



# Pathology of Renal Transplantation

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# Objectives:

- ▶ Recognize the concept of renal allograft.
- ▶ Describe the pathology of rejection
- ▶ Differentiate between acute and chronic rejection.
- ▶ Recognize the principal infections inherent to renal transplantation.
- ▶ Recognize acute and chronic drug toxicity.

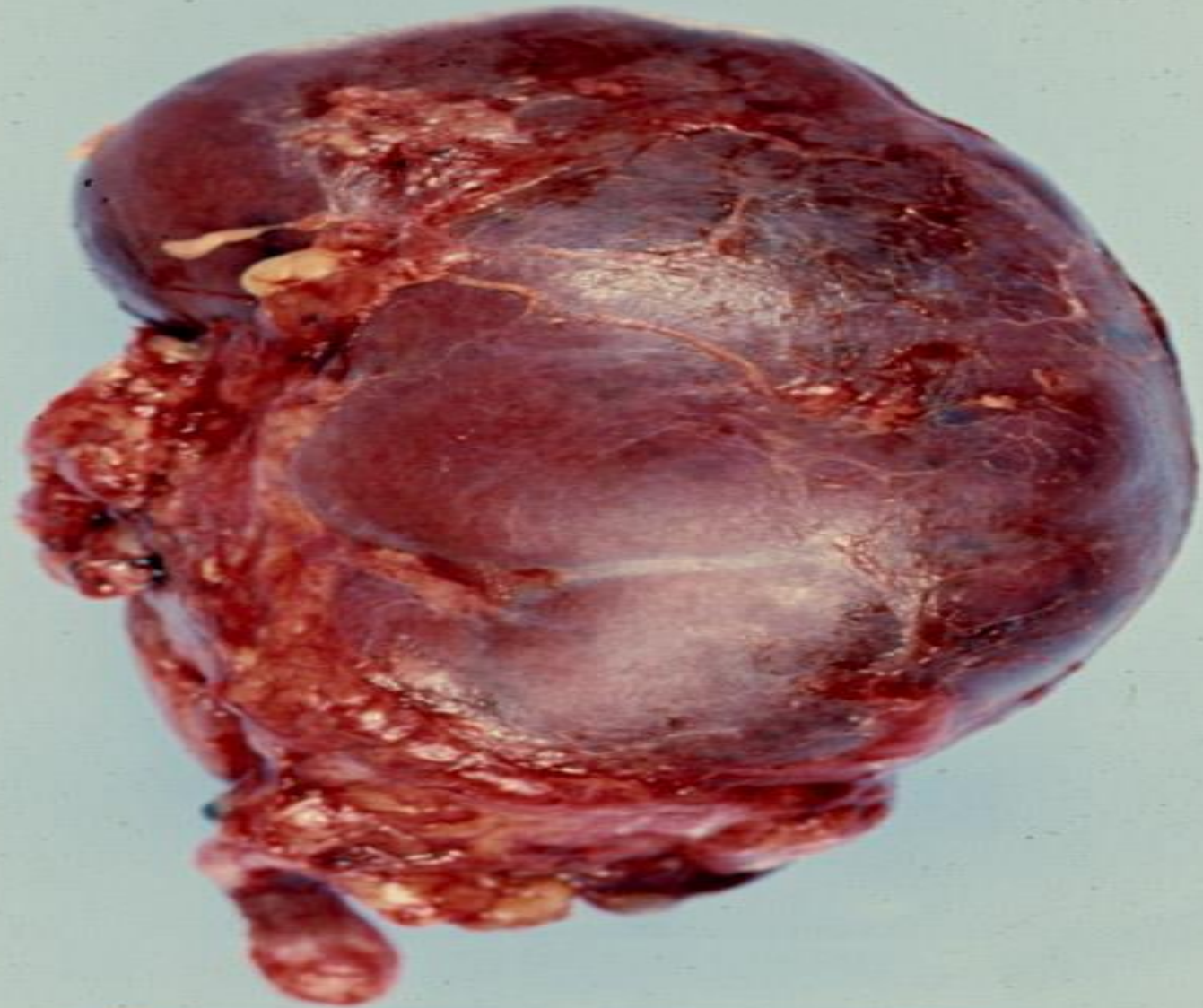


### **Renal transplantation**

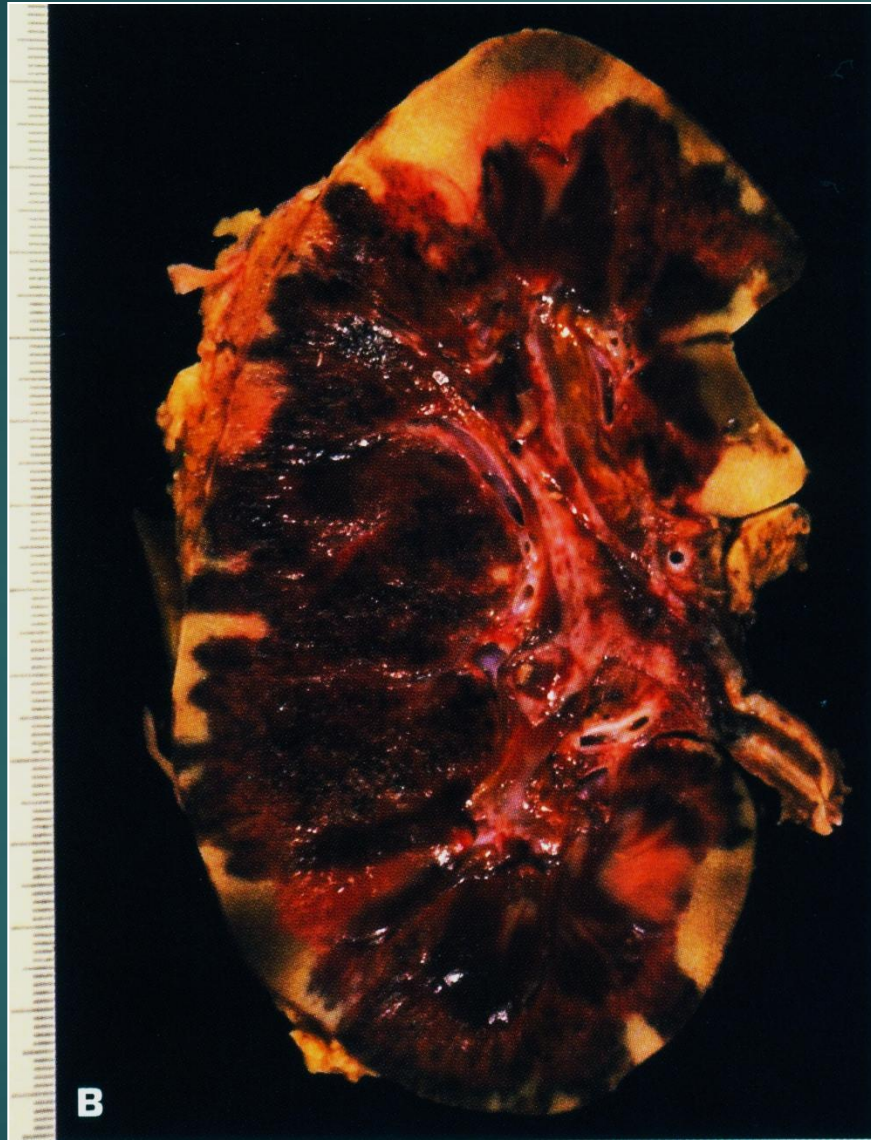
Note the two end-stage native kidneys in normal position, the atrophic first donor kidney (lower left), and the larger second donor kidney (lower right).

