



EM and the diagnostic process in renal pathology: cases from the UK Renal EQA scheme

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Oxford University Hospitals **NHS**
NHS Trust

Diagnostic process in renal pathology

Step 1:

Formulate a differential diagnosis on the basis of the information on the request card – age, sex, clinical features, urinalysis, urine microscopy, biochemistry, immunology. Why have the nephrologists done the biopsy? What information do they want from me?

Step 2:

Provide a morphological label:
 where is the abnormality?
 what is the pattern of disease?

Step 3:

Refine the morphology to a diagnosis using clinical information, immunohistochemistry & electron microscopy

Step 4:

Quantify activity and chronicity (grade and stage)

UK National Renal Pathology EQA Scheme

Diagnostic EQA scheme with oversight by Royal College of Pathologists

All UK pathologists reporting renal medical biopsies must take part

Aims – education, identification of substandard performance

The first diagnostic EQA scheme in the UK

Set up by Prof Peter Furness in 1992

Current organisers – Ian Roberts, Maria Soares

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Process

Independent diagnosis of renal biopsies (digital slides and images on Oxford Pathology platform)



Review of cases at participant meeting – scoring agreed by majority vote



Participants receive personal scores for their diagnoses

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UK National Renal Pathology EQA Scheme

GO

Participant Number: 320

Cell:

Circulation Number: Z

Issue Date: 06 April 2023

Closing Date: 24 May 2023

Pre-meeting Report

Report

CPD

Print

Circulation Closed

RESULTS COMPLETED: 16 May 2023

Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
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Case number:

Z5

Case Type:

Renal Pathology

Clinical Information:

Deteriorating renal function Creatinine 197. Blood and protein in the urine (ACR 35). Infiltrative pathology on CT scan in renal parenchyma. Unexplained pancreatitis and biliary stricture. Rheumatoid factor positive. Raised IgG4. Low C4.

Specimen:

Native renal biopsy

Age:

64

Sex:

Female

Macroscopic description:

Two cores renal tissue 16mm and 13mm

Immunohistochemistry:

IgG and IgG4 stained sections provided. IMF images of IgG, kappa, lambda provided, C3 similar. No deposition of IgA IgM C4 or C1q. EM - no deposits in glomeruli, image of tubule provided.

View Slides:

[HE](#)

[PAS](#)

[IH IgG](#)

[IH IgG4](#)

[IF IgG](#)

[IF kappa](#)

[IF lambda](#)

[EM tubule](#)

Main Diagnosis:

Popularity:

Please offer a single diagnosis if possible. If a differential diagnosis is necessary, please indicate your opinion of the probability of each diagnosis by assigning a score to each, such that the total adds up to 10 (ten).

Tubulointerstitial nephritis IgG4-associated disease

10

Case Number: Z2

Number of responses: 77. Date of analysis: 24 May 2023

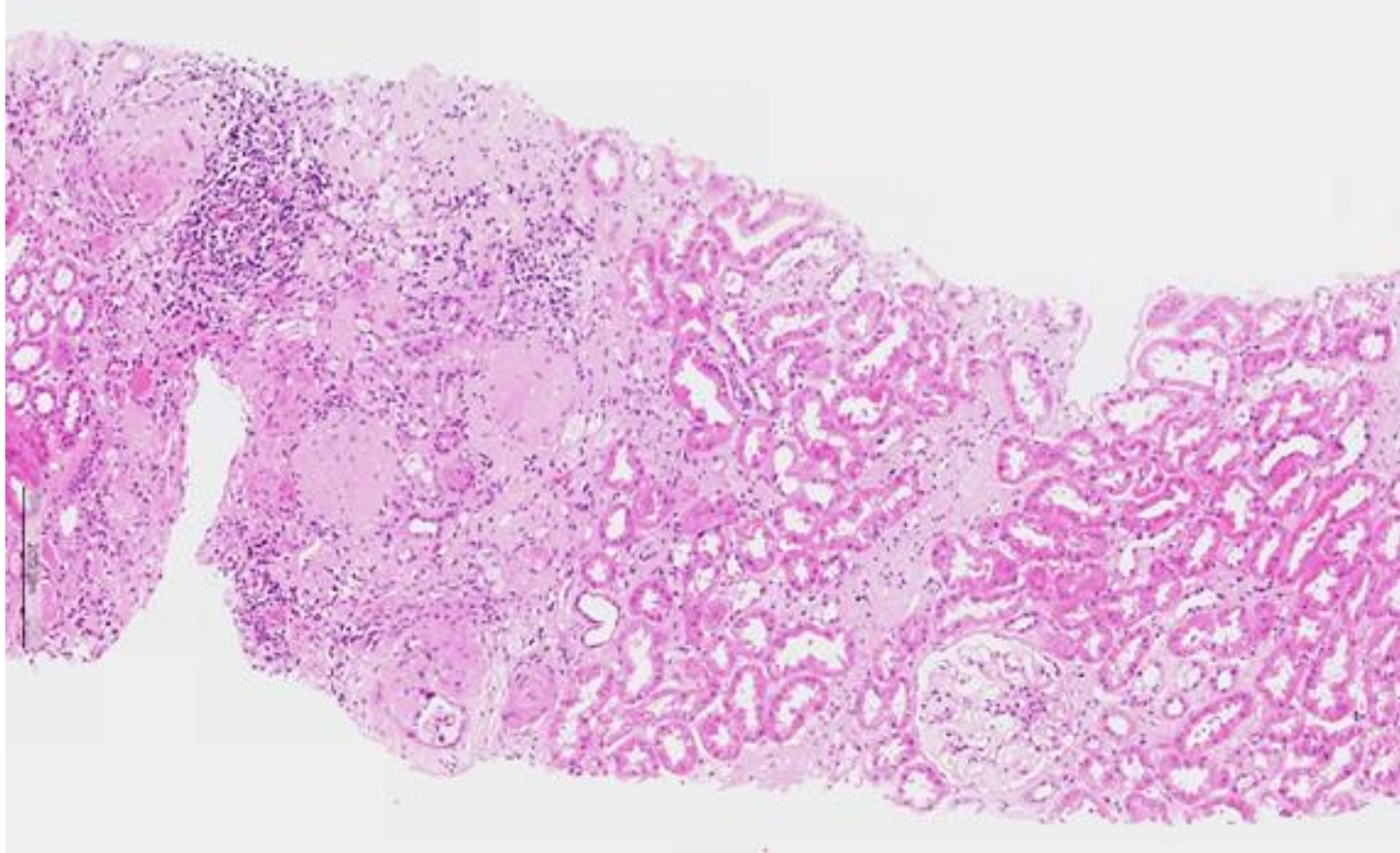
Clinical: Male 36. Fatigue, impaired GFR, proteinuria, no haematuria, intermittent loin pain. Raised IgA level. Bladder thickening on CT, but normal kidneys. ECG suggestive of hypertrophic obstructive cardiomyopathy. ?IgA ?FSGS ?storage disorder

Specimen: Renal biopsy core

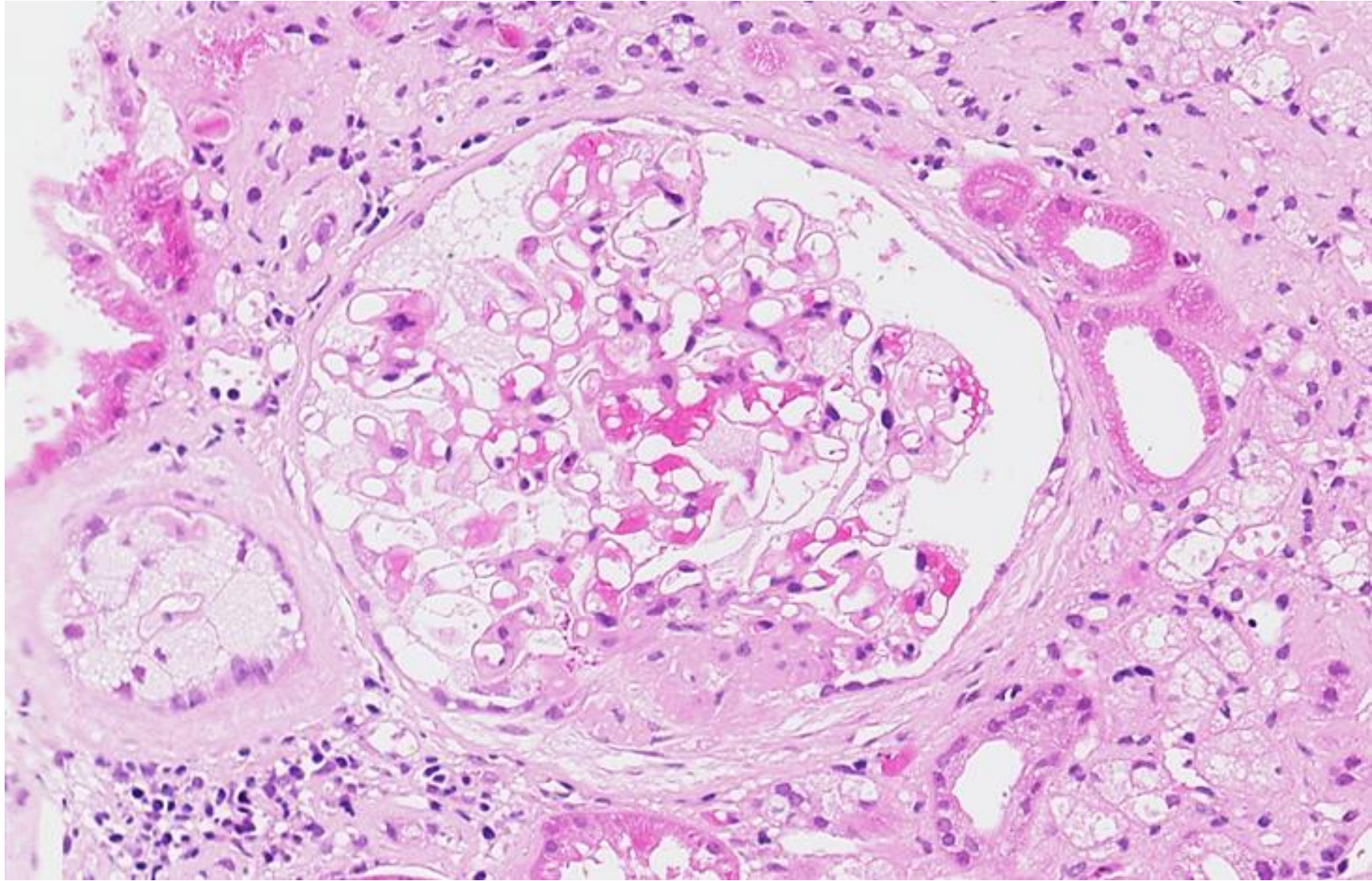
Macroscopic: 1 core measuring 11mm plus fat measuring up to 2mm. Gloms seen. EM taken.

