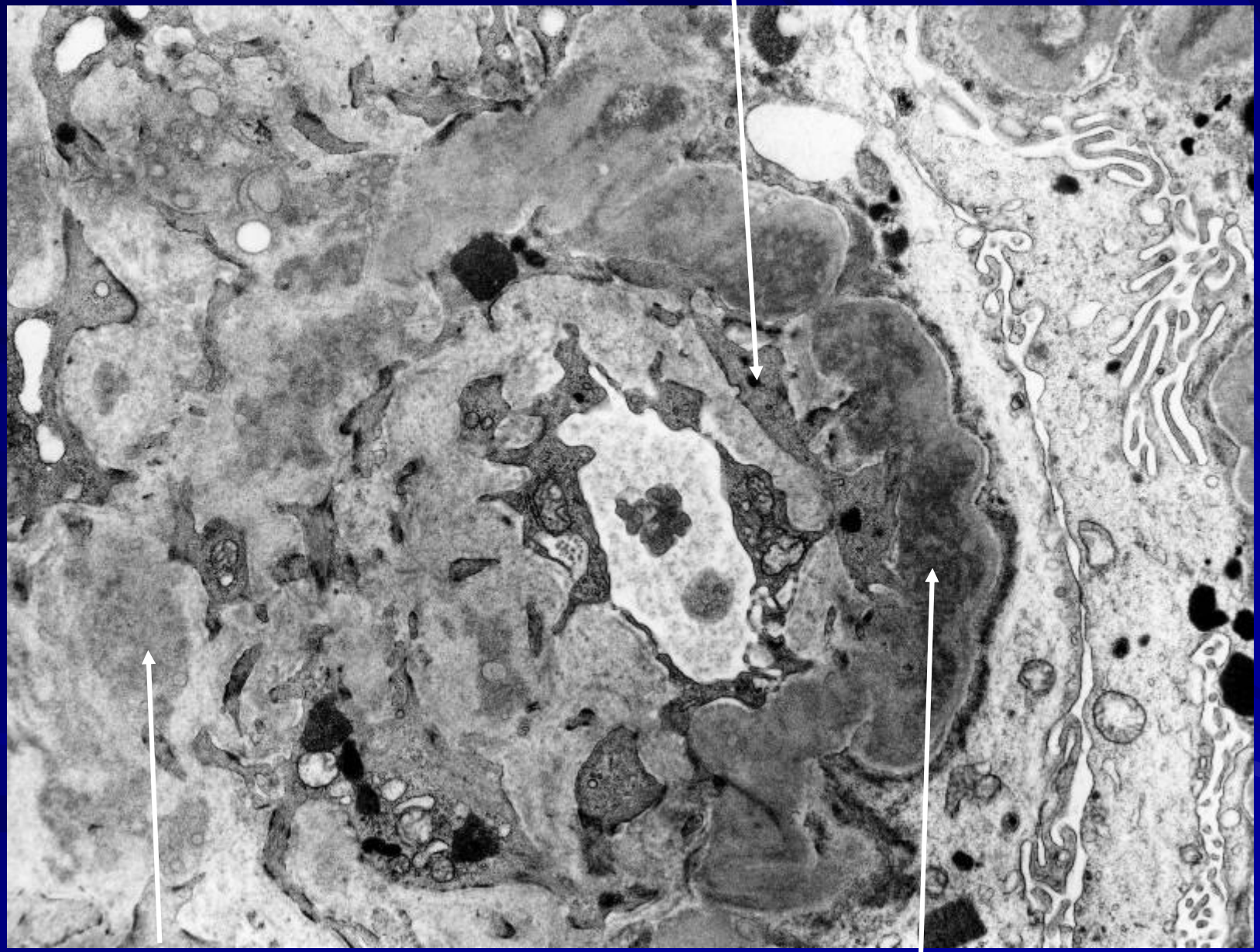
Accentuation of lobular architecture



Accentuation of lobular architecture

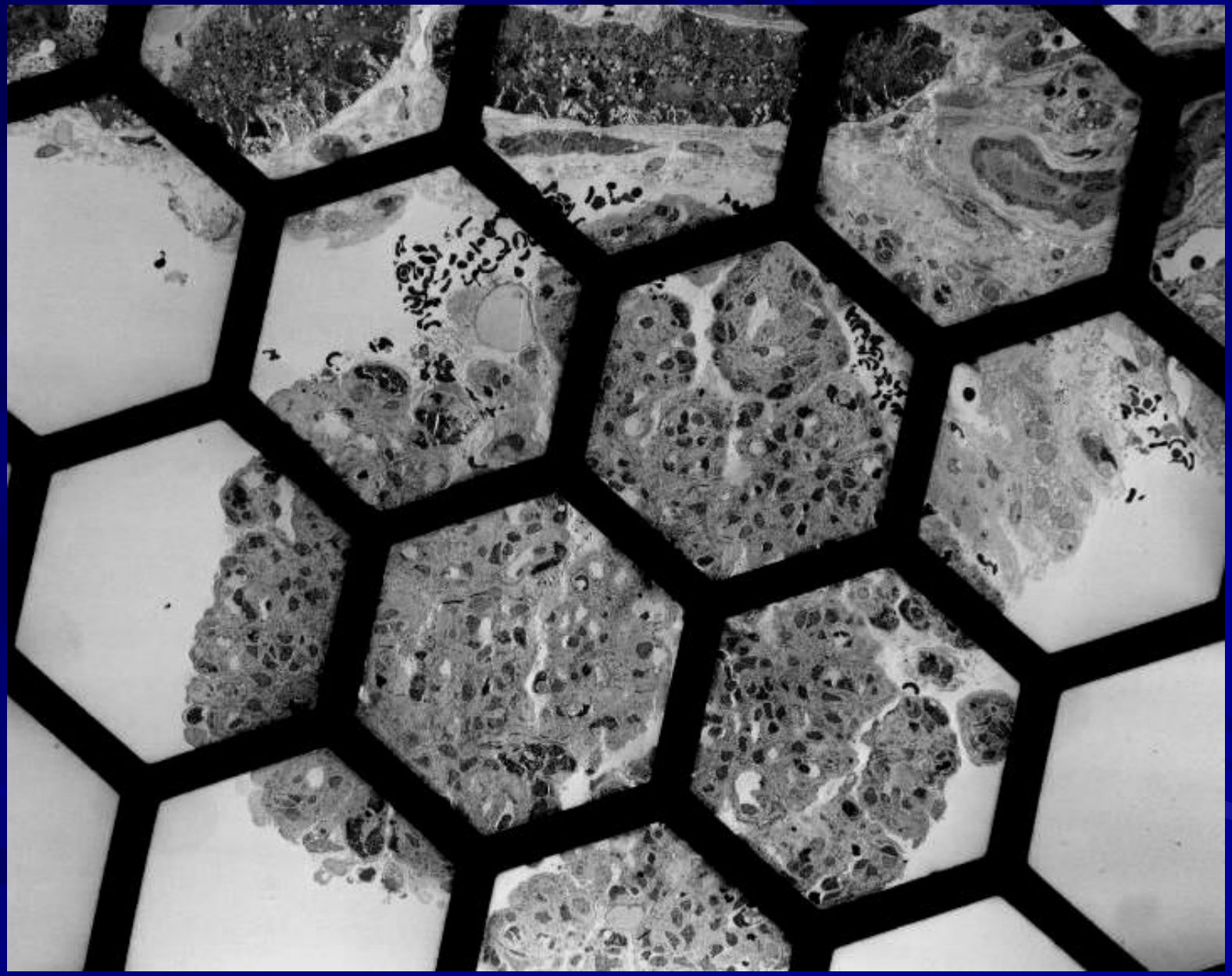

Mesangial interposition

Mesangial interposition in response to subendothelial deposits

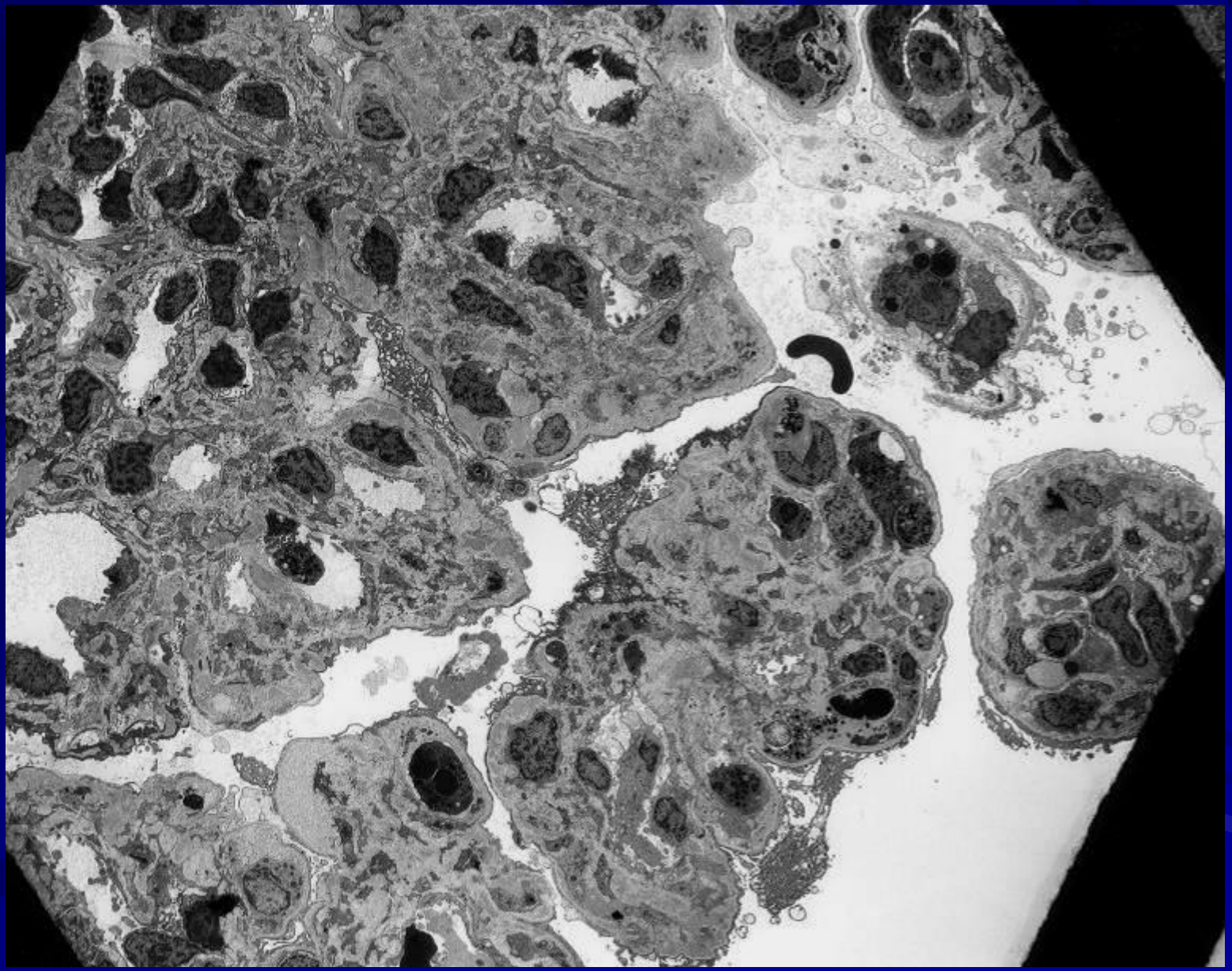


Mesangial deposits

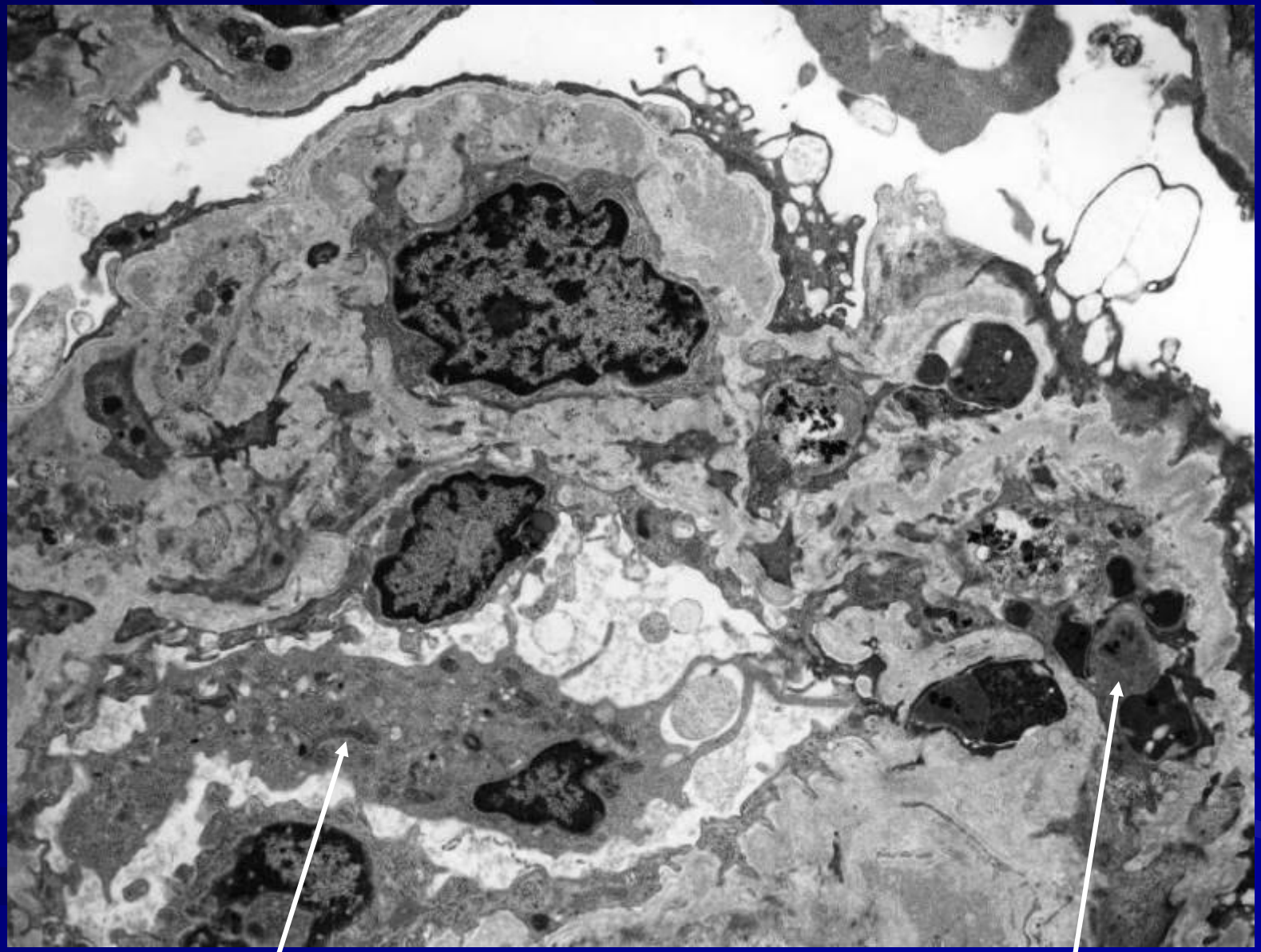
Deposits are ‘moth eaten’