# The Banff classification: diagnostic categories

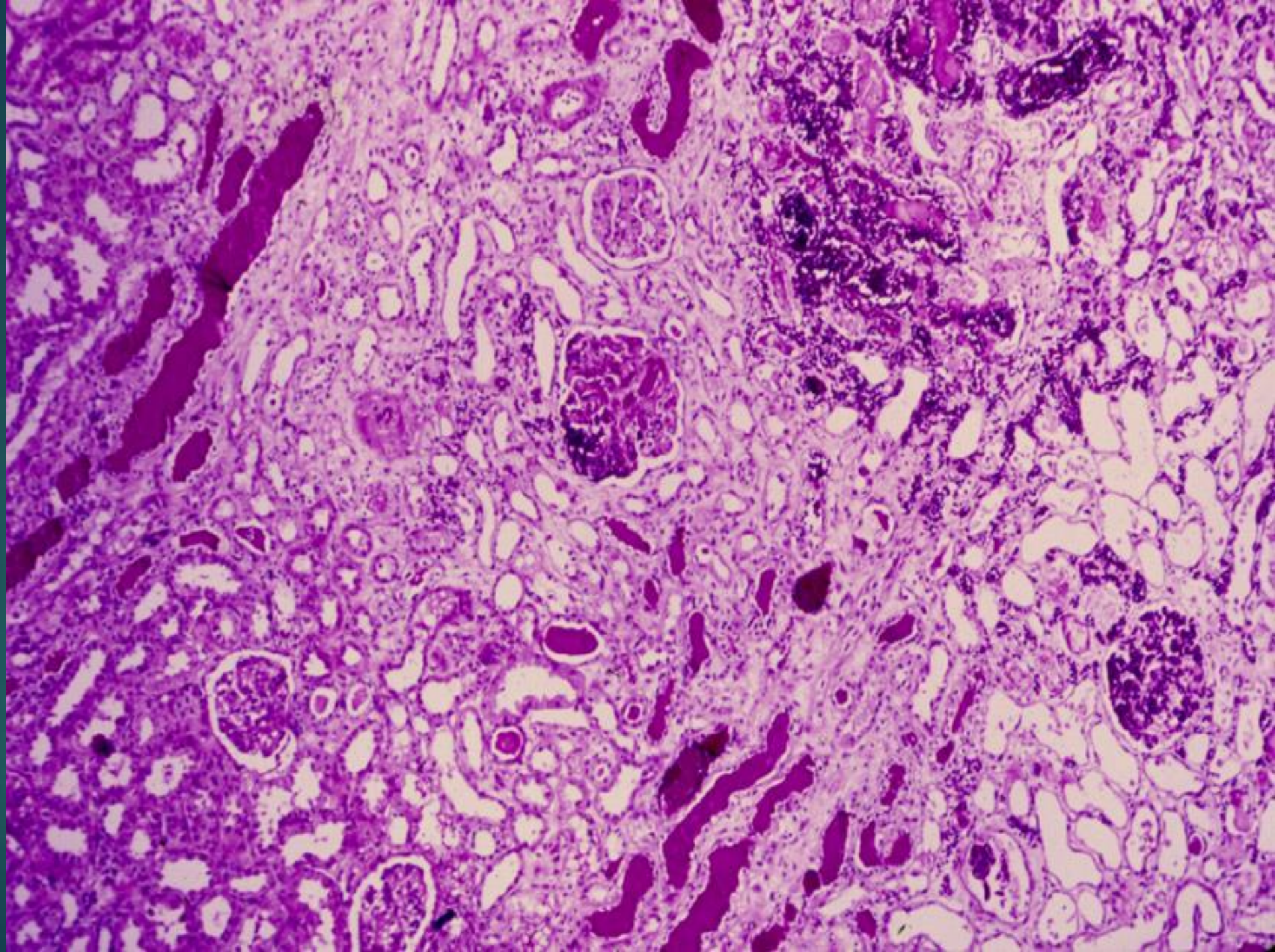
- ▶ Normal
- ▶ Hyperacute Rejection
- ▶ Borderline changes (“very mild acute rejection”)
- ▶ Acute Rejection( Tcell, Antibody-mediated)
- ▶ Chronic Rejection
- ▶ Others



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Subtotal renal infarction  
due to **hyperacute**  
**(antibody-mediated)**  
**rejection.**



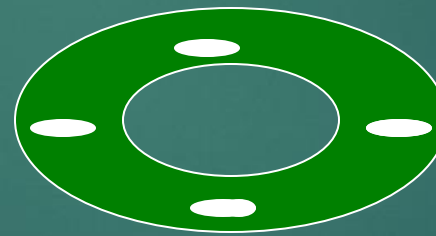
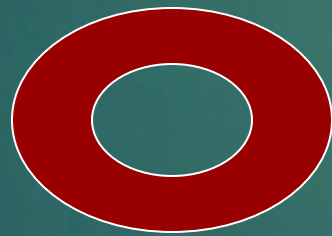