Immunohistochemistry: IF: IgA, IgG, IgM, C3, Kappa, lambda and C1q are negative.

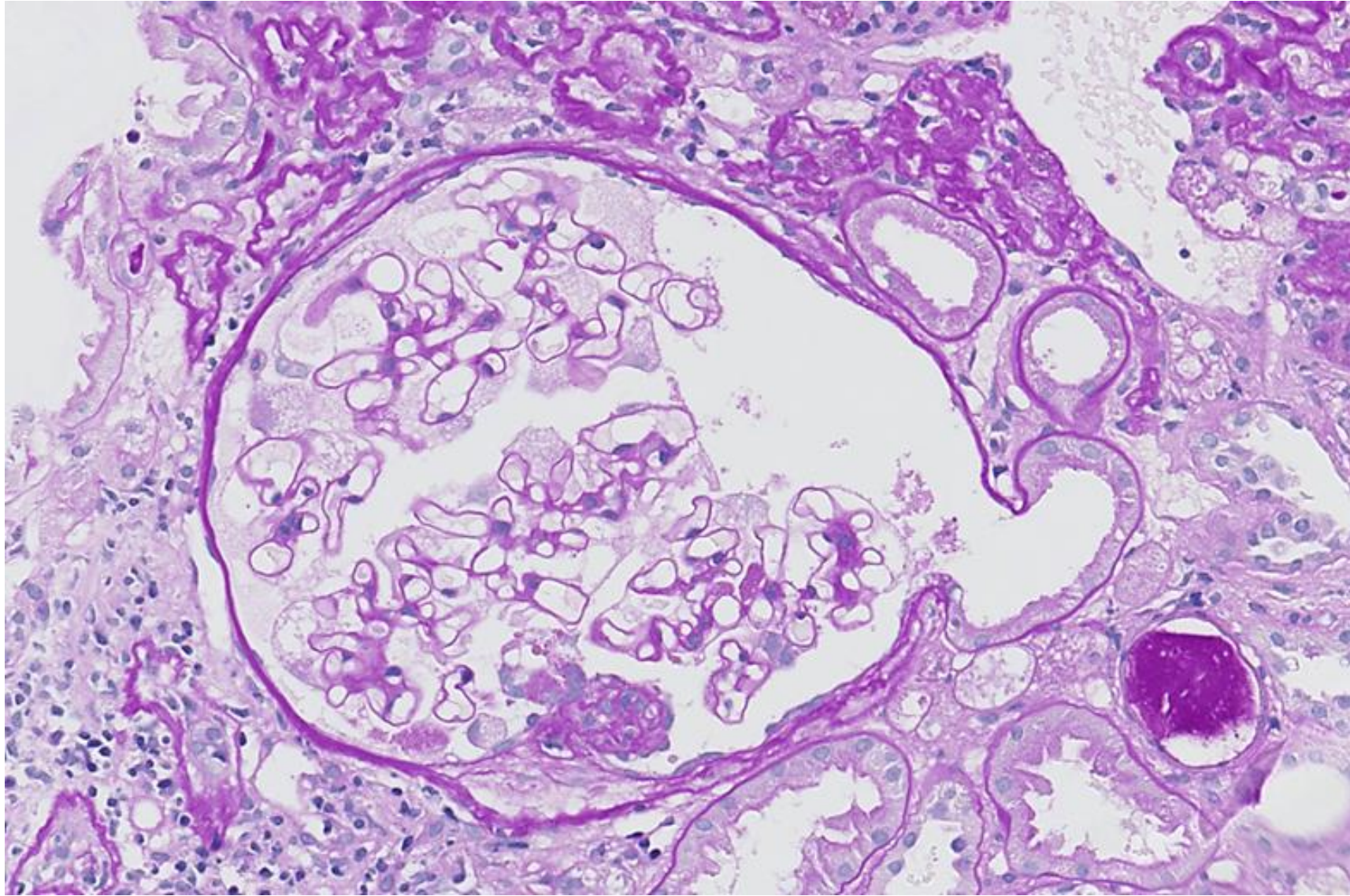
Z2



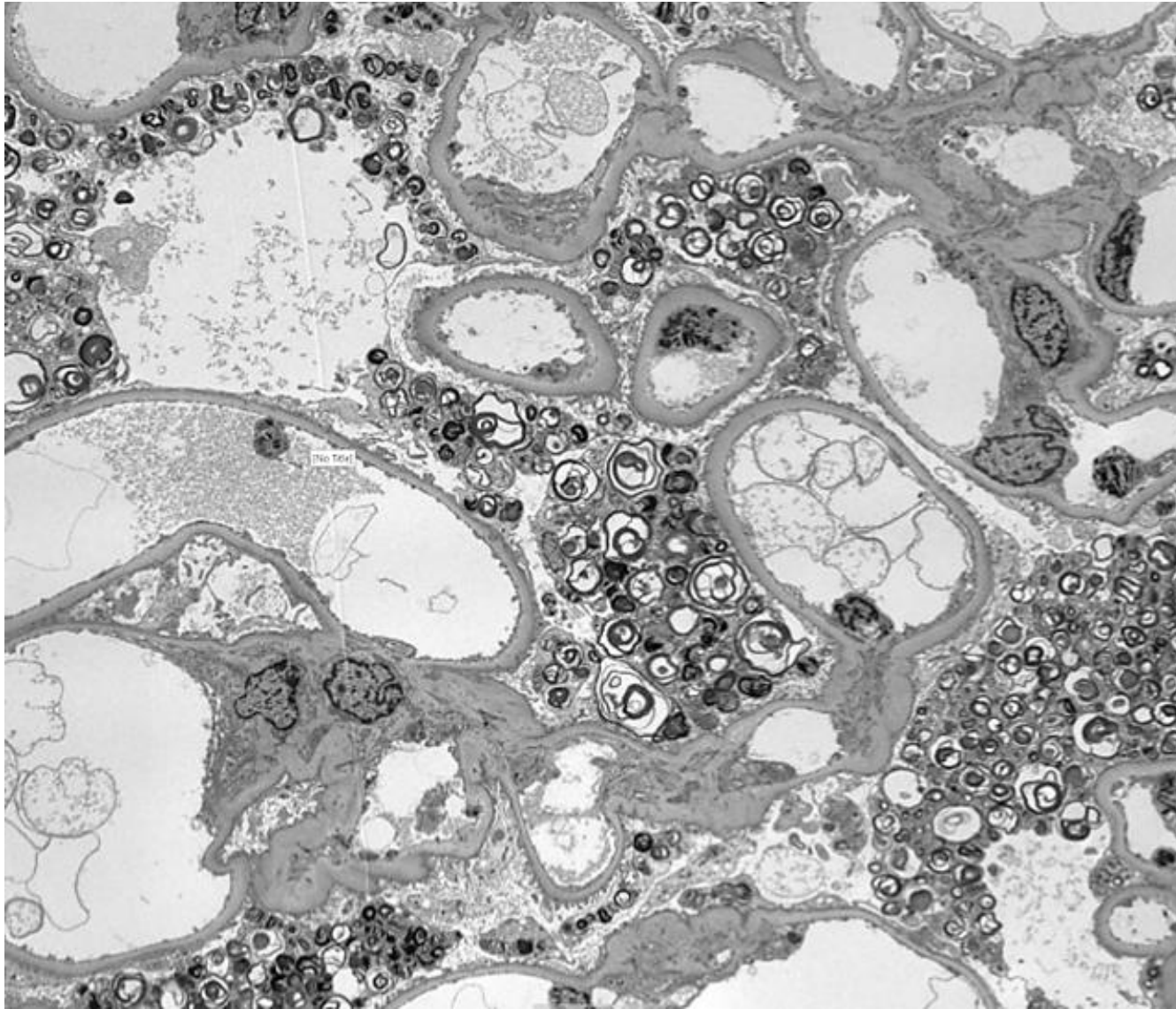
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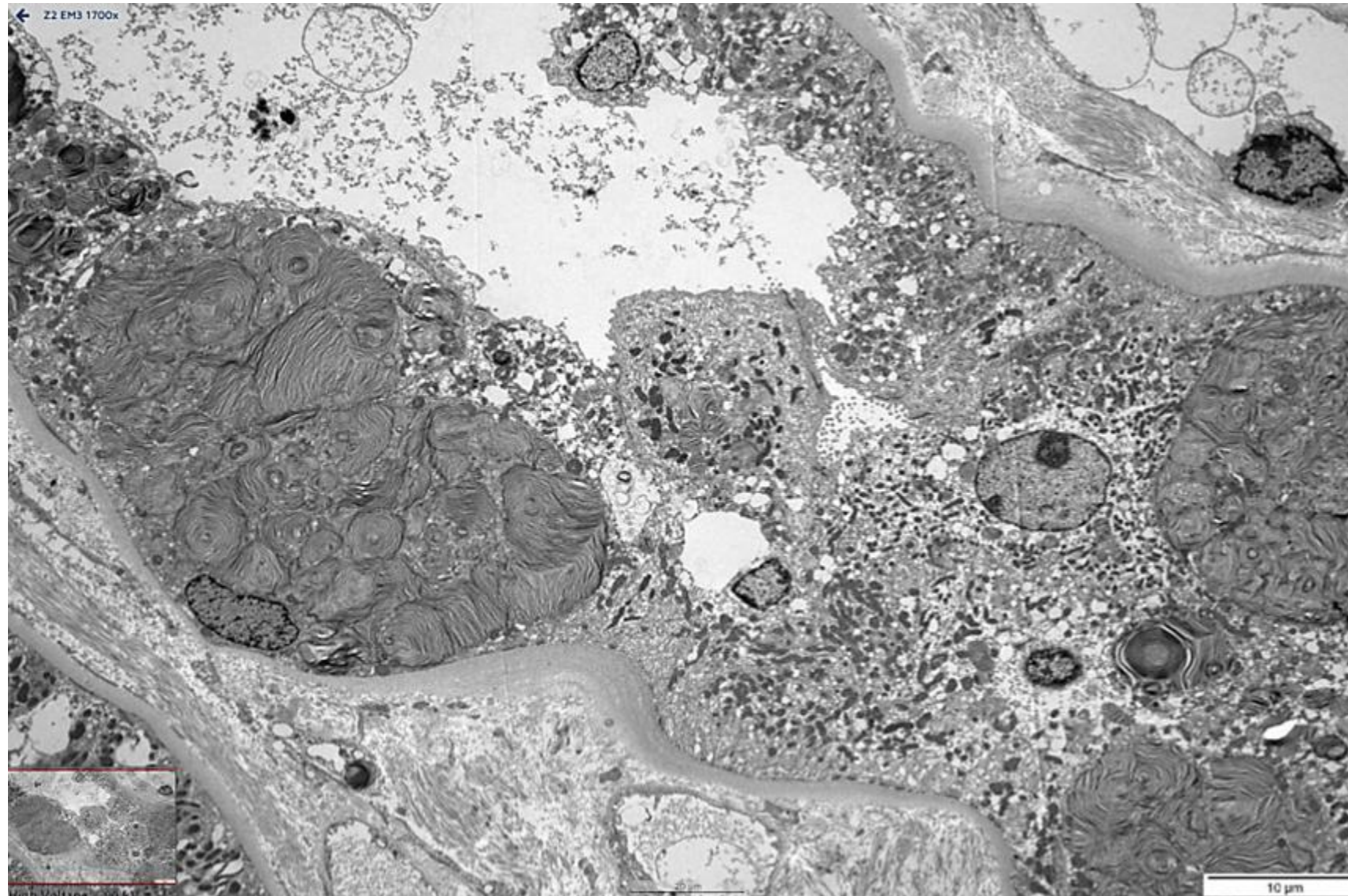
Z2



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Specimen: Renal biopsy core

Macroscopic: 1 core measuring 11mm plus fat measuring up to 2mm. Gloms seen. EM taken.