Hypercellular nodular glomerular sclerosis

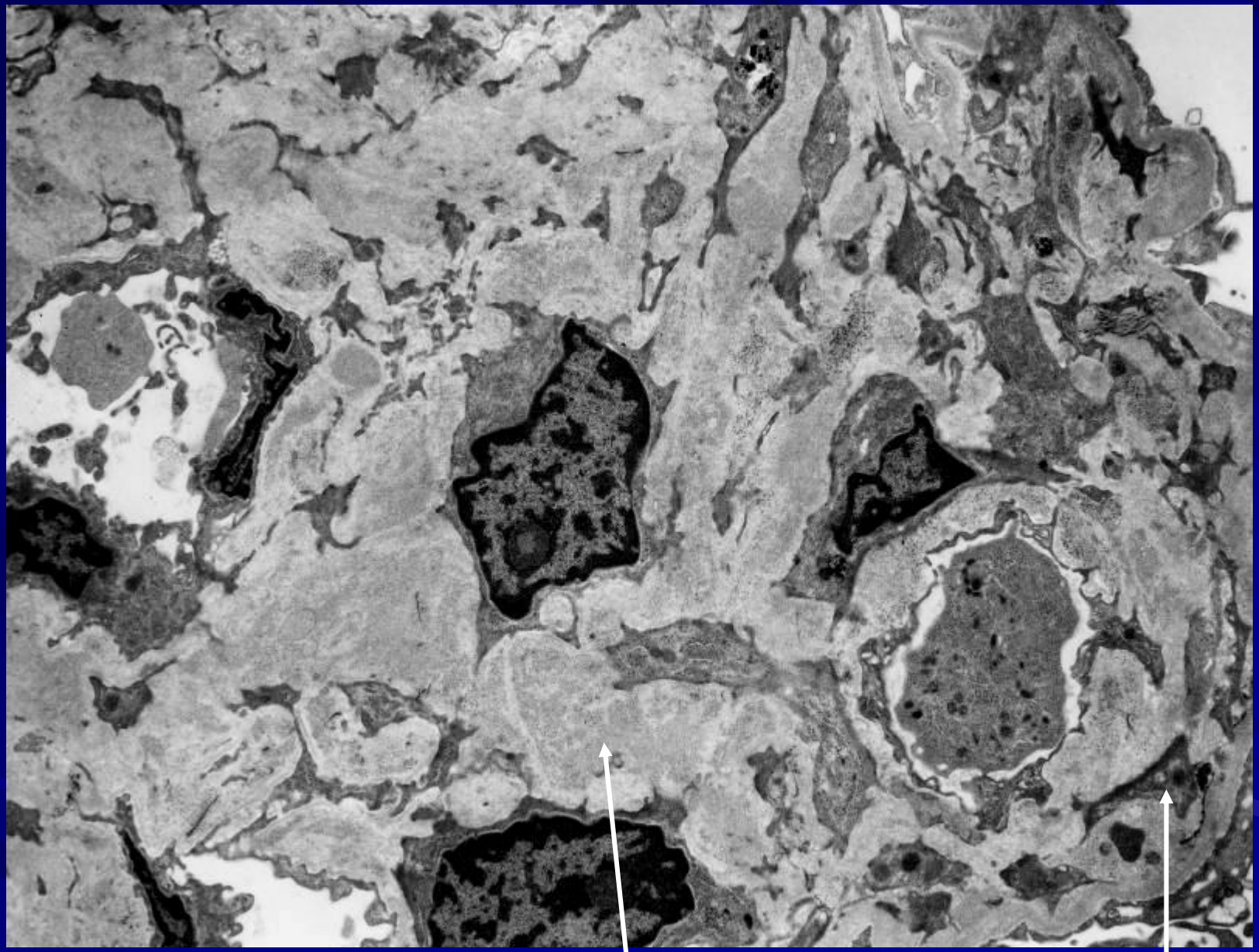


Hypercellular glomerulus



Monocyte interacting with endothelium

Mesangial interposition


Mesangial matrix expansion – numerous deposits
Mesangial interposition

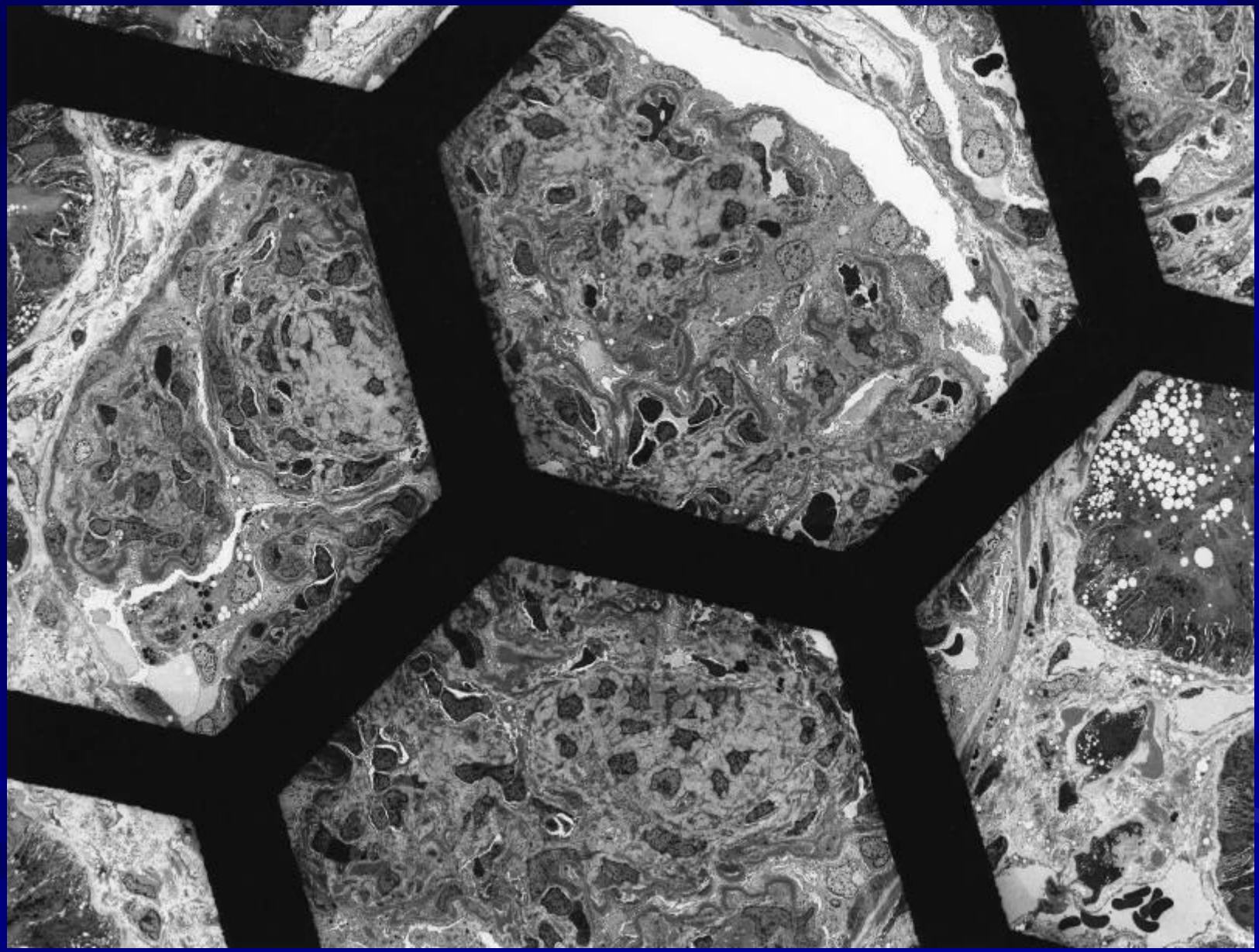
MCGN / MPGN type 2

or

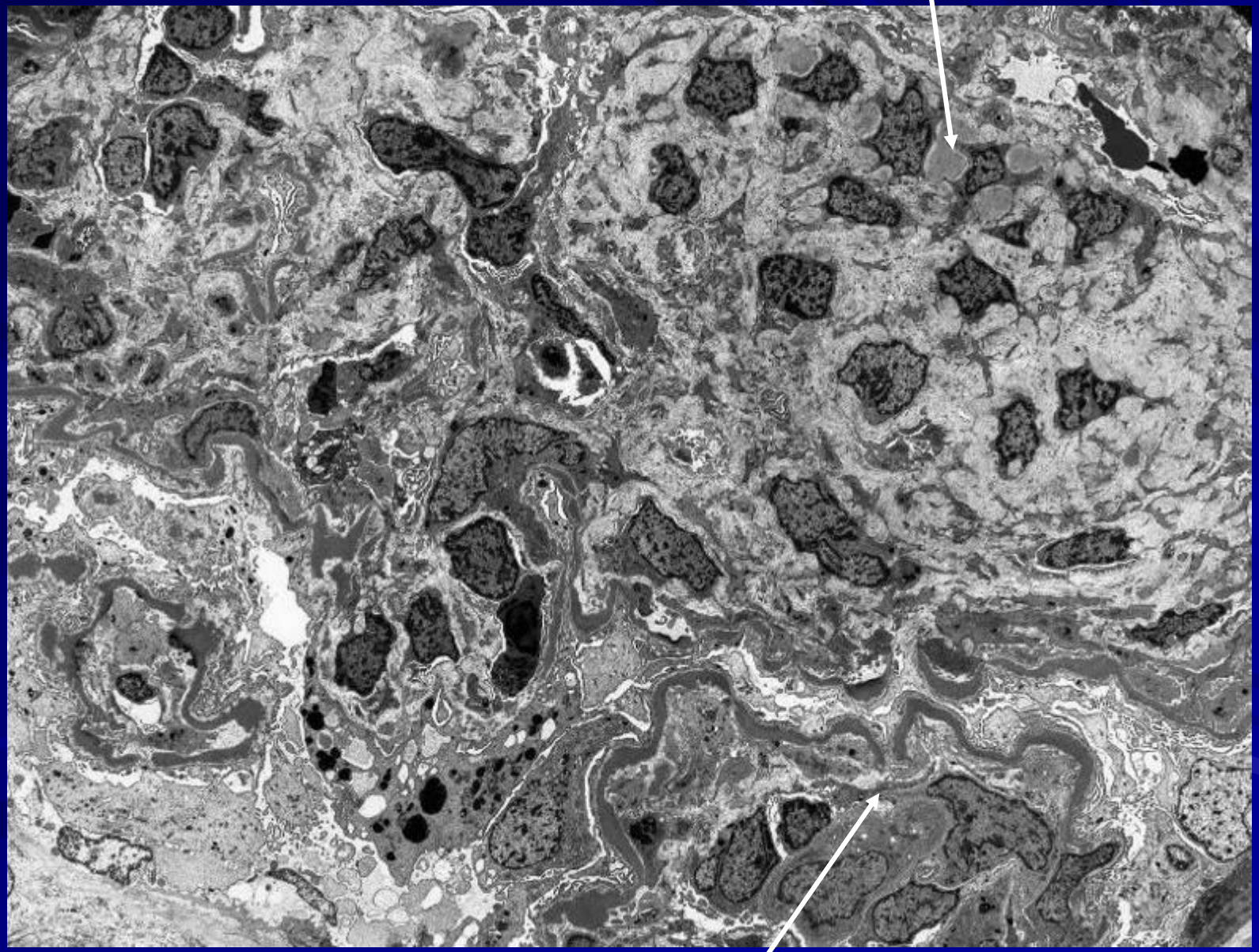
Linear dense deposit disease

or

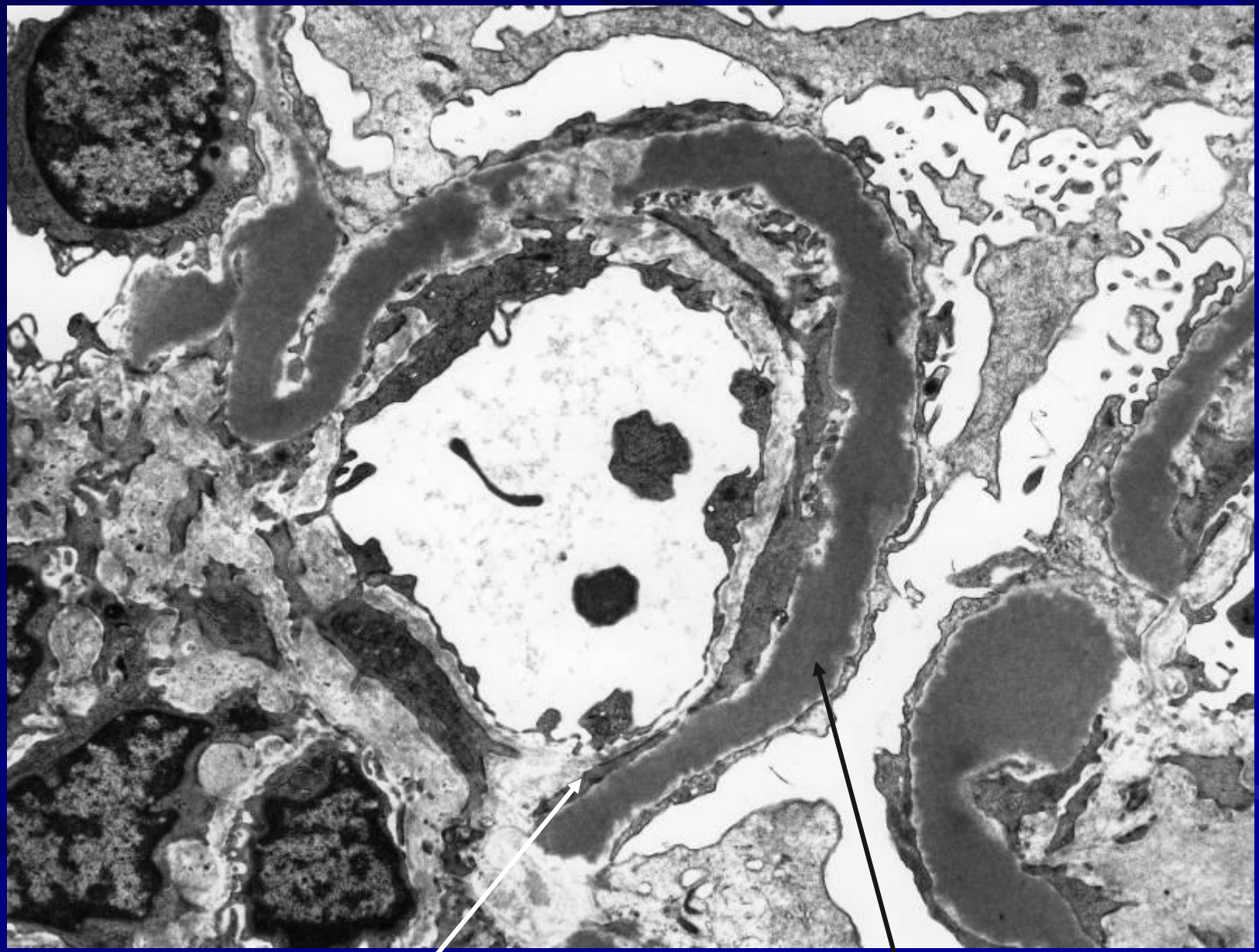
Dense deposit disease



Nodular glomerular sclerosis