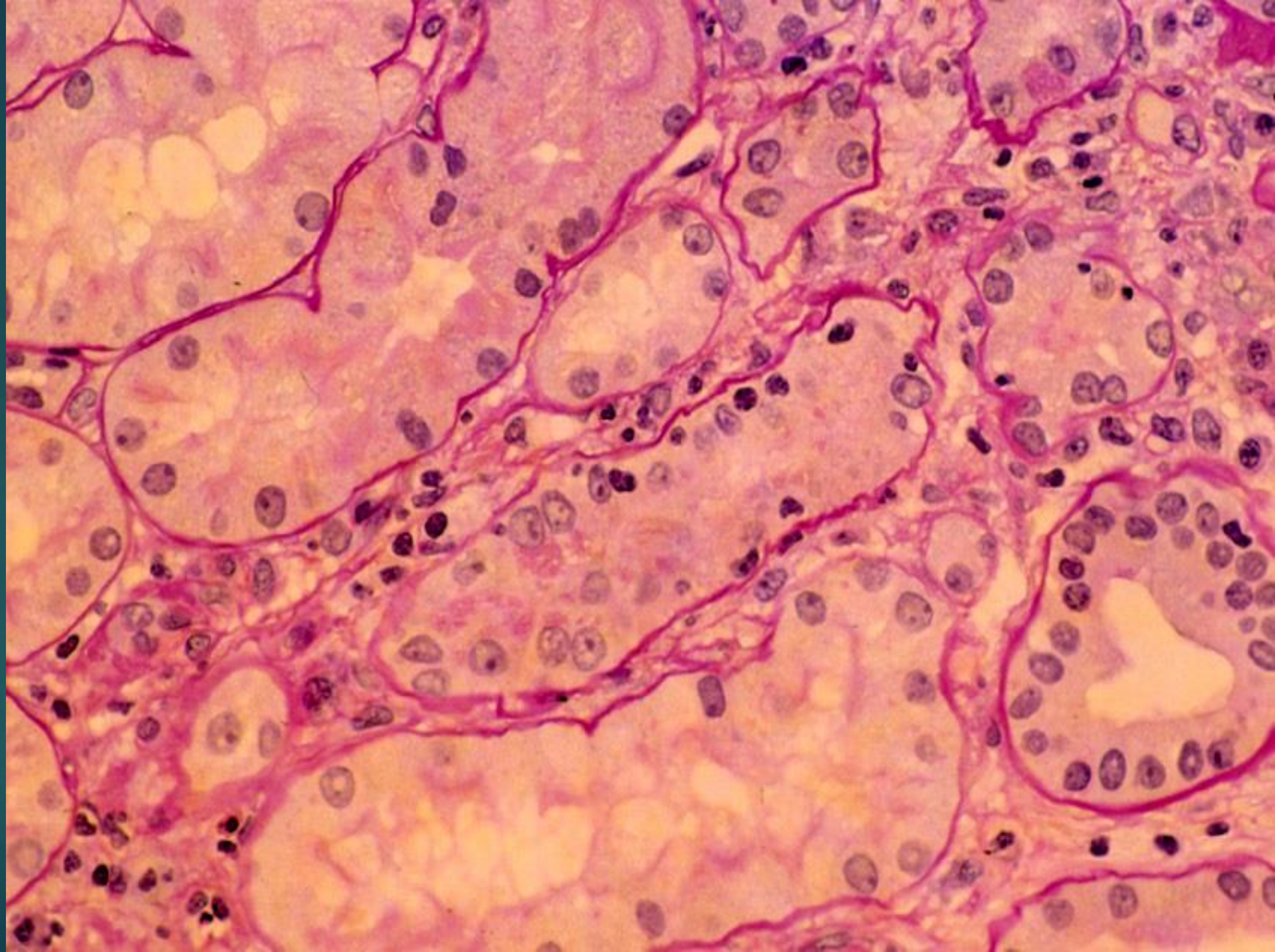
**Severe acute rejection of donor kidney.** Focal infarcts are present.



# The Banff classification

- ▶ Borderline changes (Suspicious for Acute Rejection)

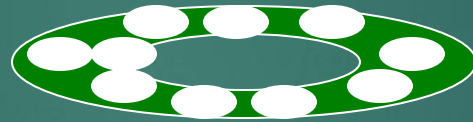




# The Banff classification

- ▶ Grade I A :→ Mononuclear interstitial inflammation (>25%).