Immunohistochemistry: IF: IgA, IgG, IgM, C3, Kappa, lambda and C1q are negative.

Original Diagnosis: Fabry's disease.

	Diagnostic categories:	Popularity:
1	Fabry's disease	100.0%

Secondary diagnoses:

	Diagnostic categories:	Popularity:
1	Focal segmental glomerulosclerosis secondary (perihilar)	1.3% (1)
2	Focal segmental glomerulosclerosis collapsing glomerulopathy	1.3% (1)
3	NONE	97.4% (75)

Case Number: Z1

Number of responses: 77. Date of analysis: 24 May 2023

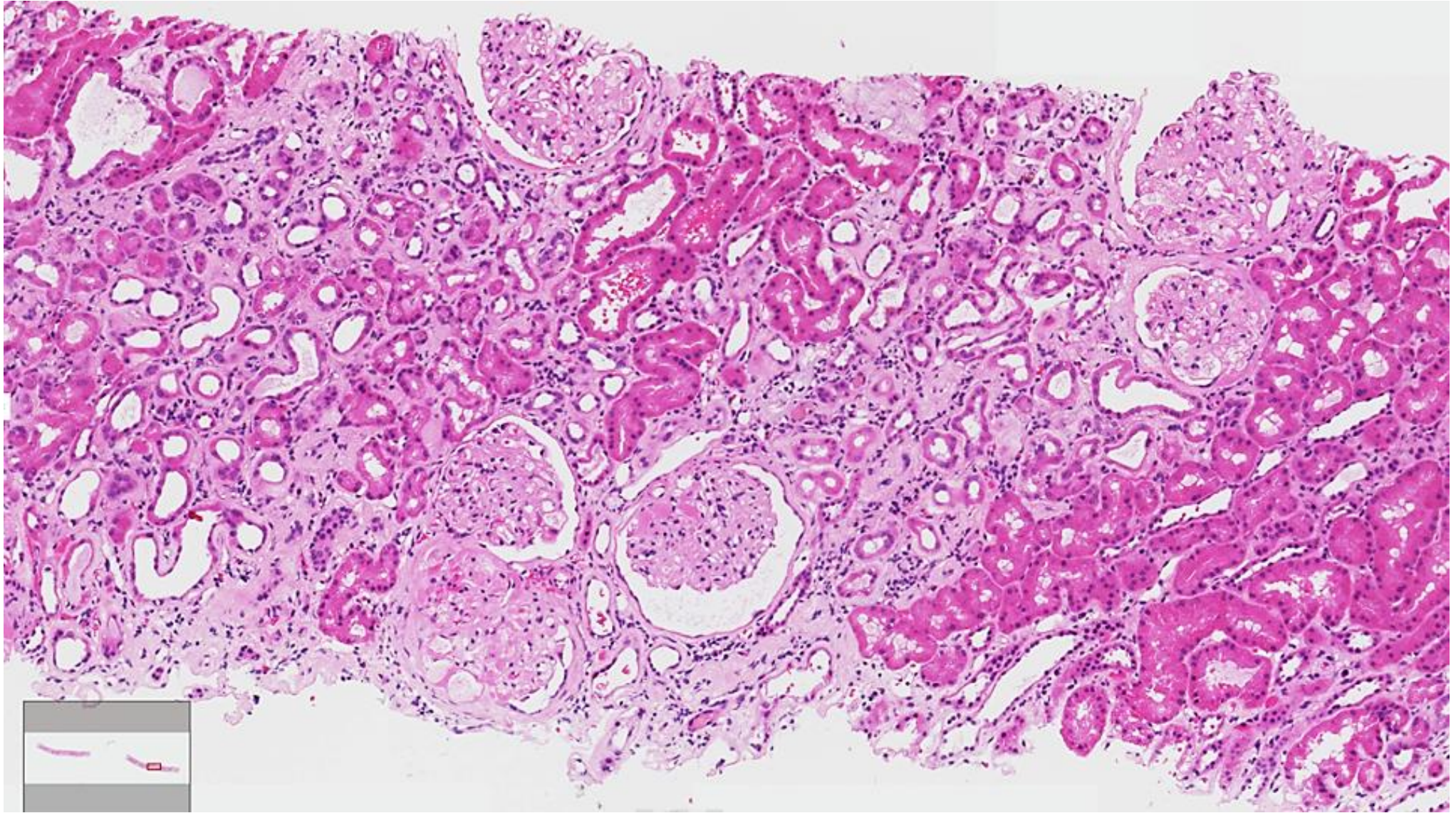
Clinical: Male 22. Nephrotic + mildly impaired function. Cr 130. Nephrotic screen pending. Sister diagnosed with membranous GN.

Specimen: Renal biopsy core

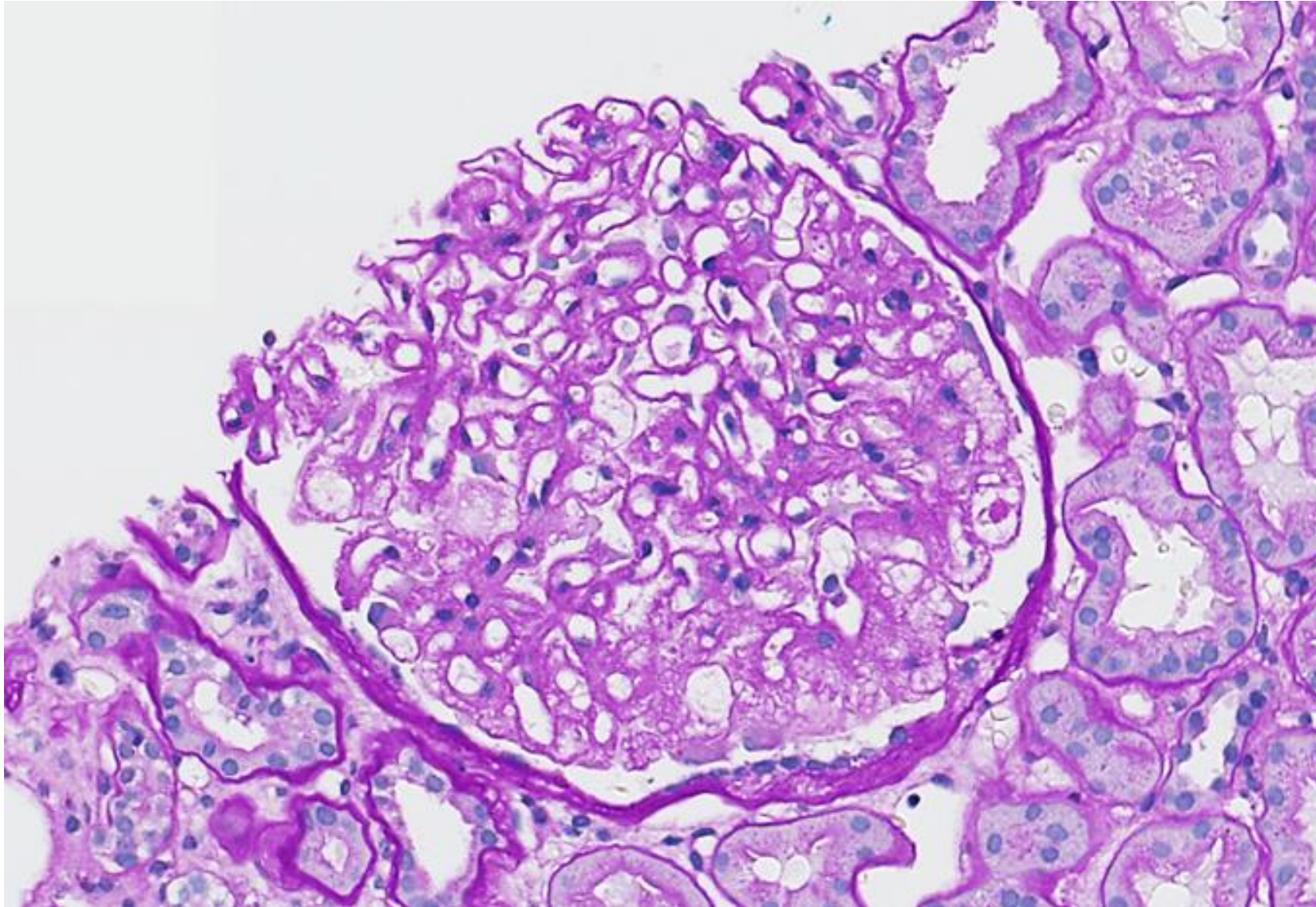
Macroscopic: 1 core, 14 mm. ? Gloms seen. EM taken.

Immunohistochemistry: IH: IgA, IgG and C3 are negative.