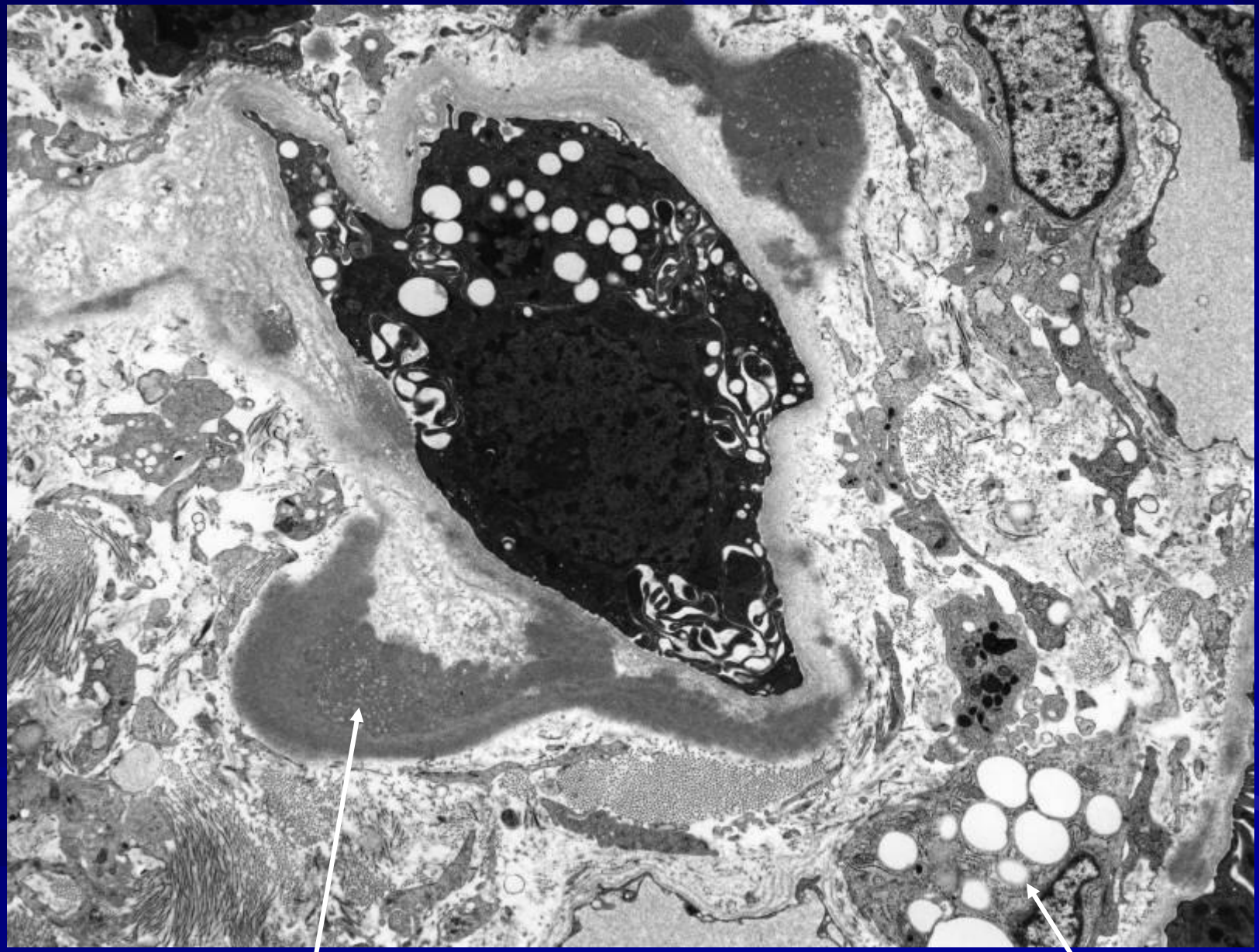

Mesangial deposits
Interrupted linear dense deposits

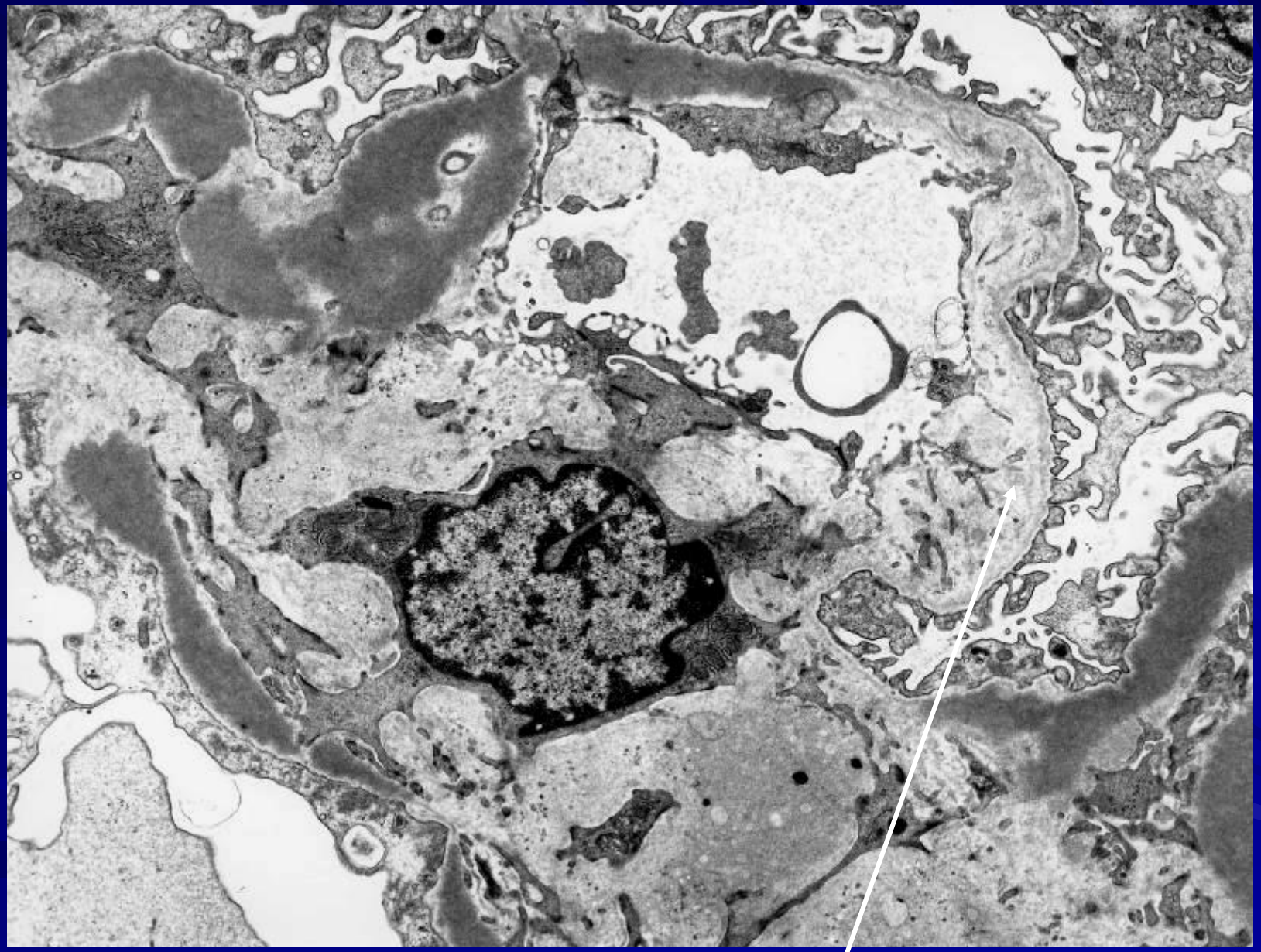
LDDD or MCGN type II



Mesangial interposition (between deposit and endothelial cell)

Linear dense deposit


Dense deposit around tubular basement membrane
Interstitial foam cell



Subendothelial expansion but no deposit or interposition

Membranous Glomerulonephritis

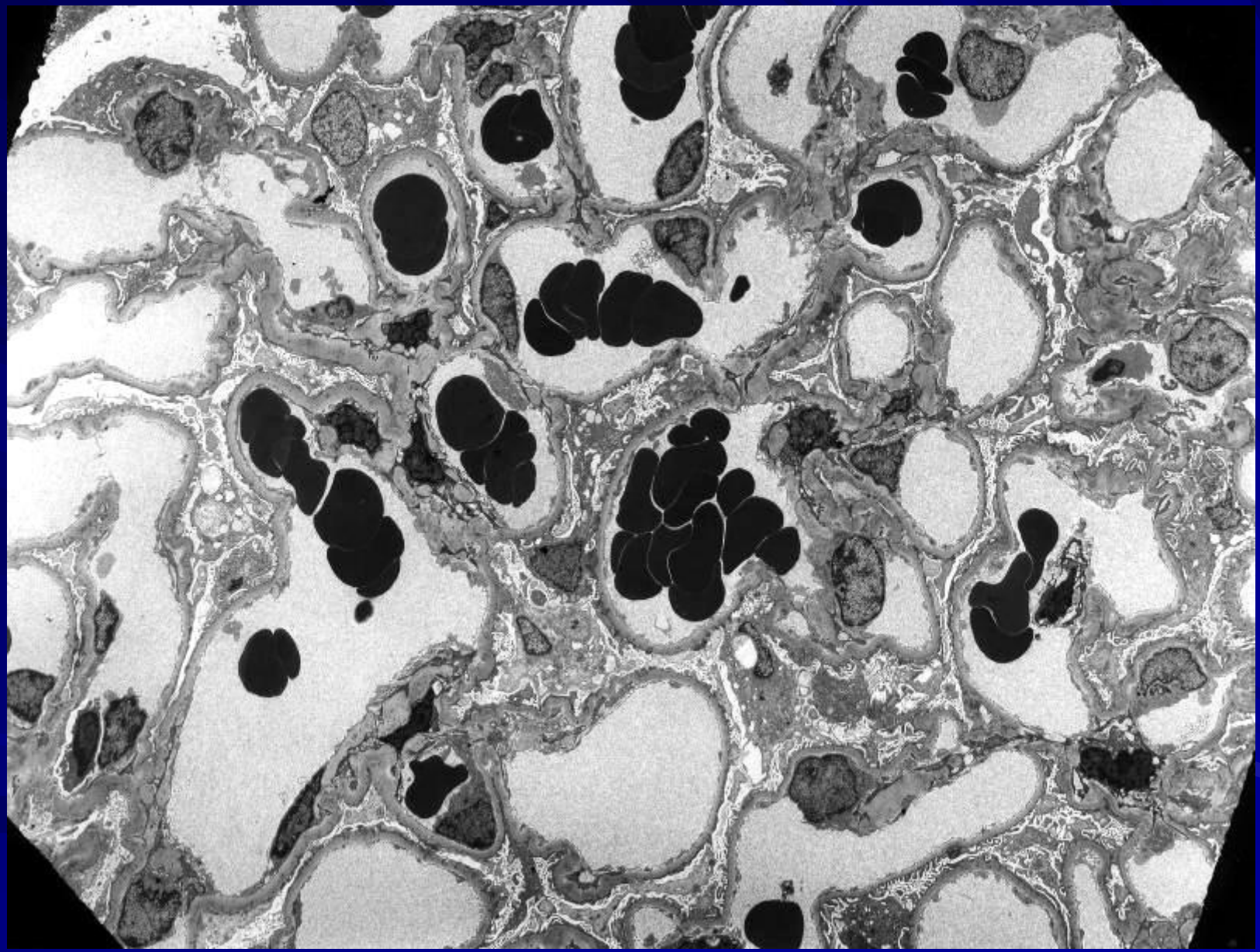
Membranous Glomerulonephritis