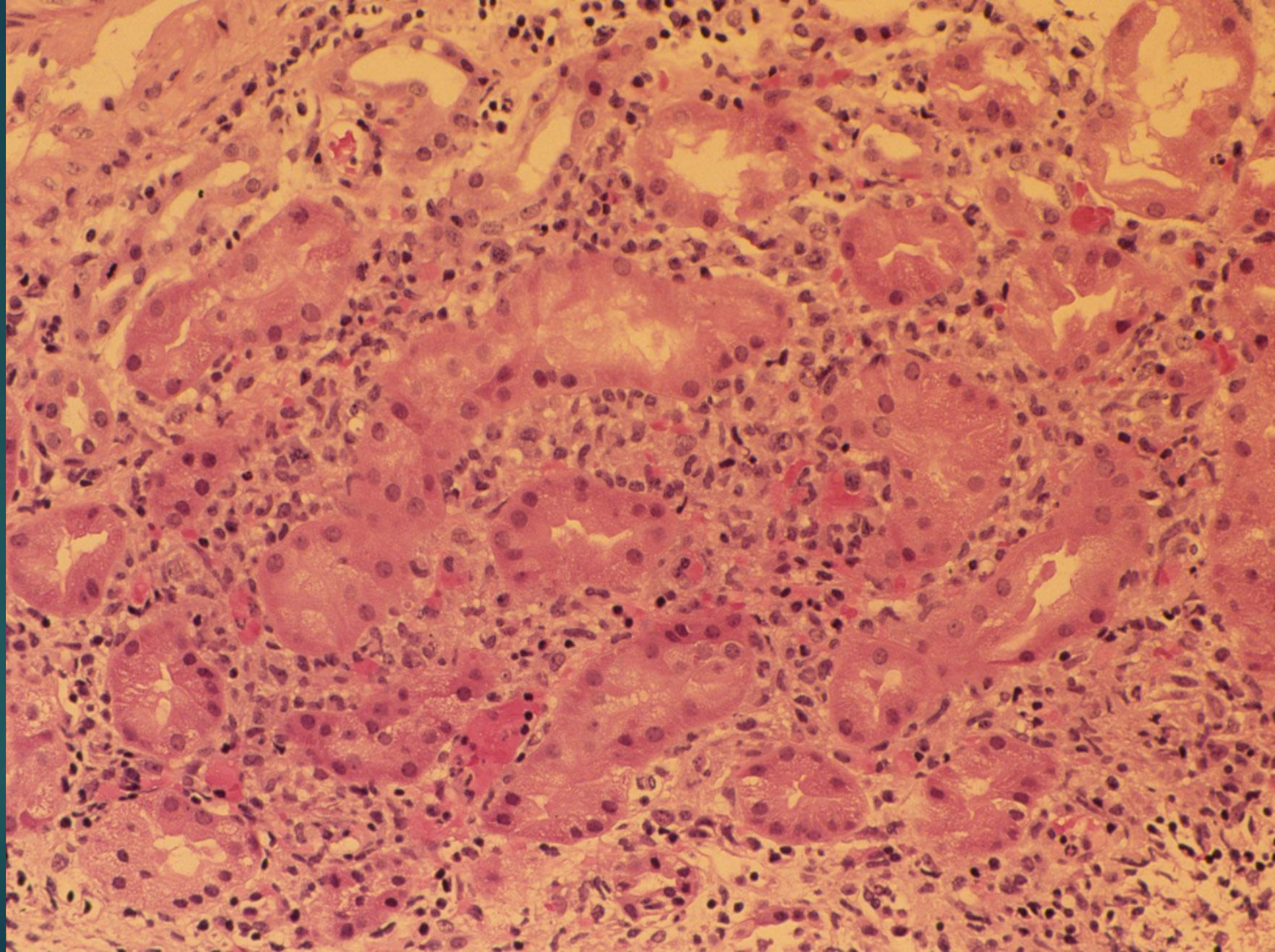
→+ Moderate tubulitis.(5 to 10)