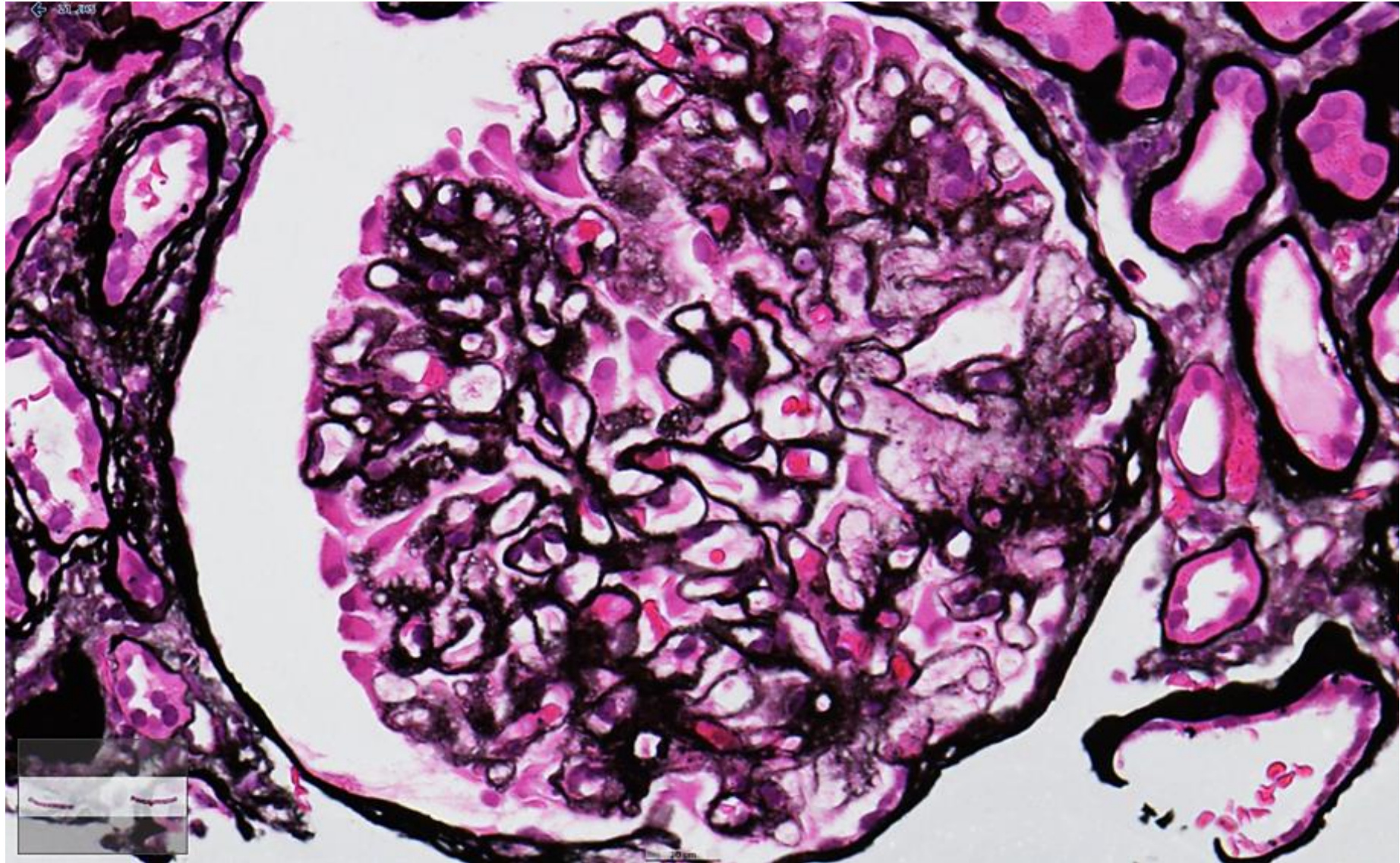
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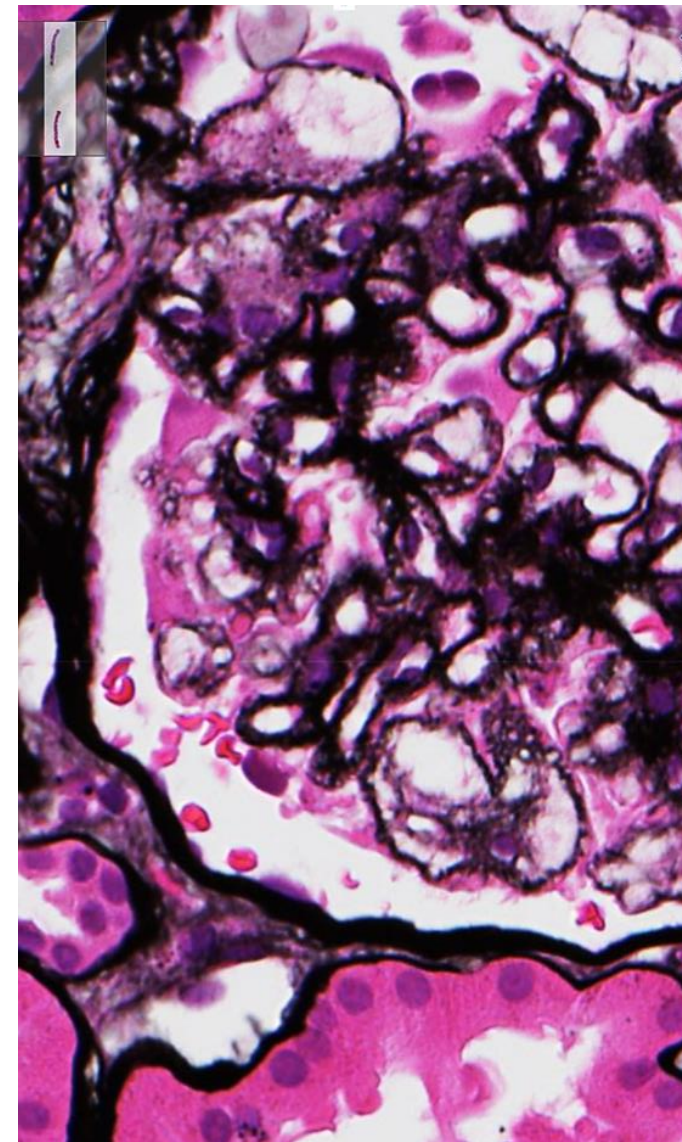
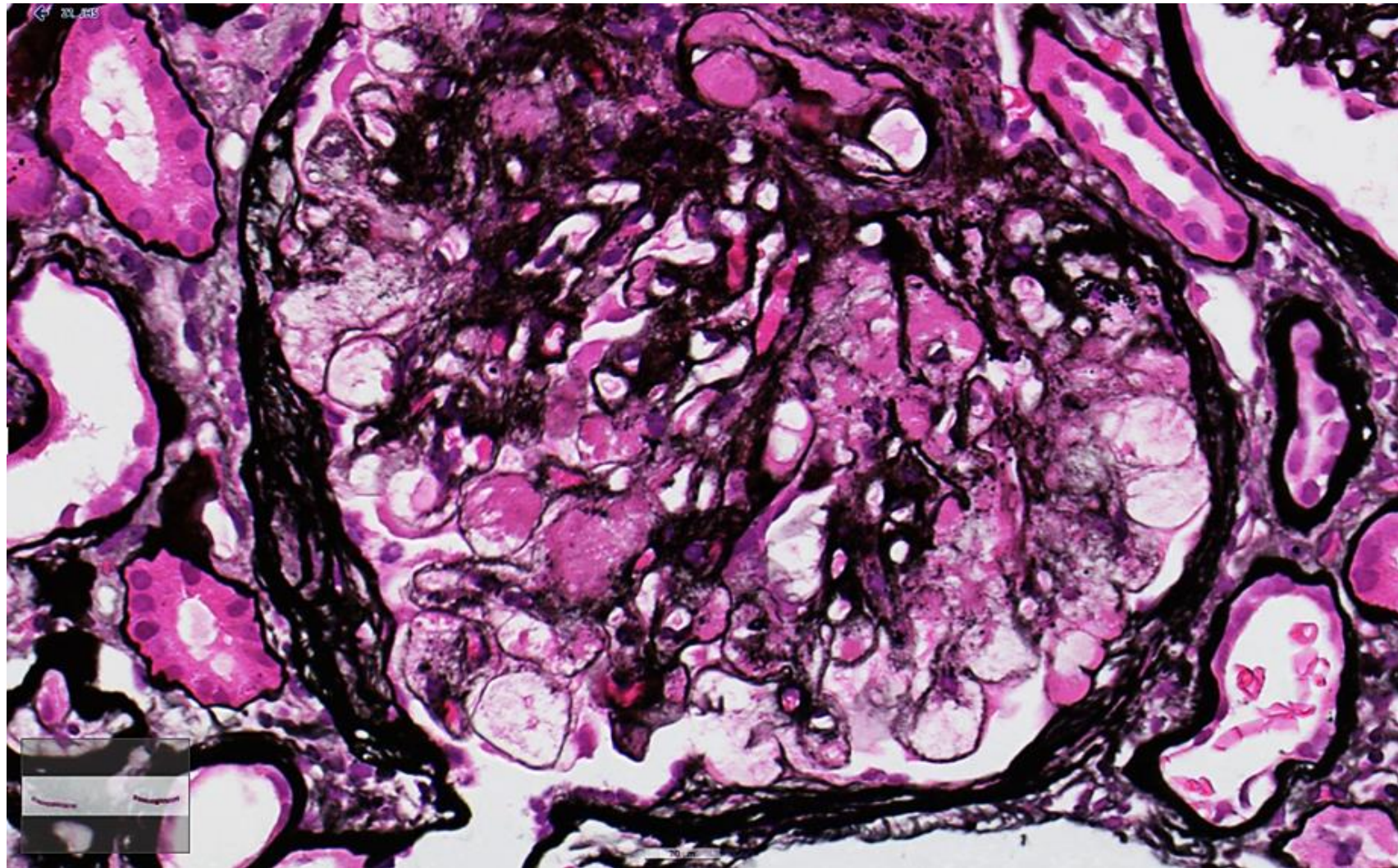
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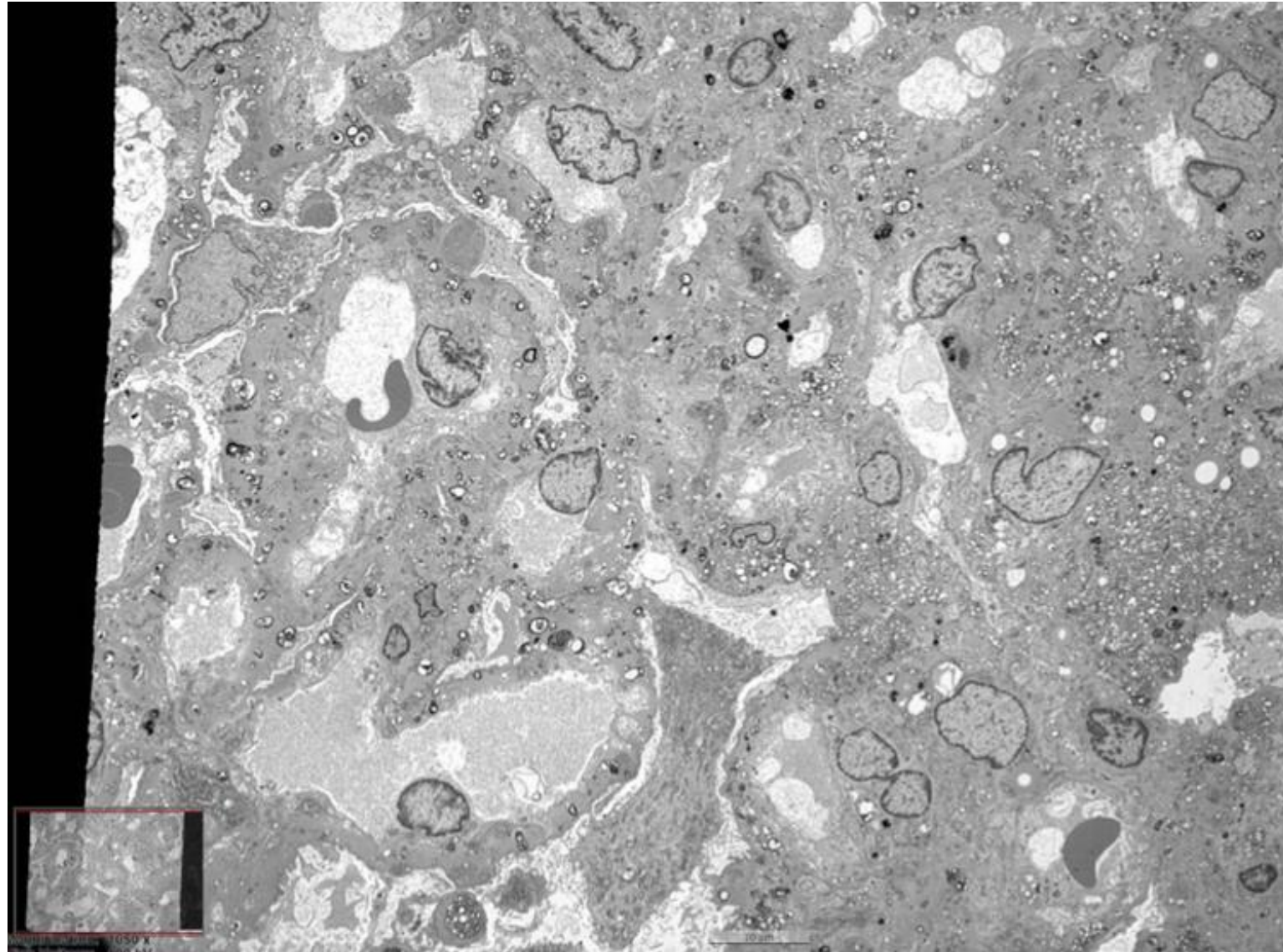
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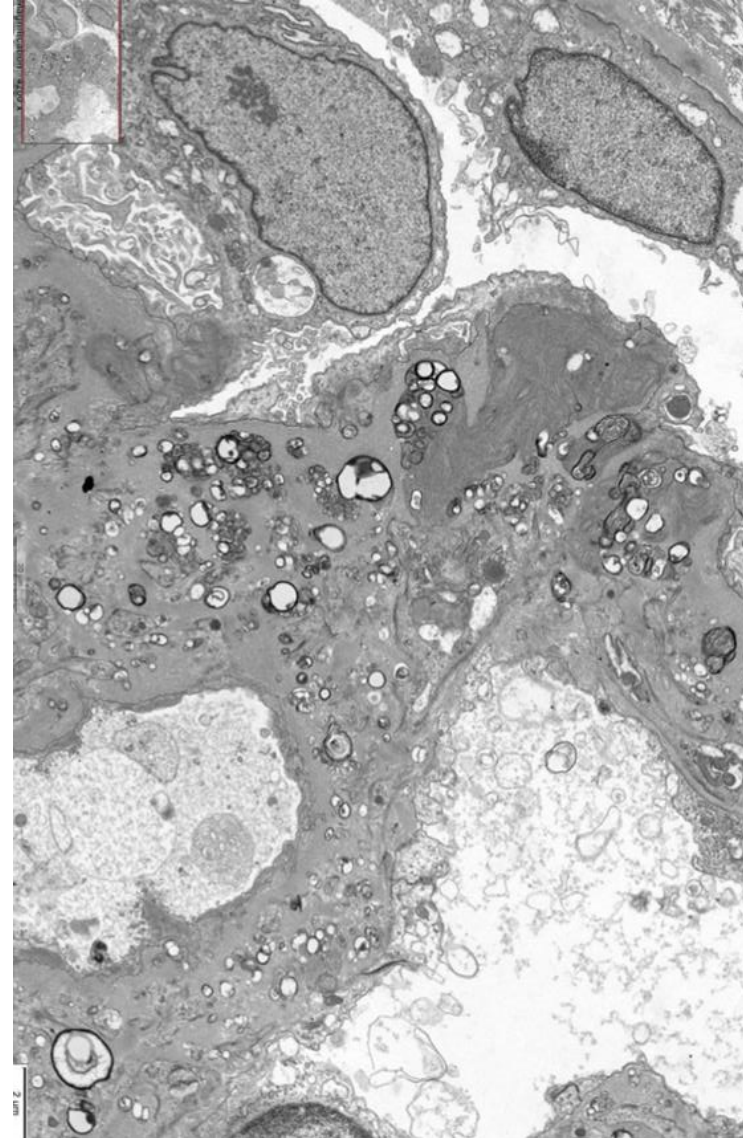
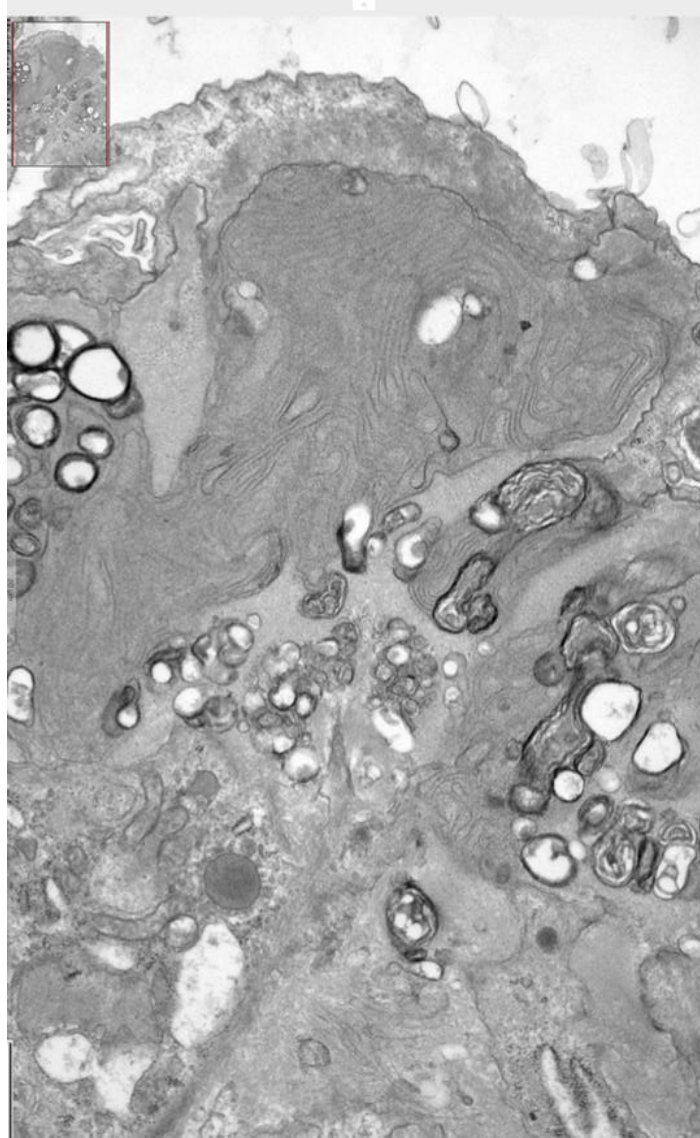
Z1