- Stage 1: Small subepithelial deposits – no spikes on silver stain
- Stage 2: New basement membrane around lateral border of deposits – spikes present on silver stain
- Stage 3: Occasional lysed deposit, occasional new basement membrane between deposit and podocyte
- Stage 4: Occasionally find mesangial cell undergoing interposition, glomerulosclerosis – silver stain chain rope

Membranous GN

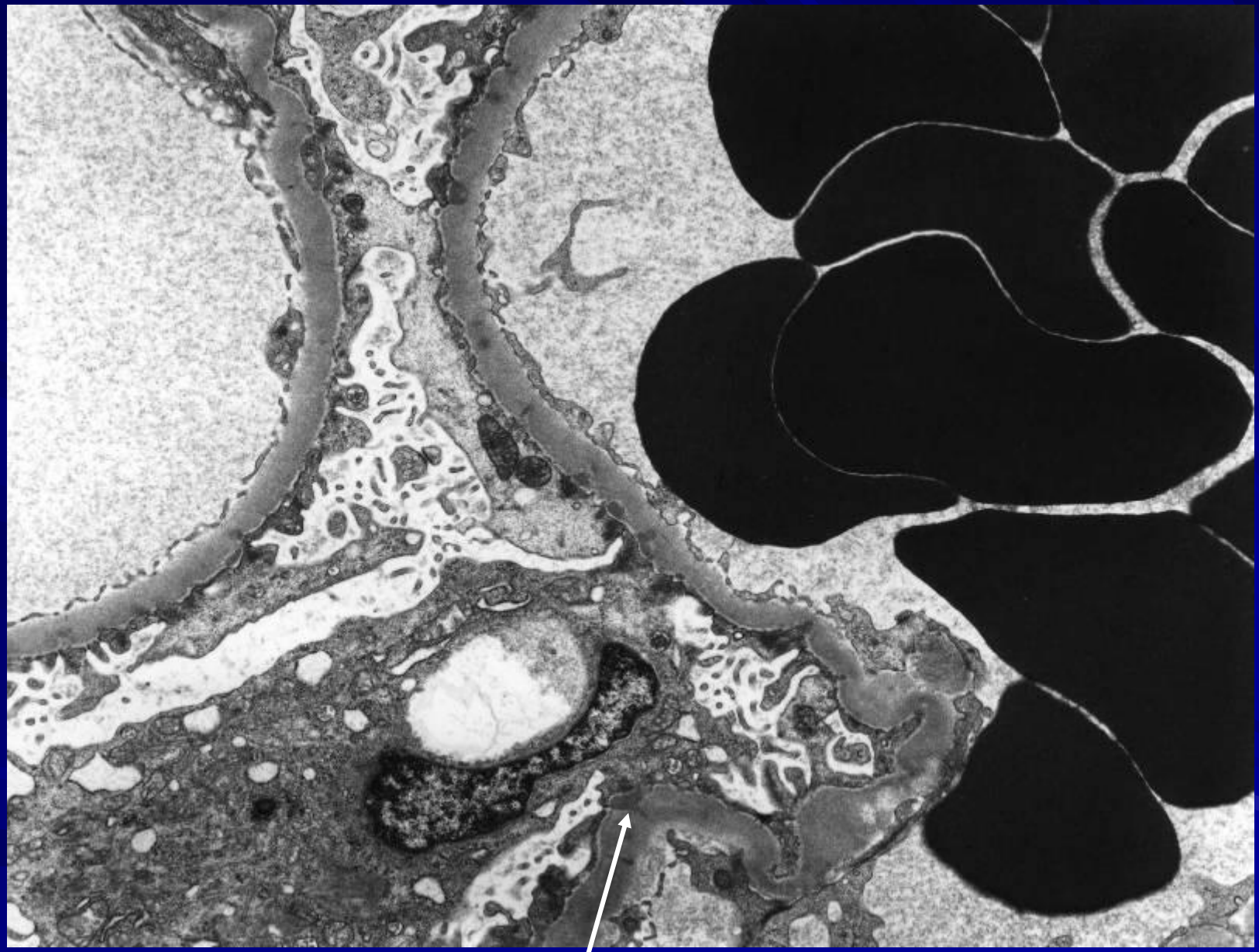
- Can find different stages on different loops
- Therefore stage is usually bracketed