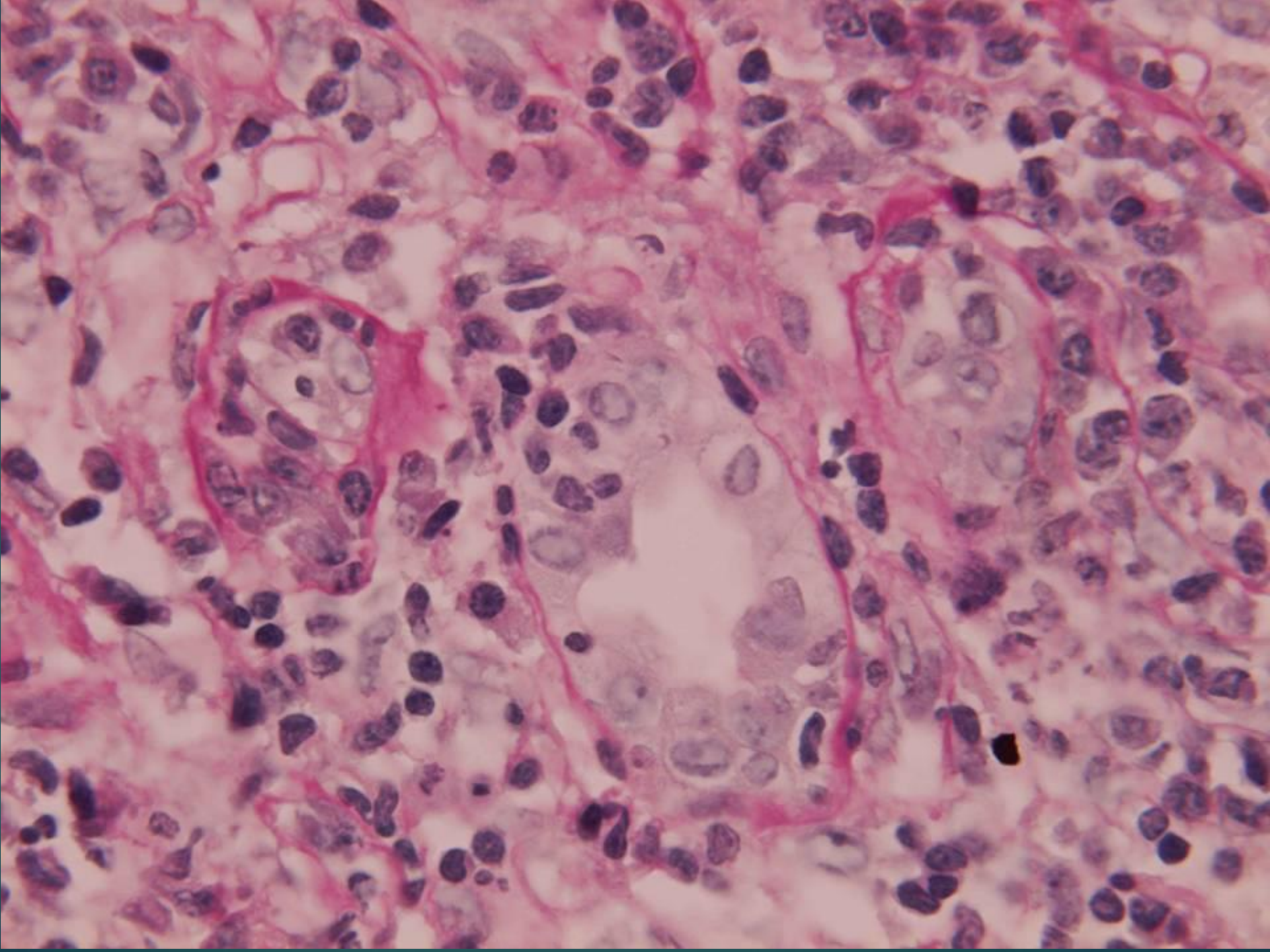


- ▶ Grade I B :→ Mononuclear interstitial inflammation (>25%)

→+ Severe tubulitis (>10)