Z1



Z1



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Specimen: Renal biopsy core

Macroscopic: 1 core, 14 mm. ? Gloms seen. EM taken.

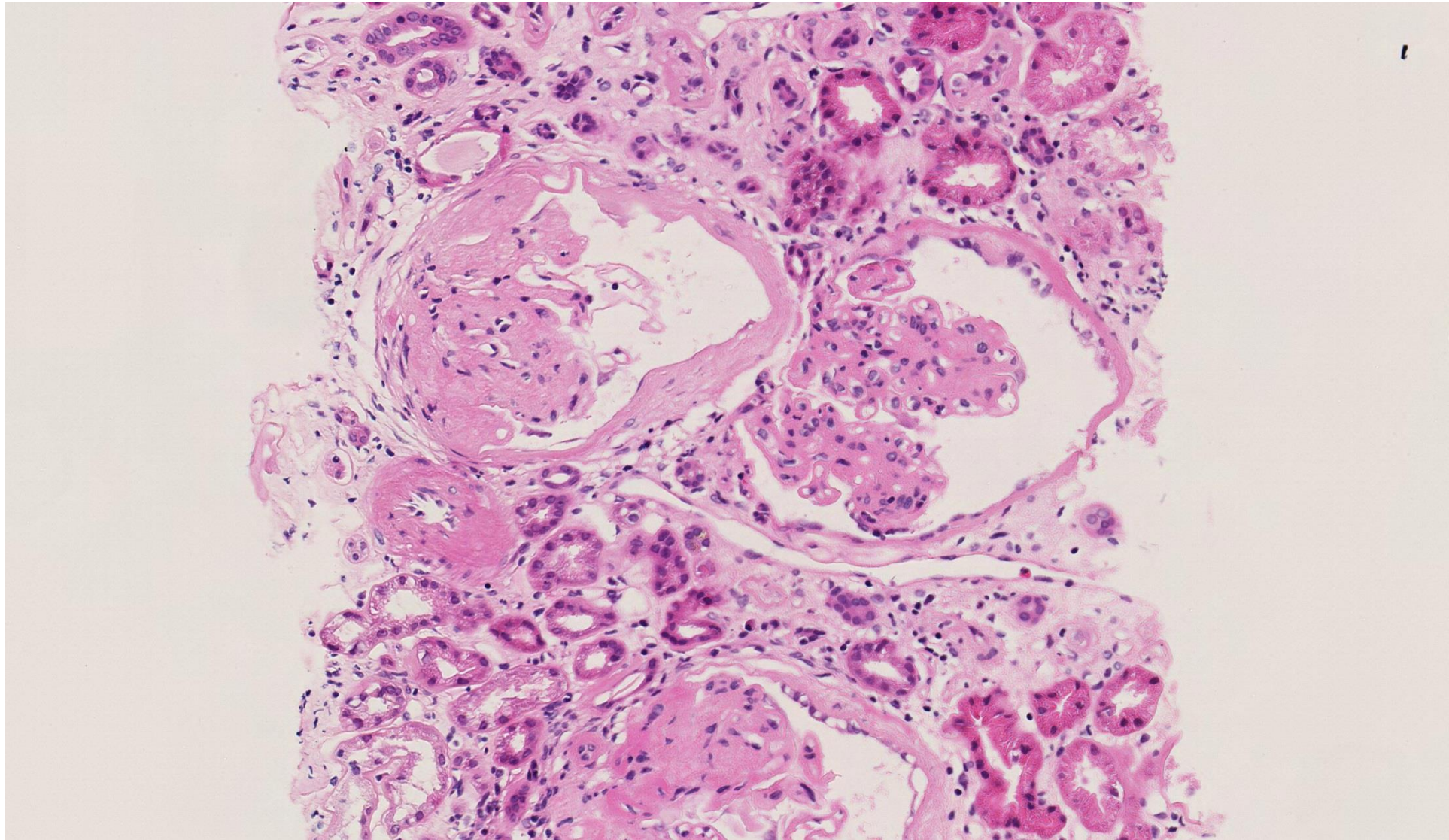
Immunohistochemistry: IH: IgA, IgG and C3 are negative.