Stage 1 membranous



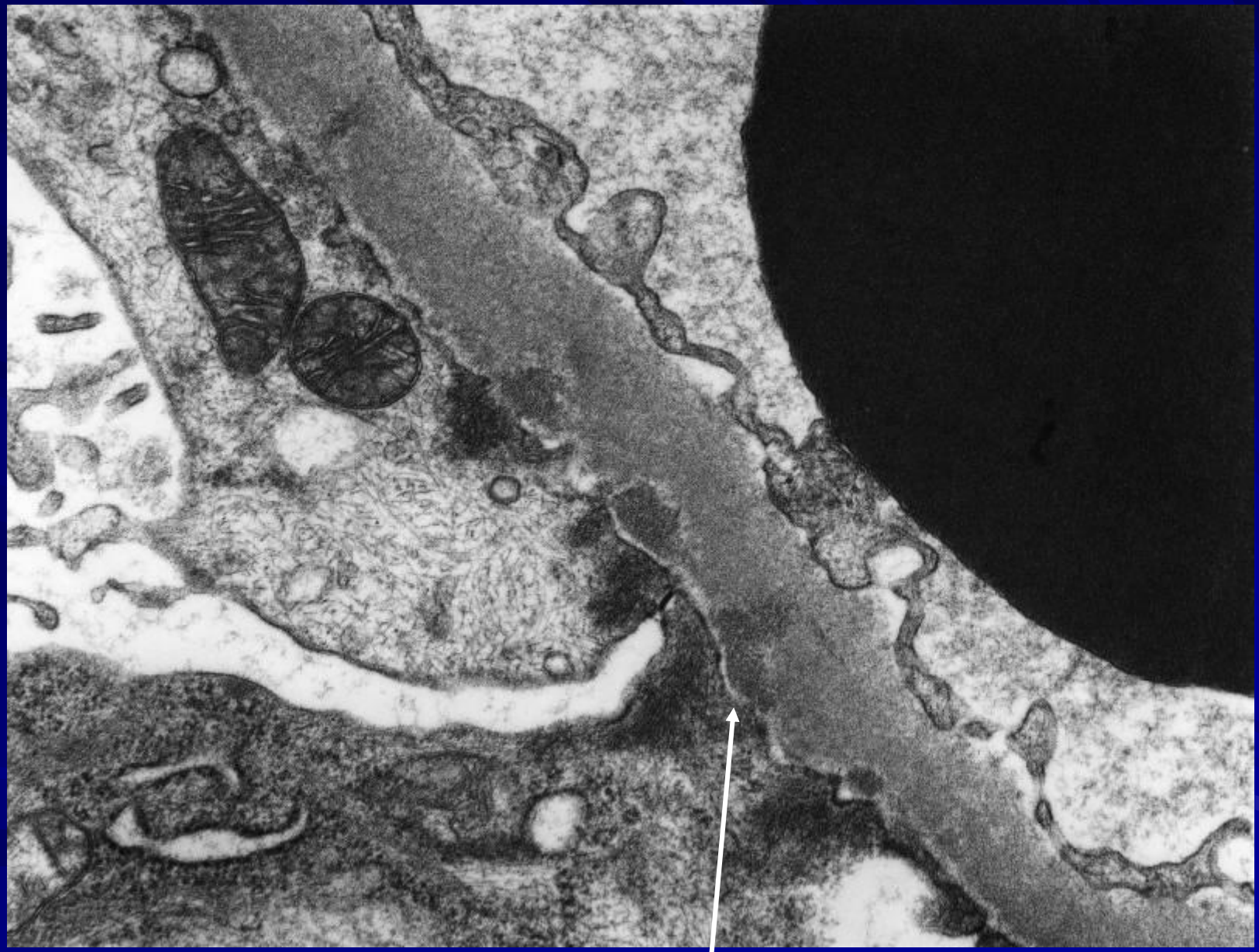
Appears similar to minimal change at low magnification

Stage 1 membranous



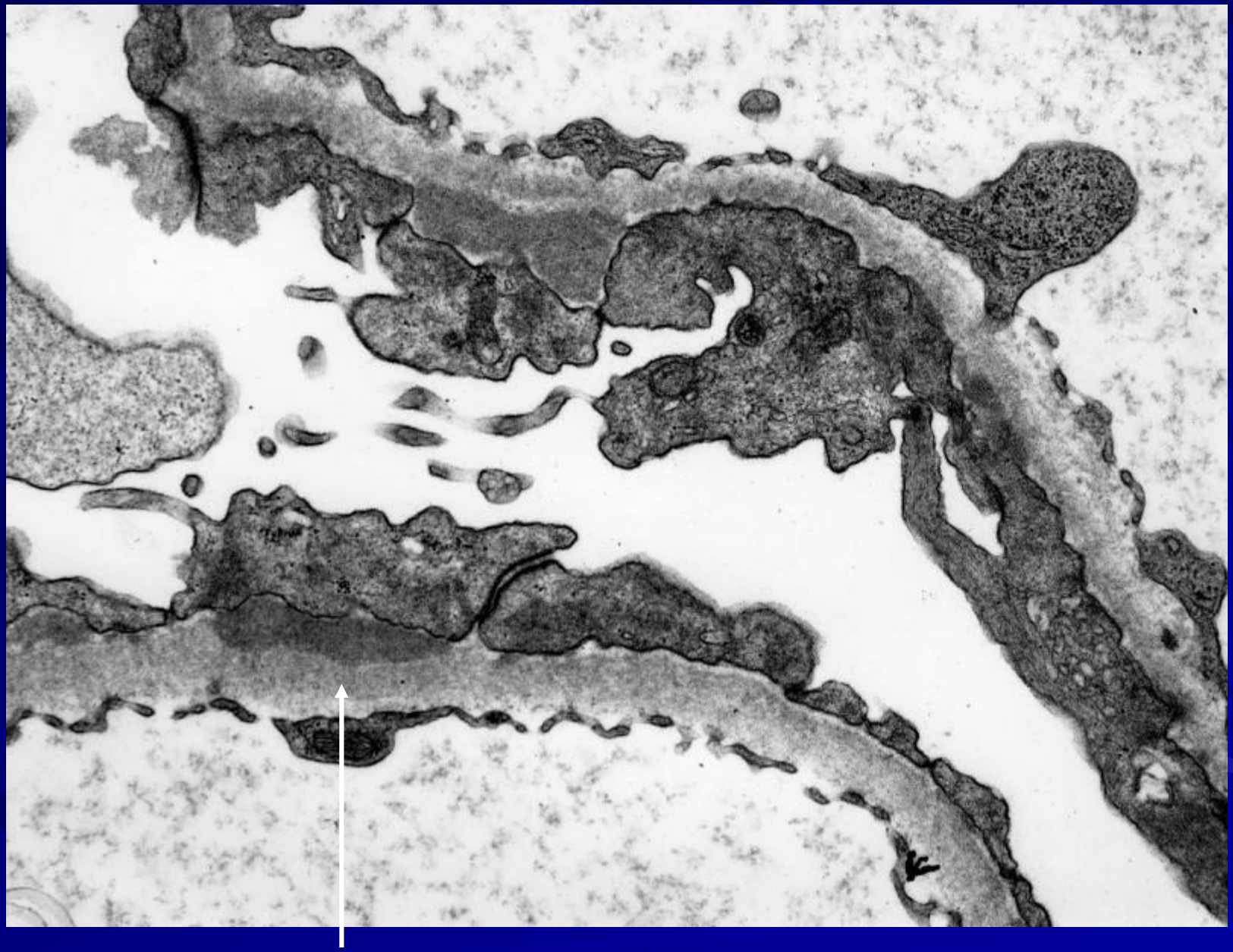
Tiny subepithelial deposits

Stage 1 membranous



Moderate numbers of small subepithelial deposits (IgG C3)