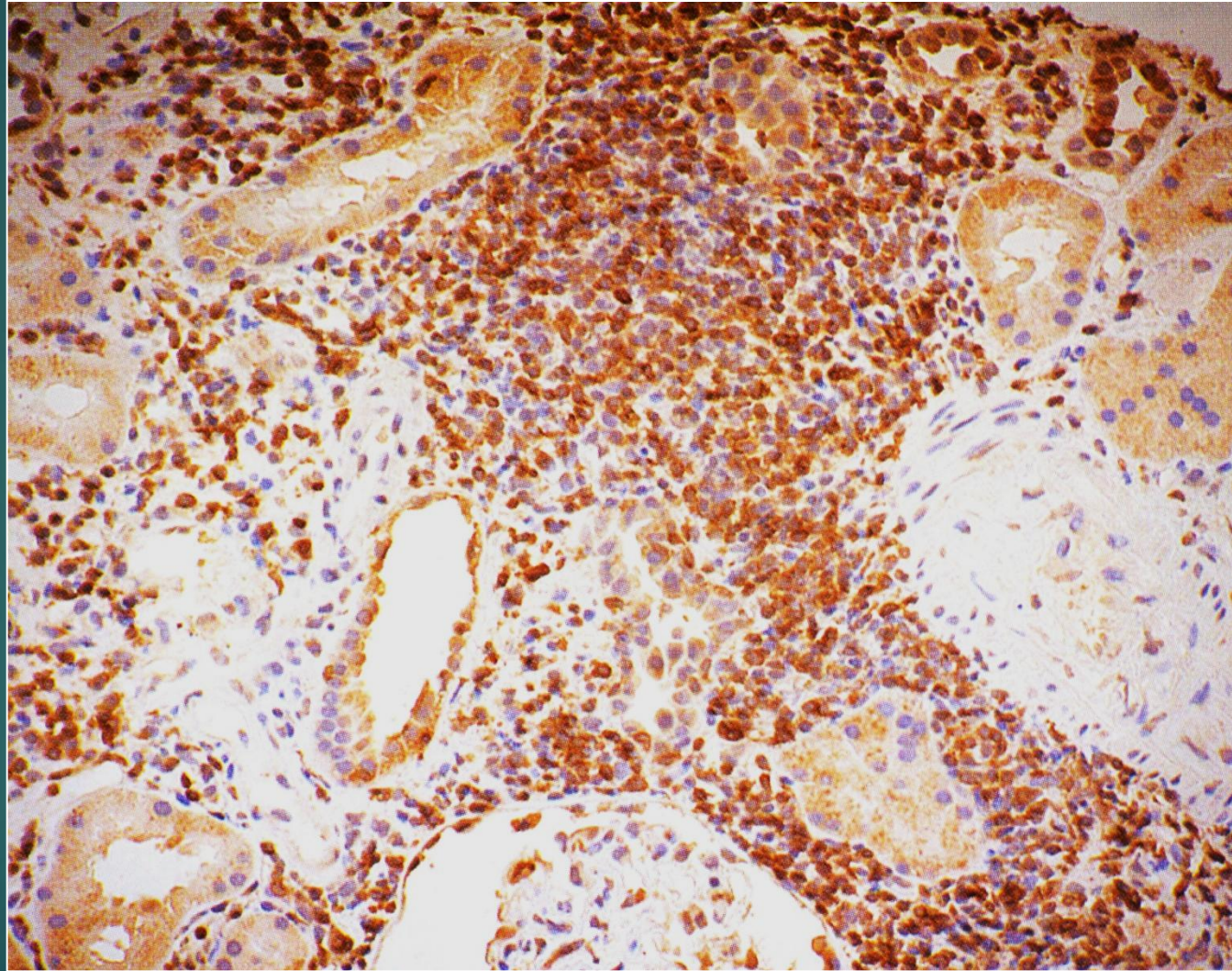






## Acute rejection.

The interstitial infiltrate consists of T cells mainly.