Original Diagnosis: IN KEEPING WITH LCAT DEFICIENCY

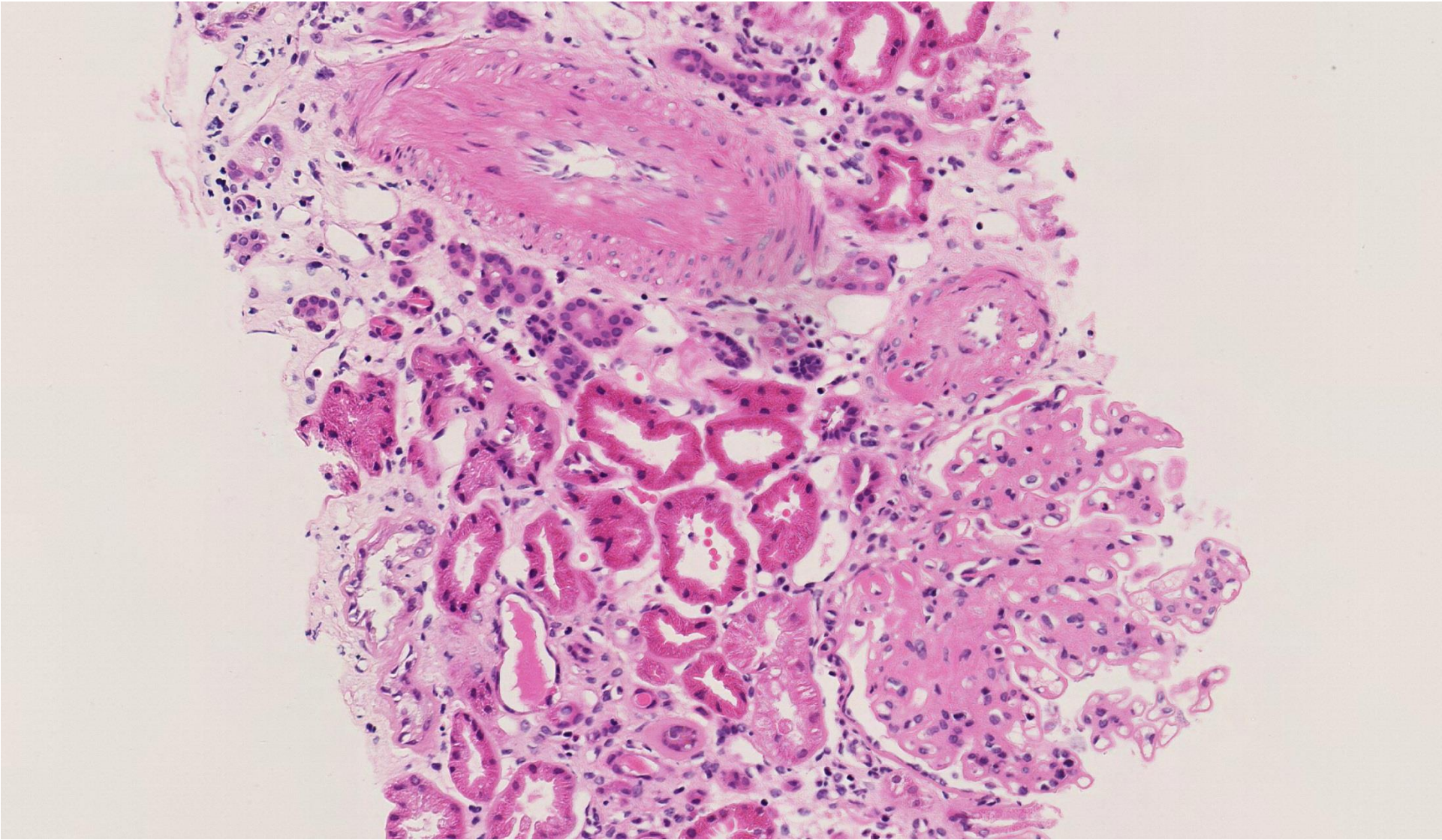
	Diagnostic categories:	Popularity:
1	LCAT deficiency	85.5%
2	Fabry's disease	10.5%
3	Membranous glomerulonephritis	2.6%
4	Cryoglobulinaemic glomerulonephritis	1.3%

Case number:	V9
Clinical Information:	Normal sized kidneys and 3.5g proteinuria in 24h. Negative autoimmune screen. Cr 157. Hypertension. ? Chronic GN
Specimen:	Native renal biopsy
Age:	54
Sex:	Male
Macroscopic description:	-
Immunohistochemistry:	IF: Weak segmental positivity for C3. Rest (IgG, IgA, IgM, C1q, kappa, lambda) negative.