Stage 1 membranous

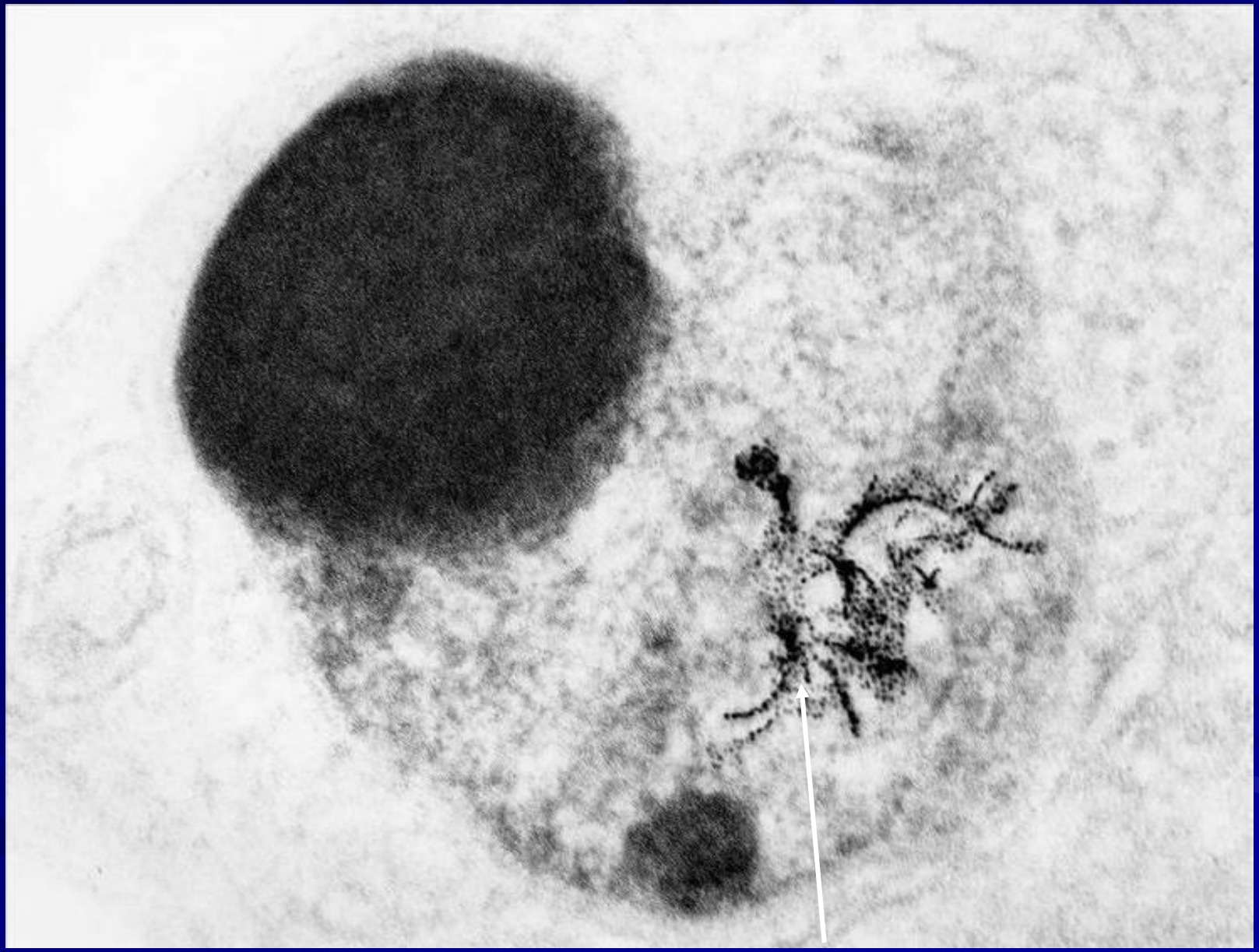


Occasional small epithelial deposits

Stage 1 membranous

Mesangial cell lysosomes

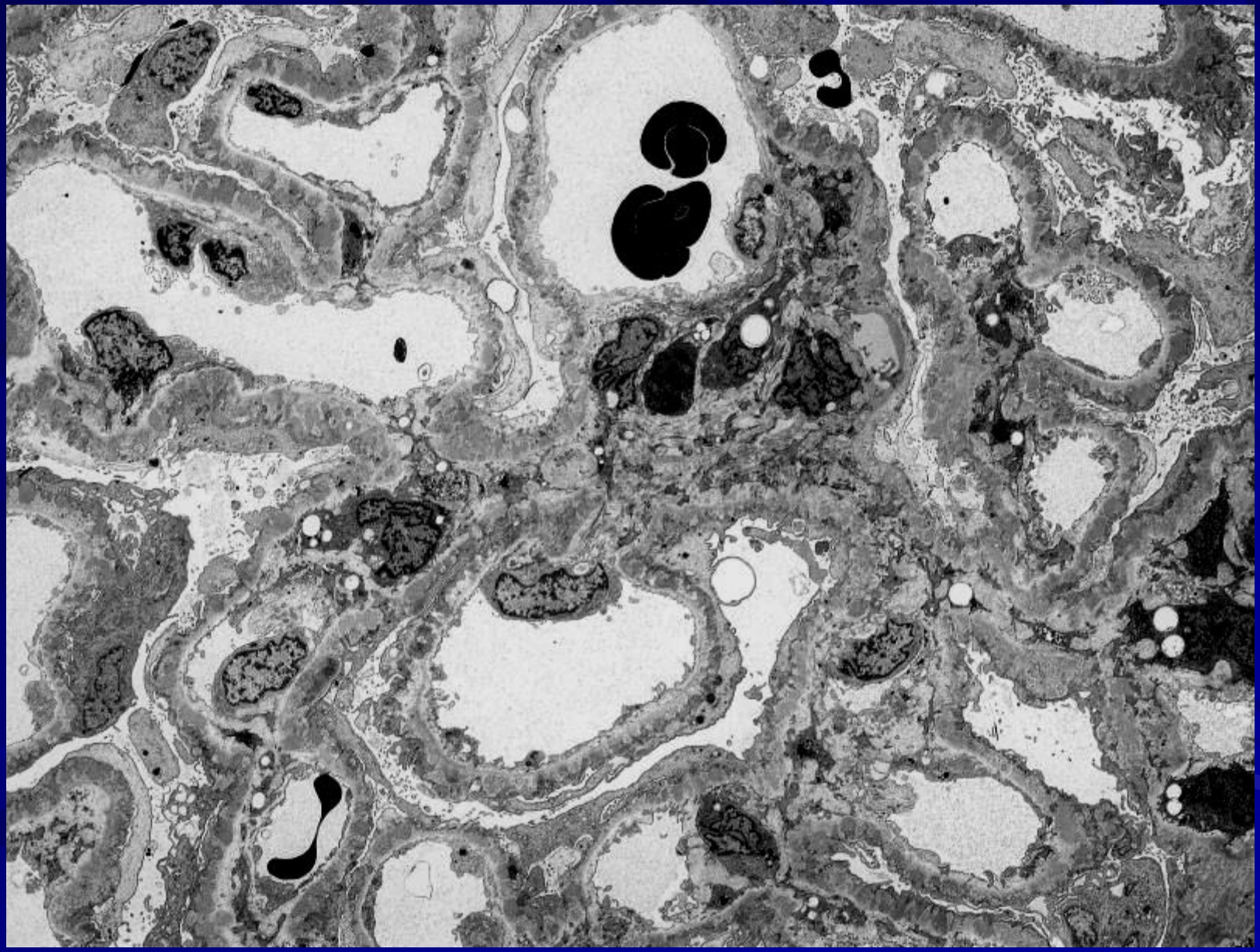
Stage 1 membranous



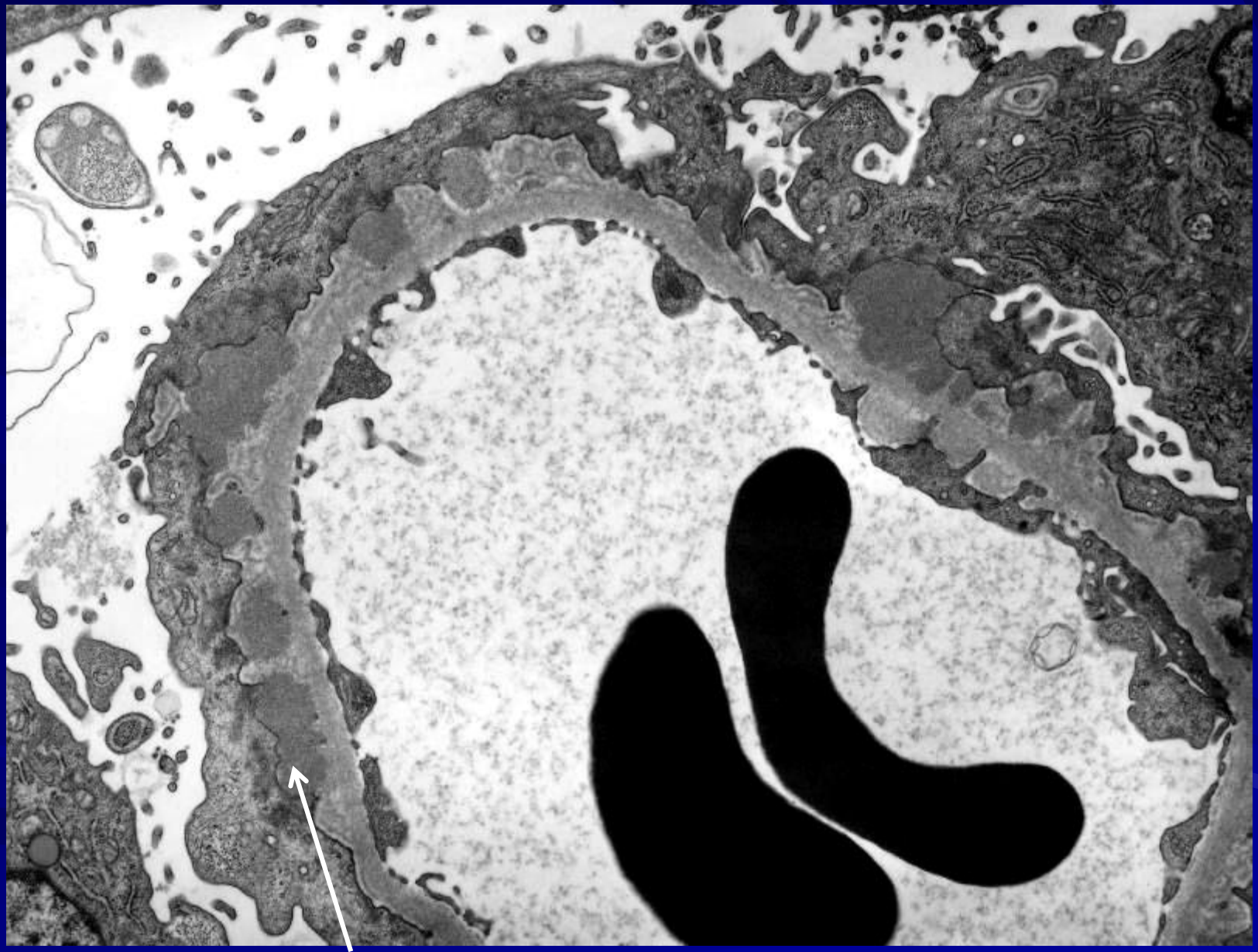
Unstained section

Intralysosomal aurosomes / colloidal gold

Stage 2 membranous



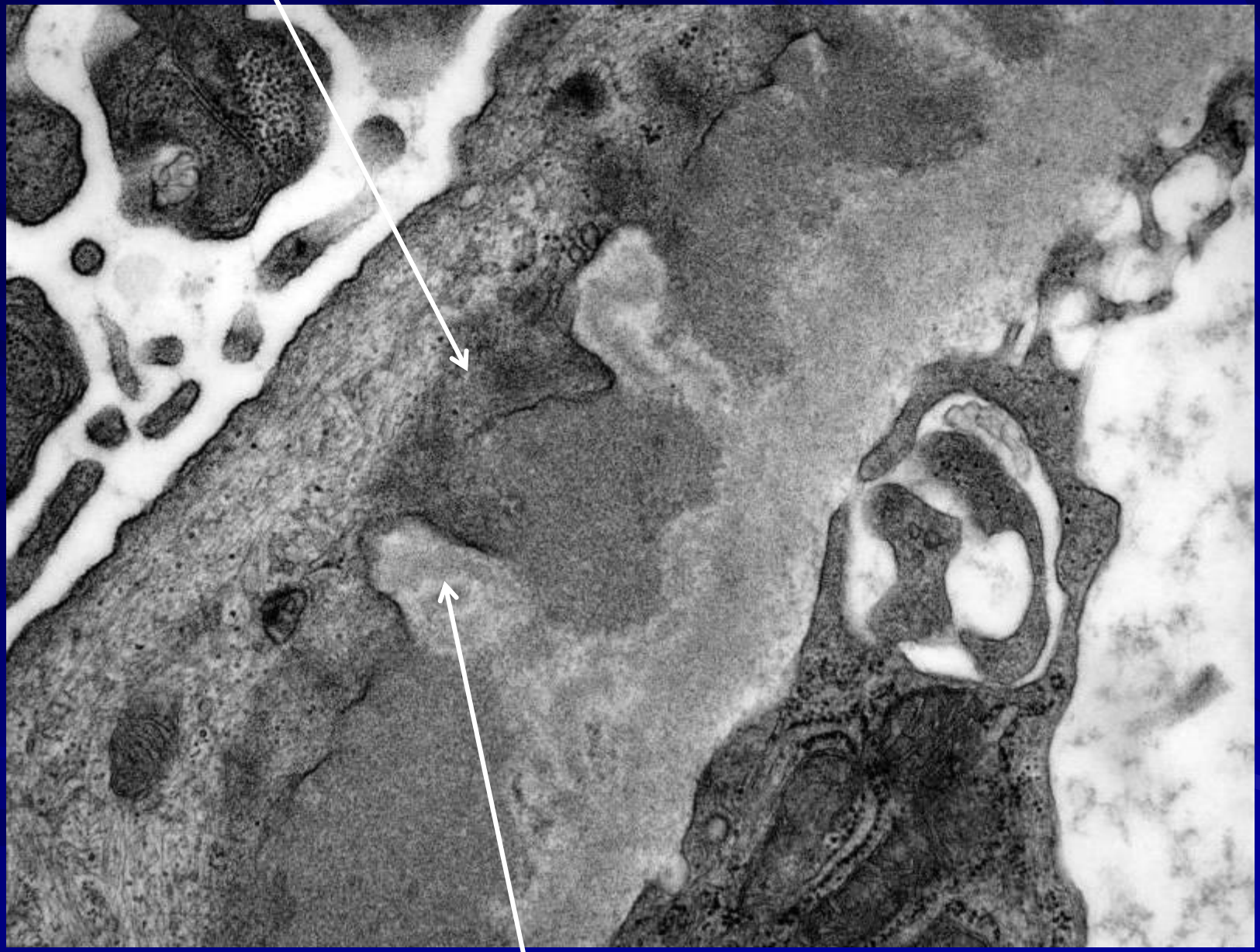
Stage 2 membranous



Numerous medium sized subepithelial deposits

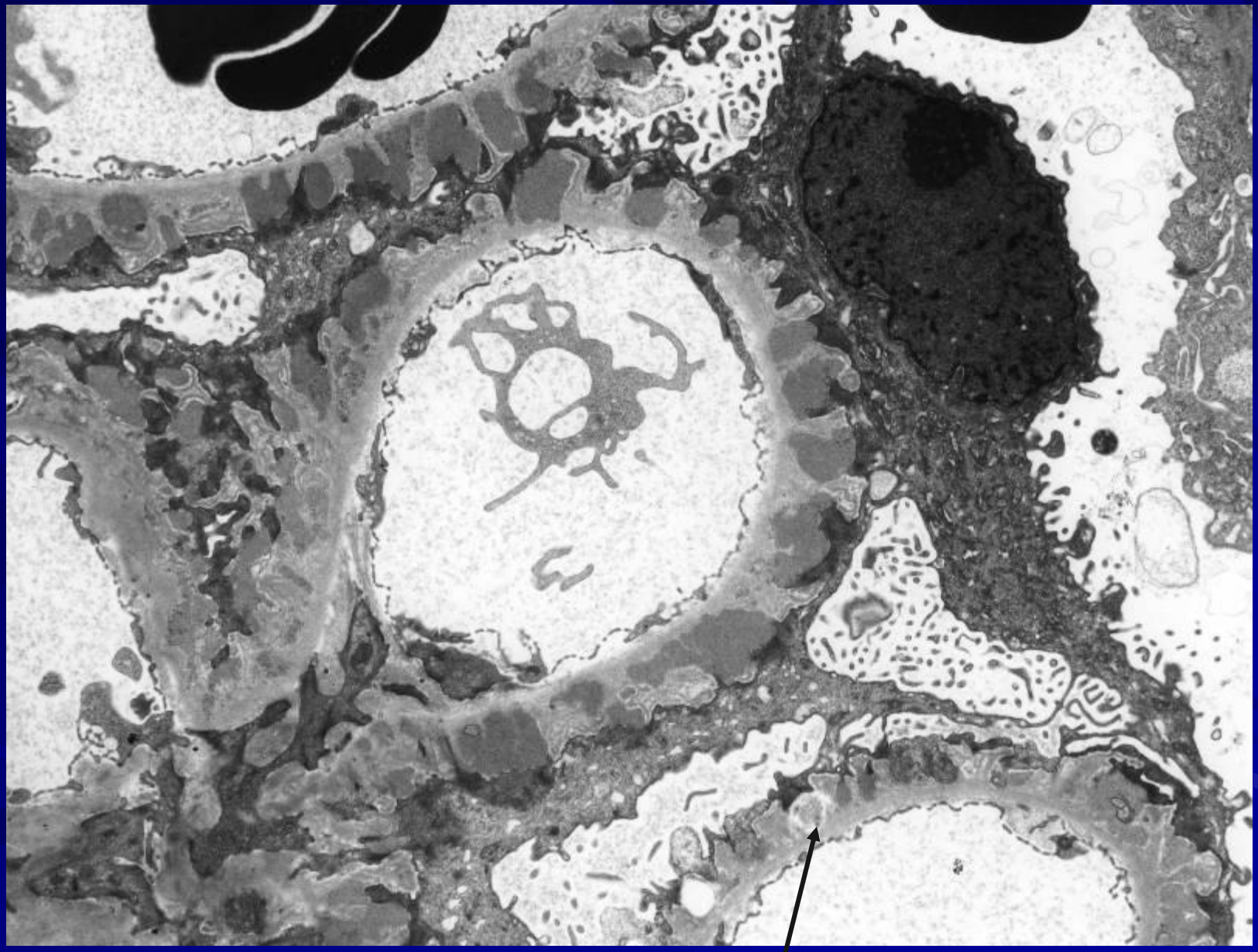
Aggregates of filamentous actin in podocyte