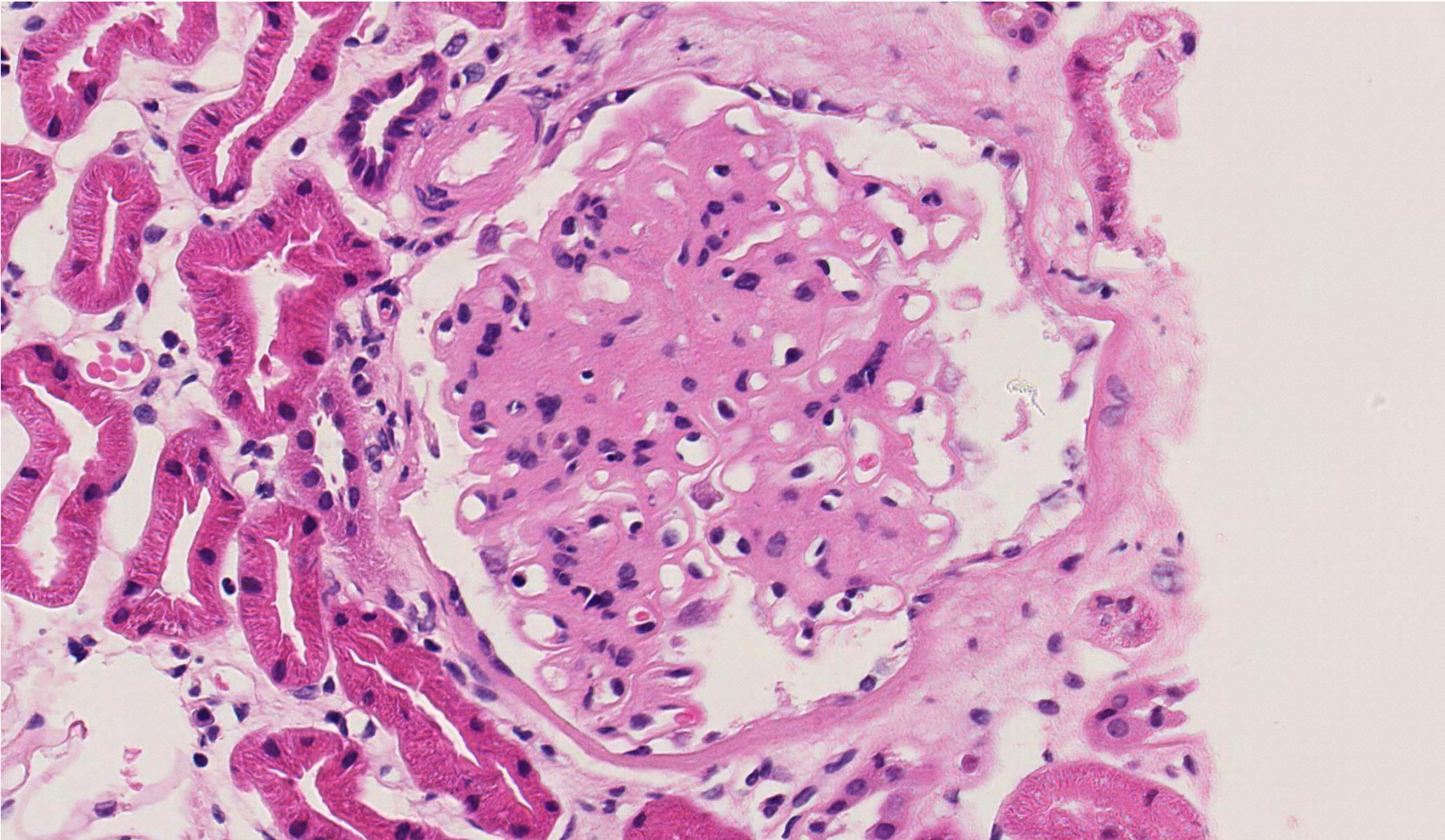
Case 9



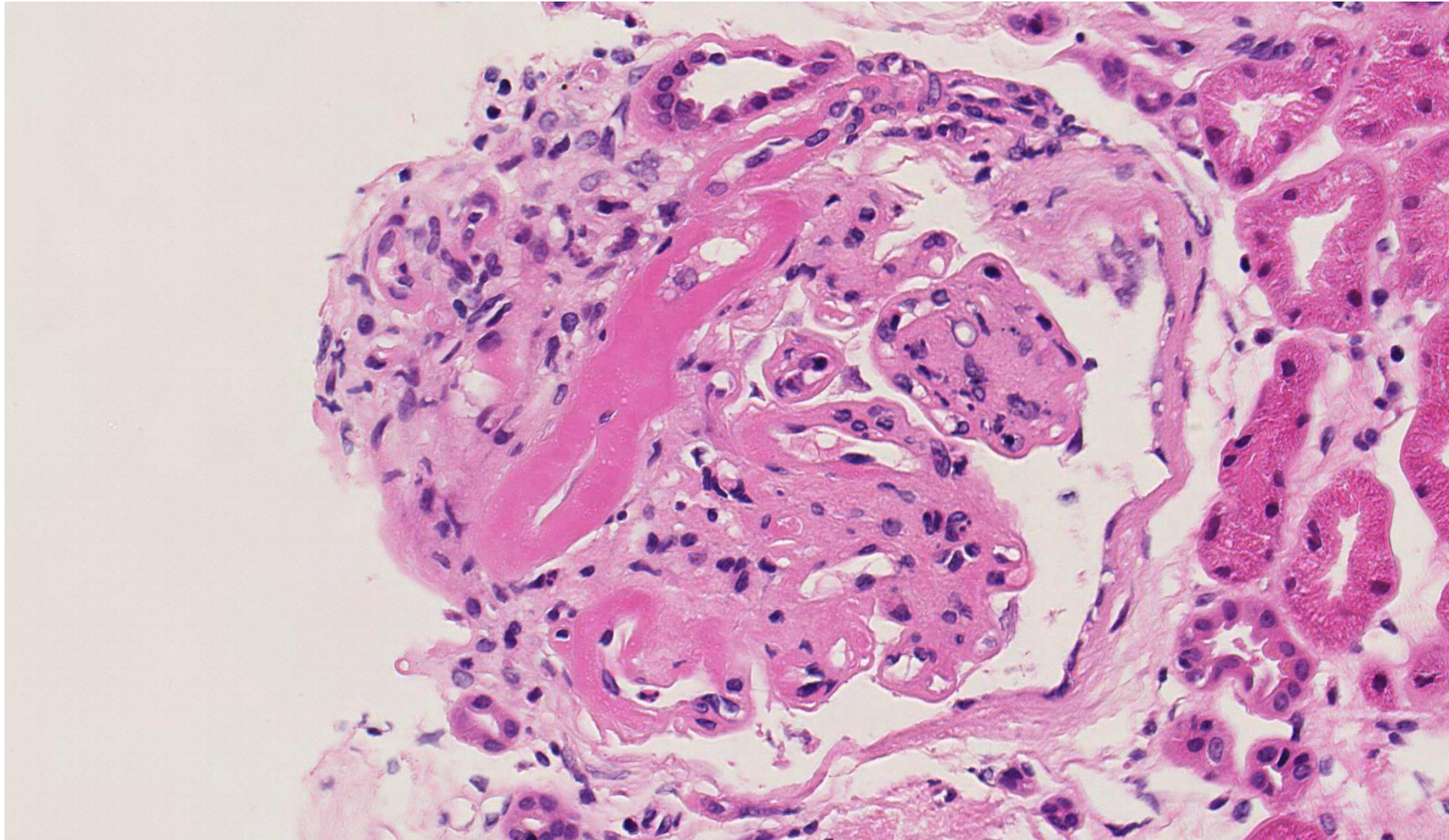
Case 9



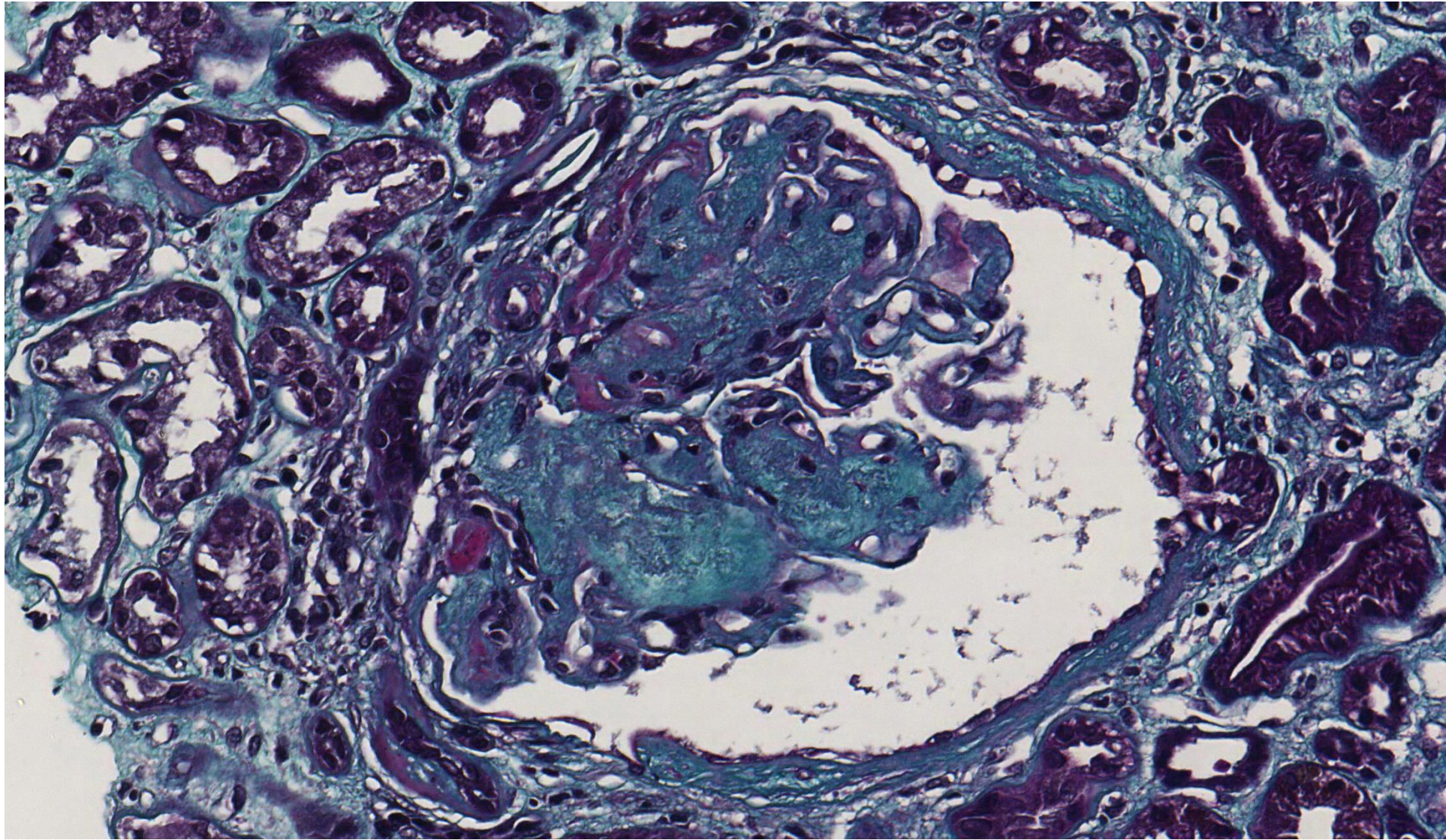
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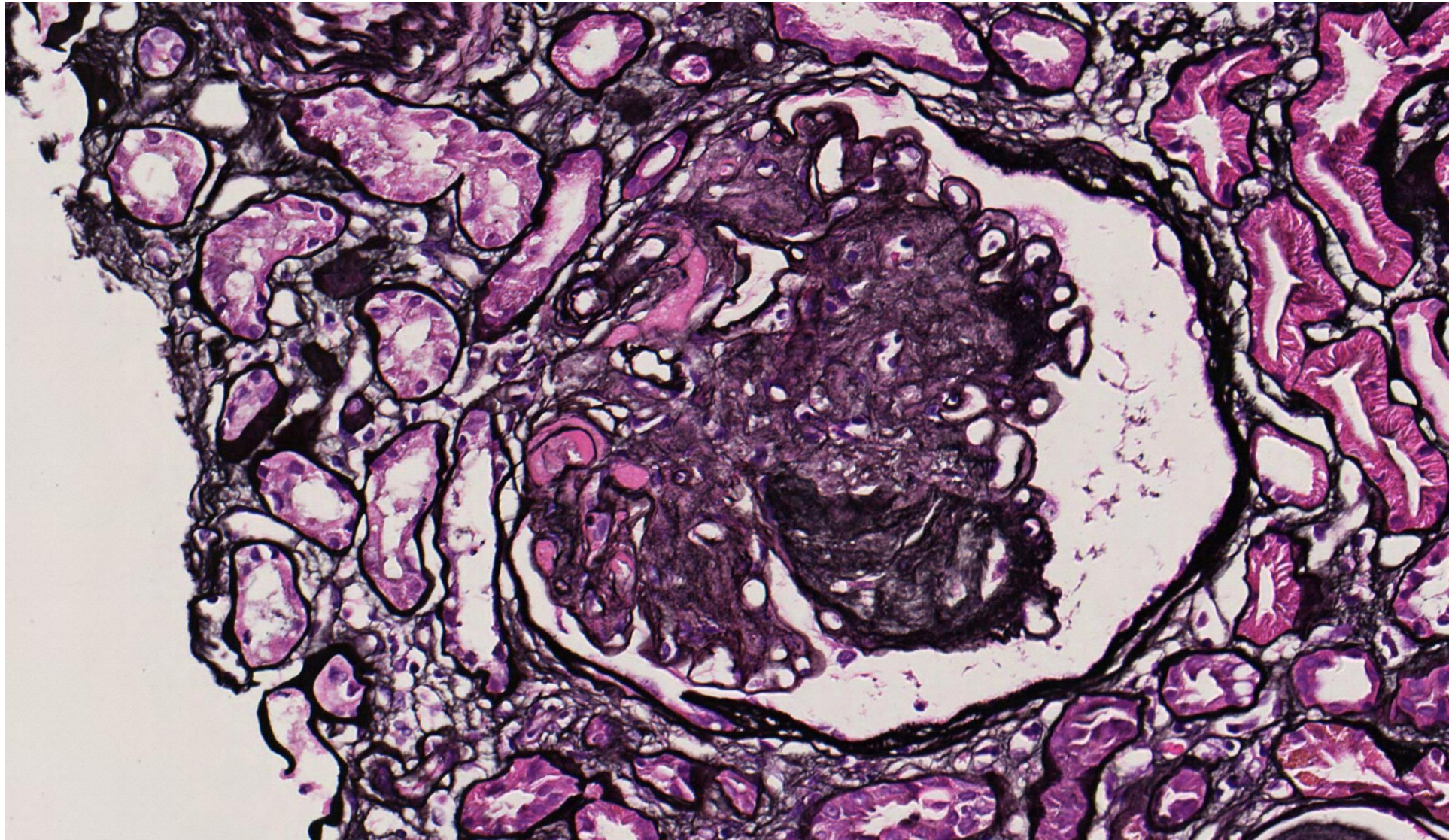
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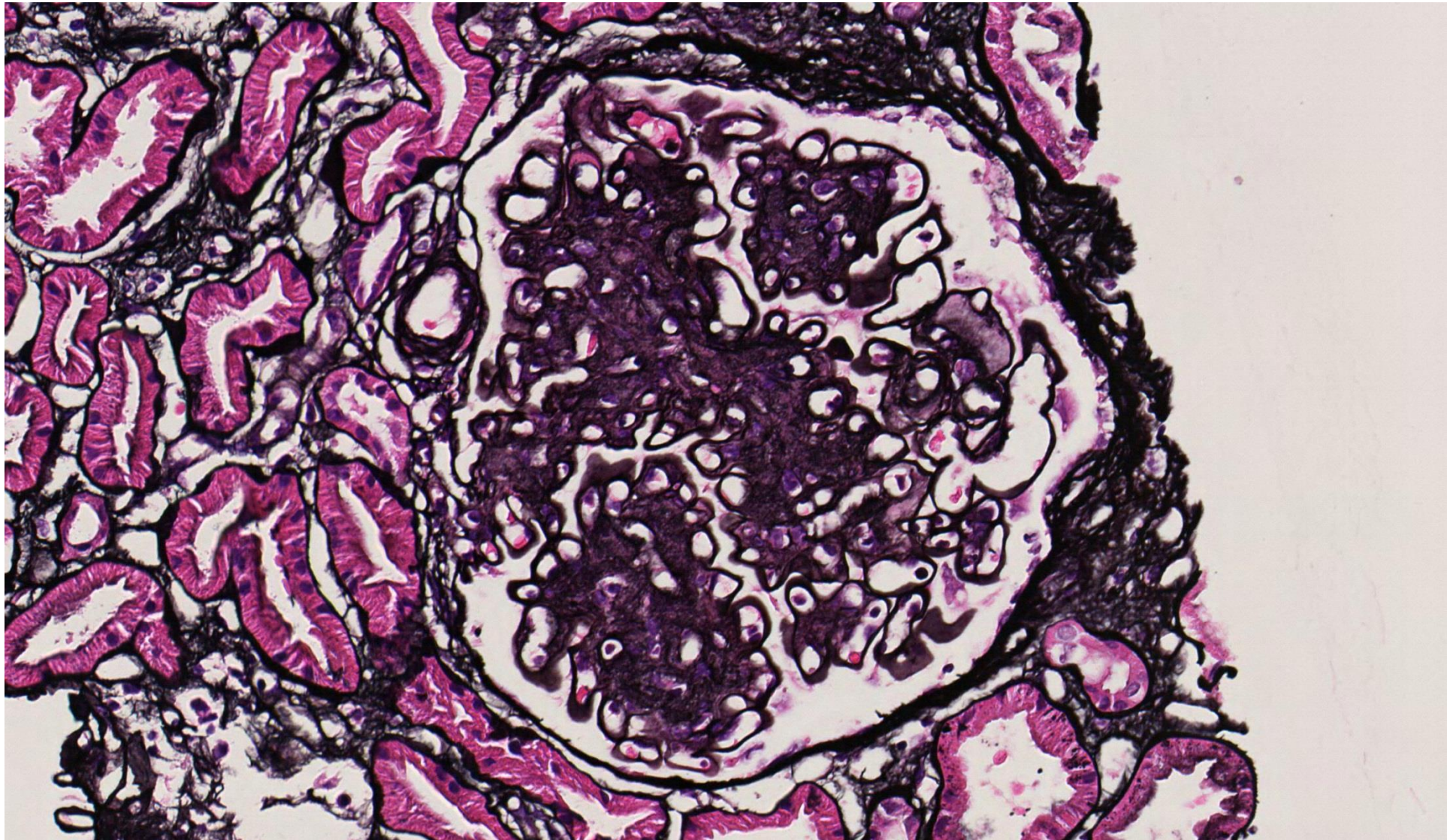
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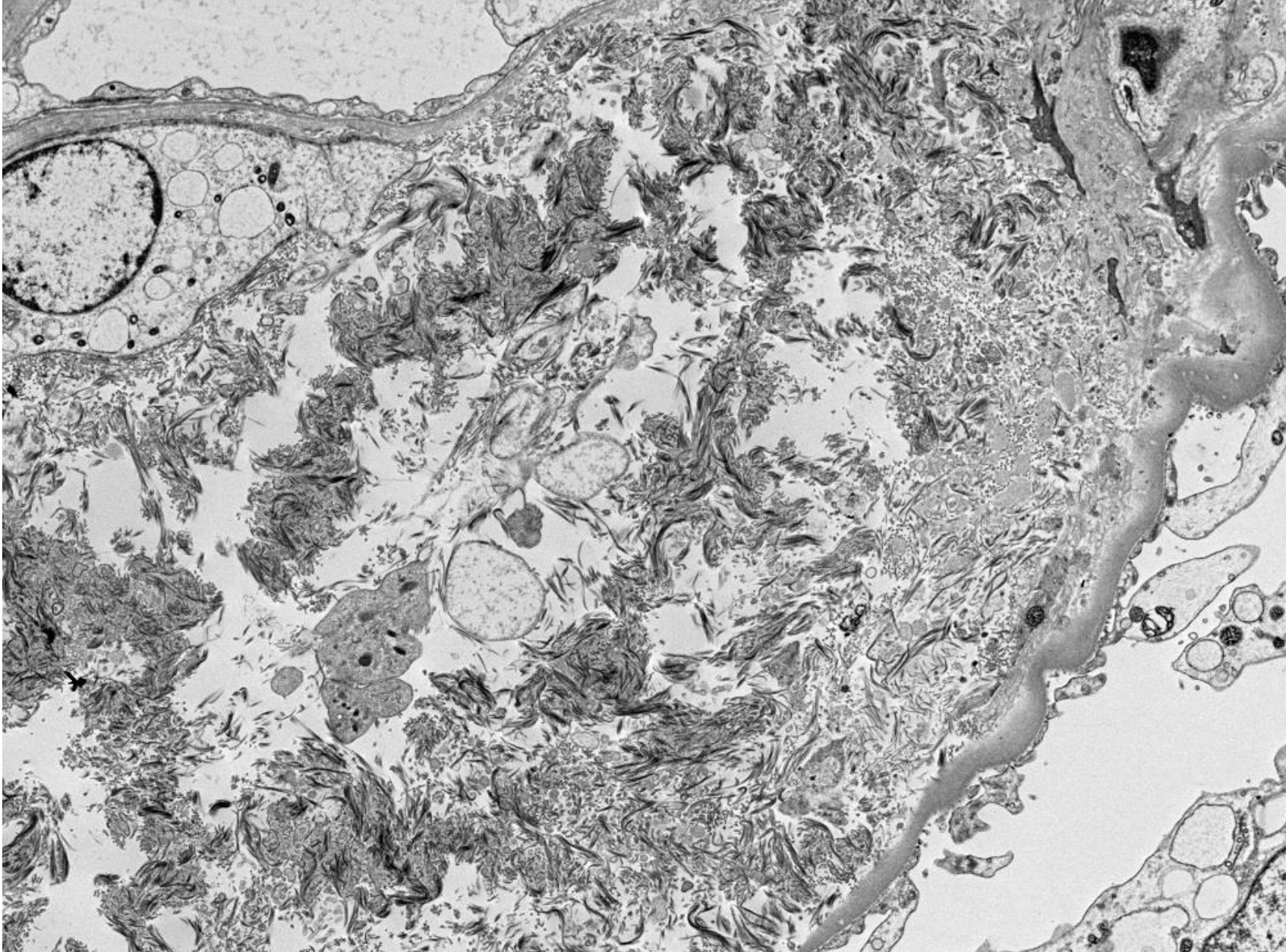
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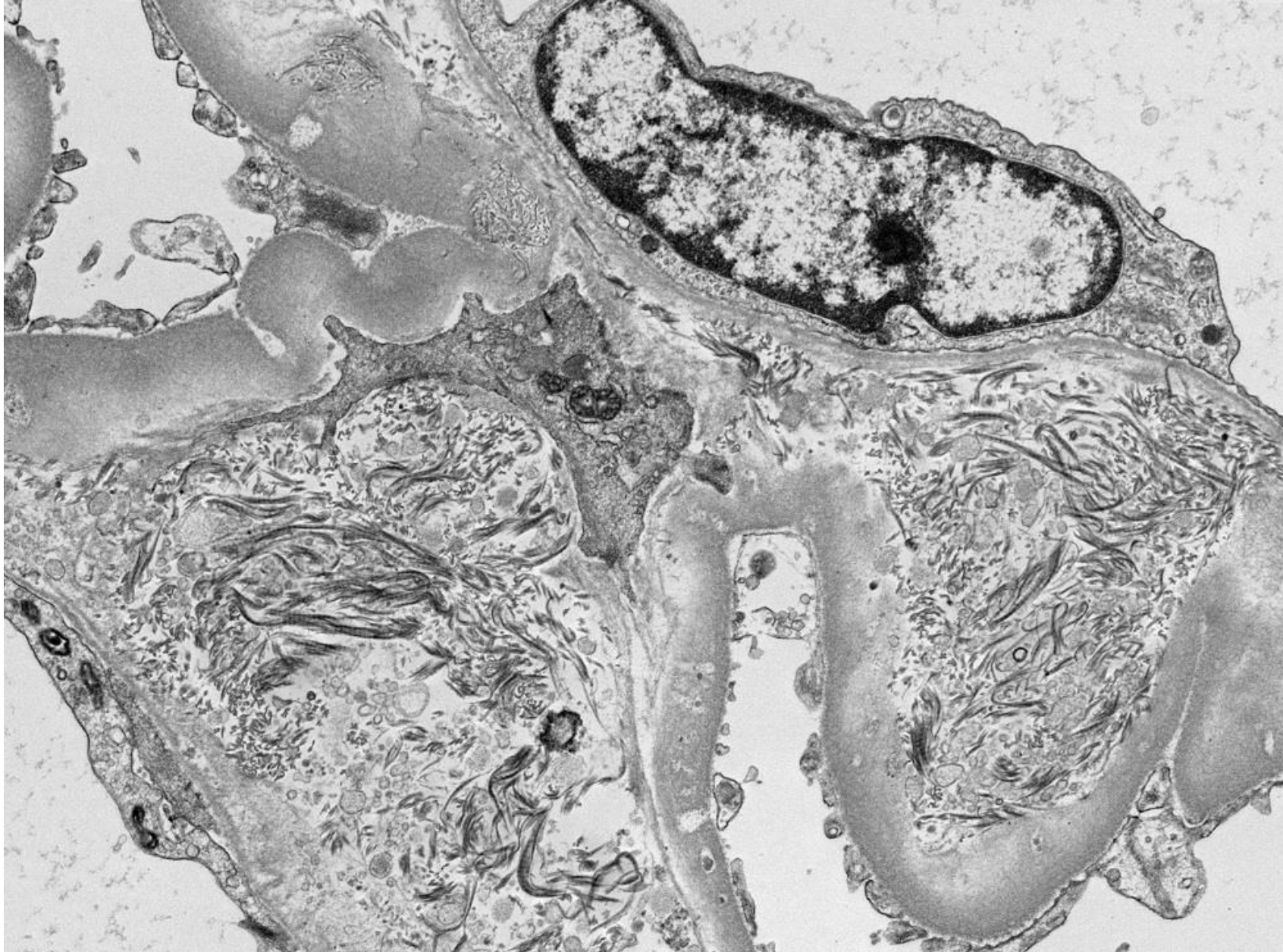
Case 9



Case 9



Case 9



Case 9



Case 9

Diagnostic categories:

- 1 Collagenofibrotic glomerulopathy
- 2 Fibrillary glomerulonephritis
- 3 Immunotactoid glomerulonephritis
- 4 Nodular glomerulosclerosis not otherwise specified
- 5 Thrombotic microangiopathy not otherwise specified
- 6 Thrombotic microangiopathy, chronic
- 7 Diabetic nephropathy

Popularity:

- 85.1%
- 6.6%
- 2.6%
- 1.7%
- 1.3%
- 1.3%
- 1.3%

Secondary diagnoses:

Diagnostic categories:

- 1 Arteriosclerosis/arterial fibroelastosis (chronic hypertensive vascular disease)
- 2 NONE

Popularity:

- 5.3% (4)
- 94.7% (72)

Original Diagnosis: Glomerular deposition disease. EM shows collagenofibrotic GN.