Stage 2 membranous

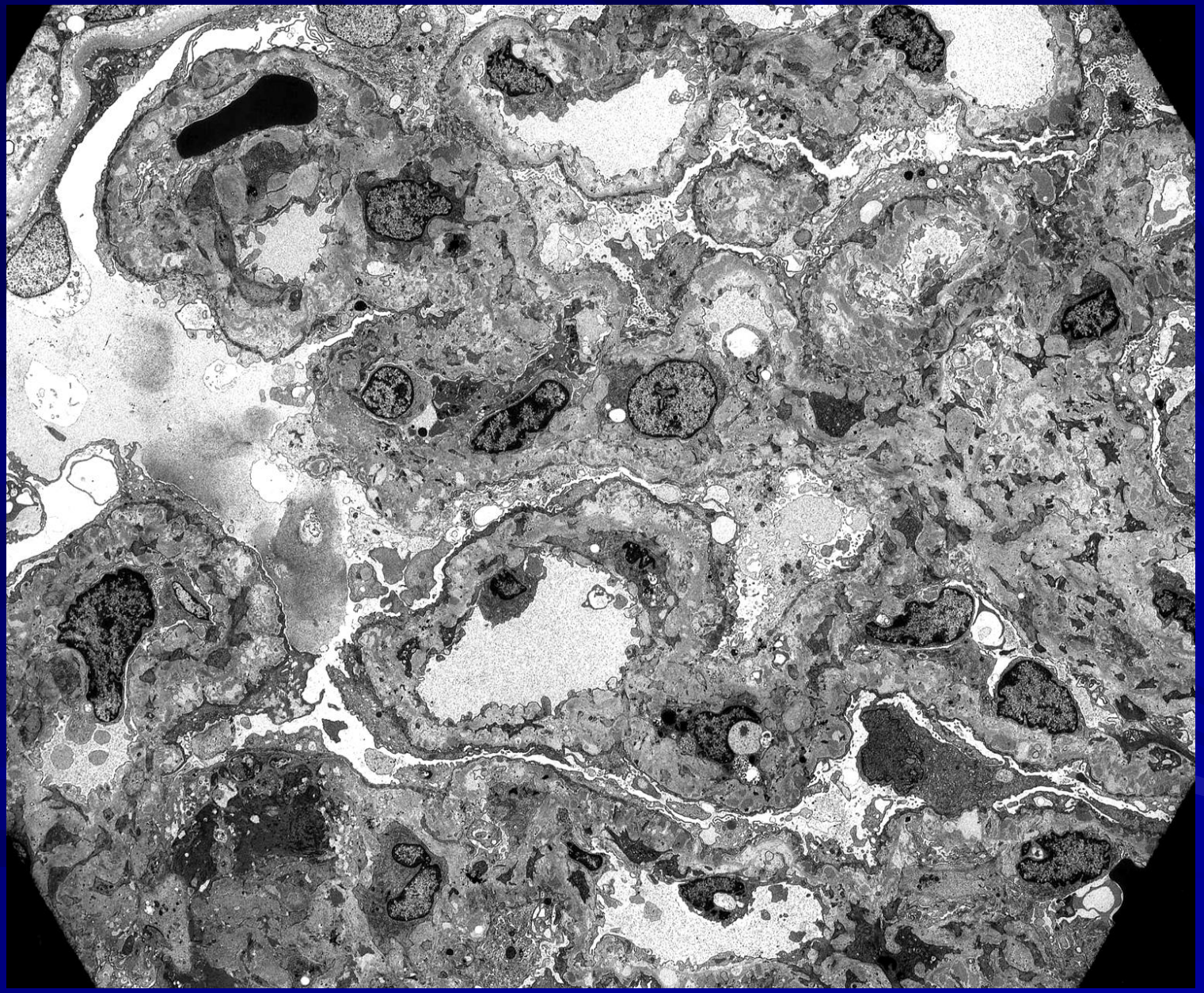


New basement membrane between subepithelial deposits – forming spikes

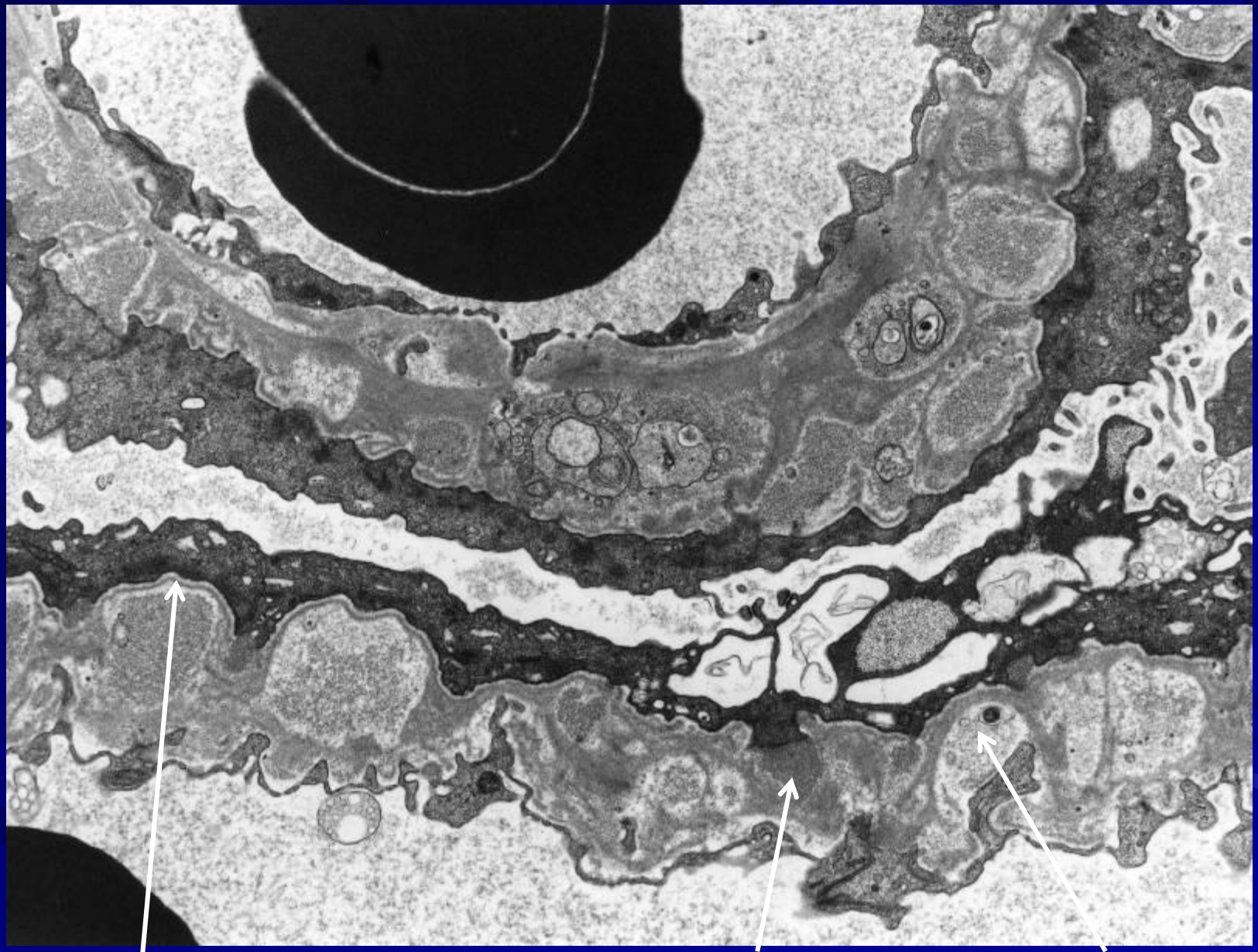
Stage 3 membranous



Stage 4/chronic membranous



Stage 4 membranous



Deposits undergoing incorporation

Fresh deposit

Lysis of deposits

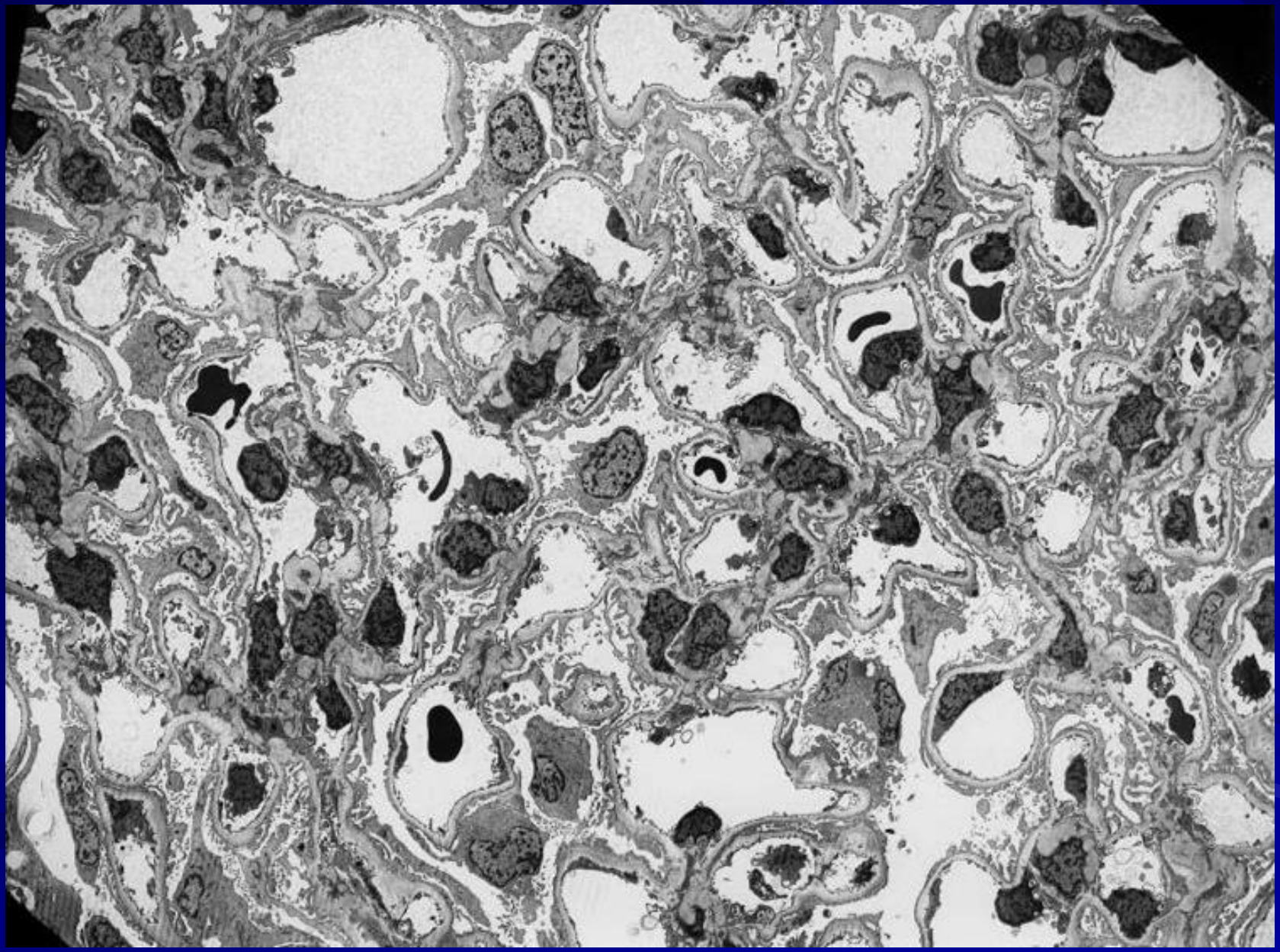
Minimal Change Nephropathy

Minimal Change Nephropathy

- Histologically normal glomeruli in context of nephrotic syndrome
- Trace IgM on IF

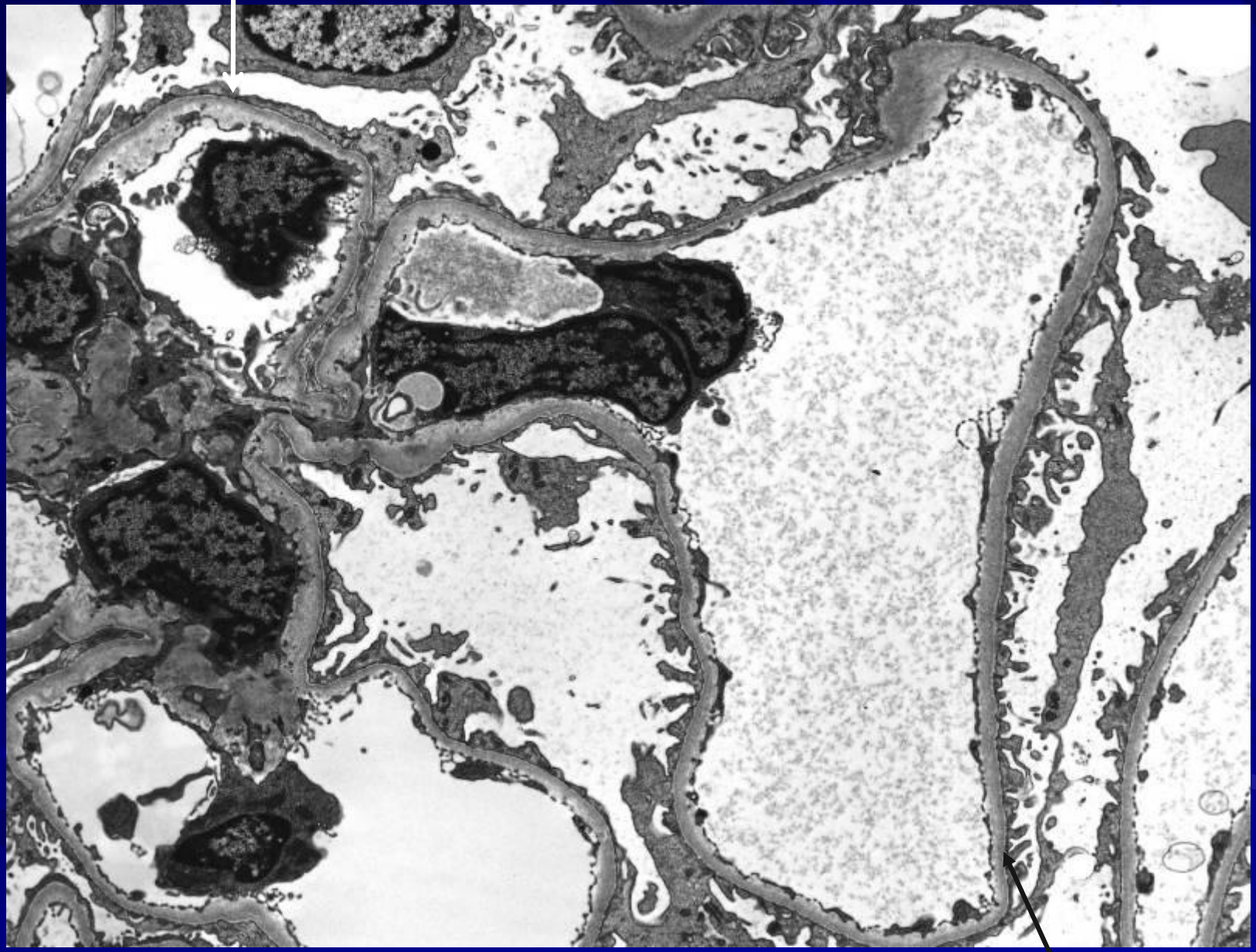
Caveat

- Not a good correlation between level of proteinuria and extent of foot process effacement within a single glomerulus due to variability of degree of pathology between glomeruli.
- Proteinuria reflects mean of foot process effacement.

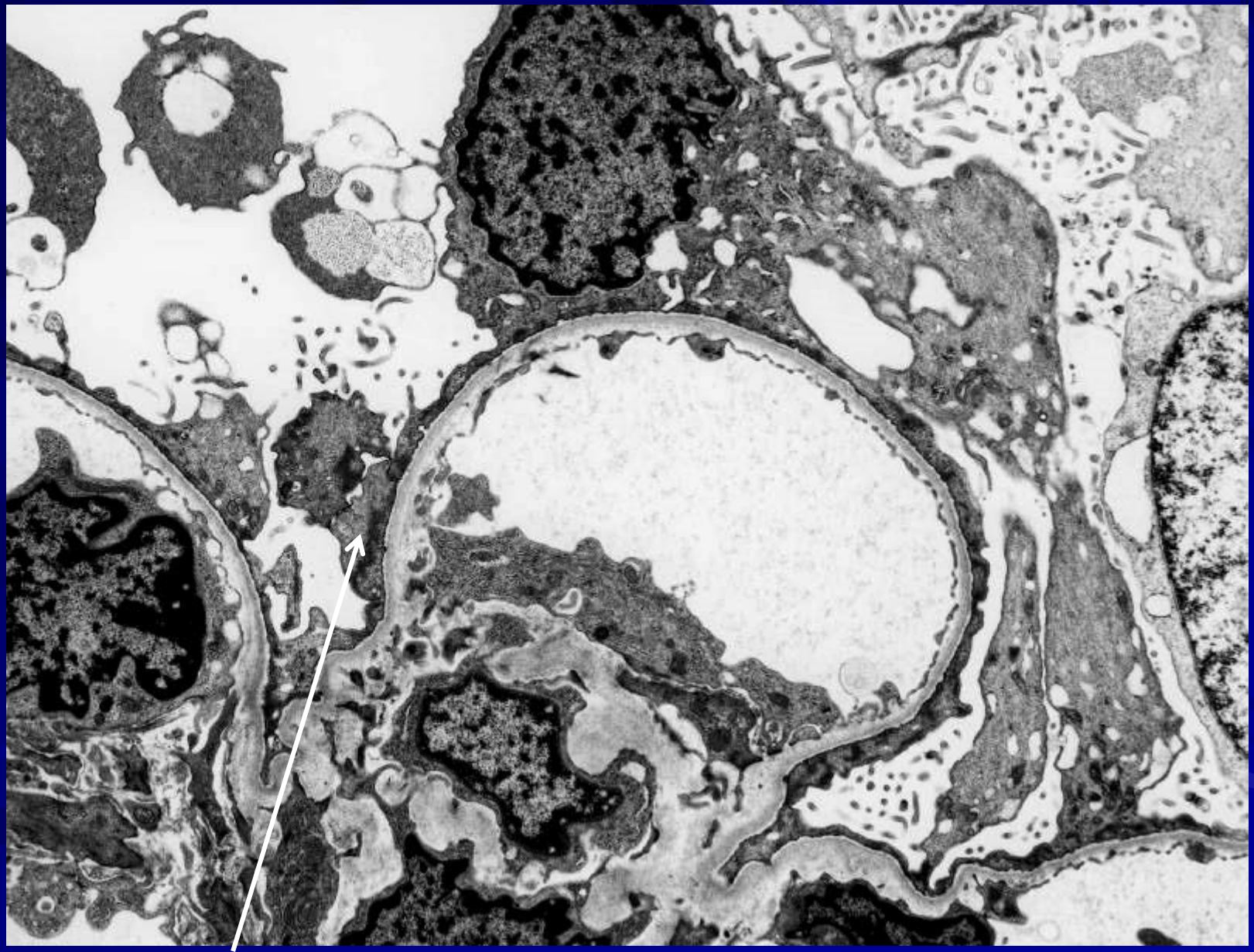


Normal-looking glomerulus

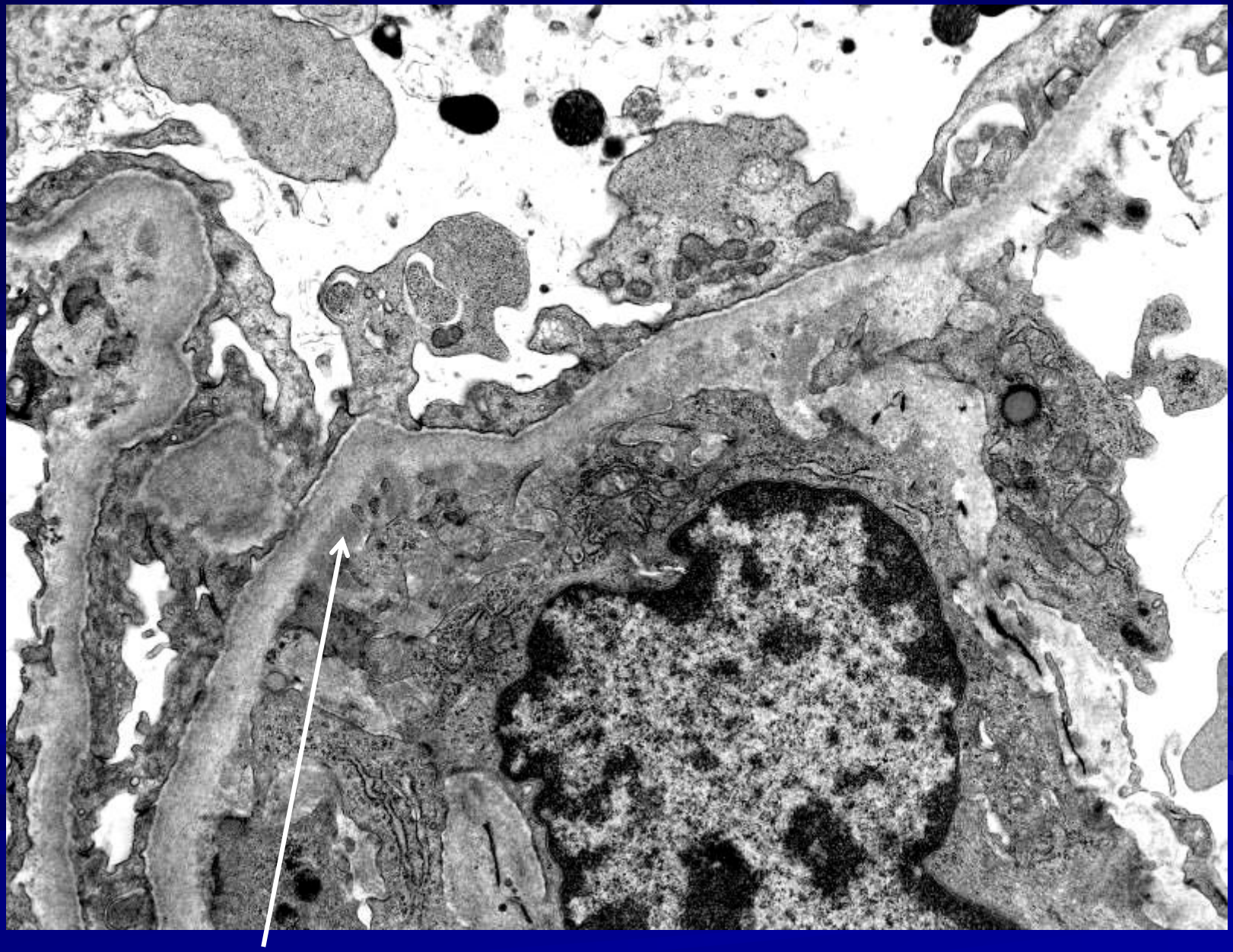
Foot processes effaced



Normal foot processes occasionally



Foot process effacement


Tiny mesangial deposits (IgM)