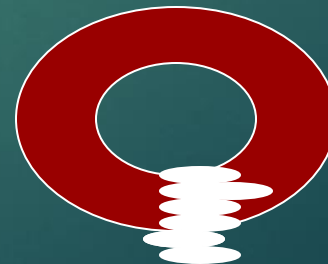
# The Banff classification

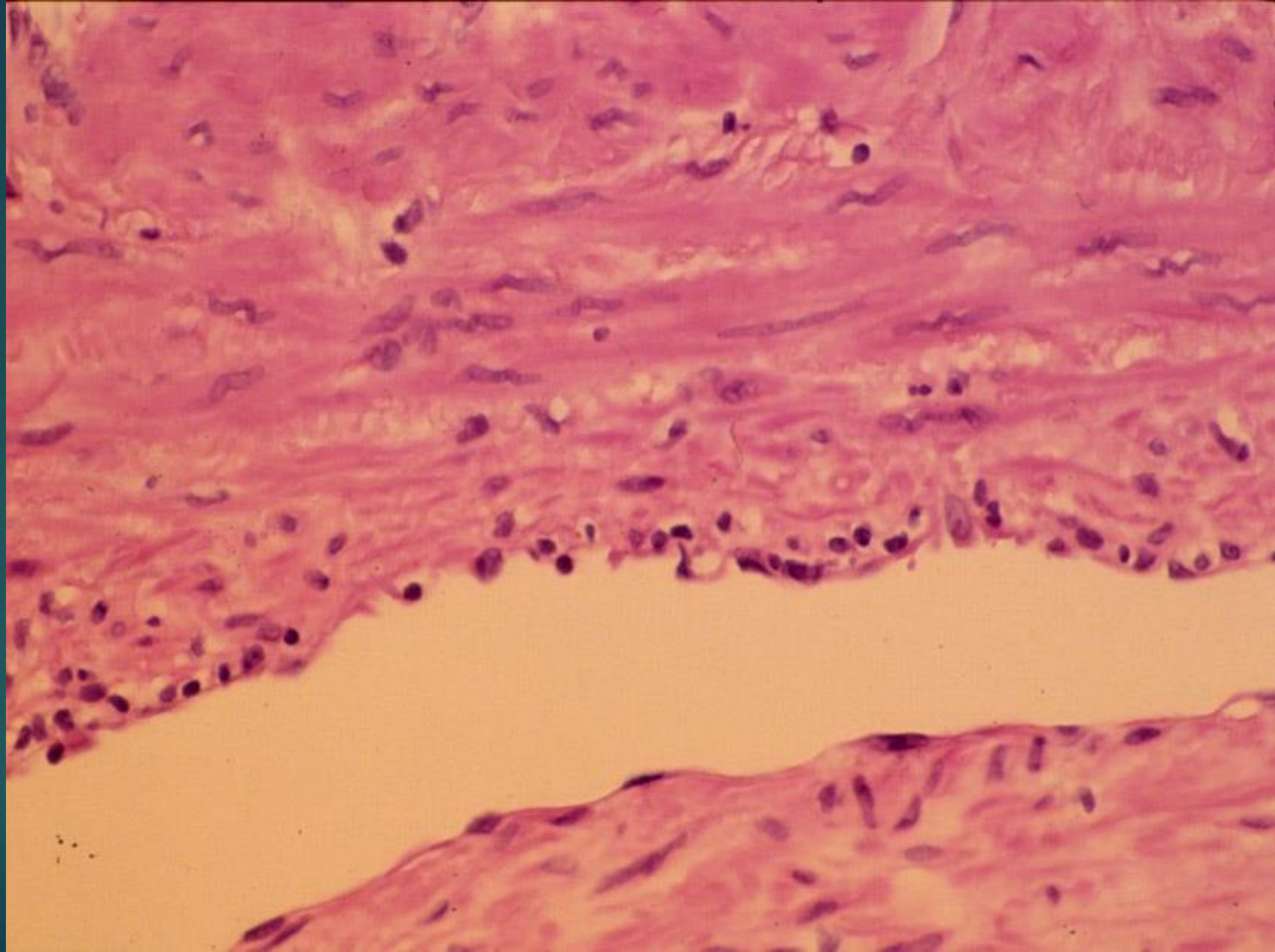
- ▶ Grade II A

Mild to Moderate intimal arteritis :

- ▶ Grade II B

Severe intimal arteritis

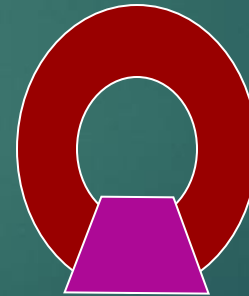






# The Banff classification

- ▶ Grade III → Transmural arteritis and/or fibrinoid necrosis.

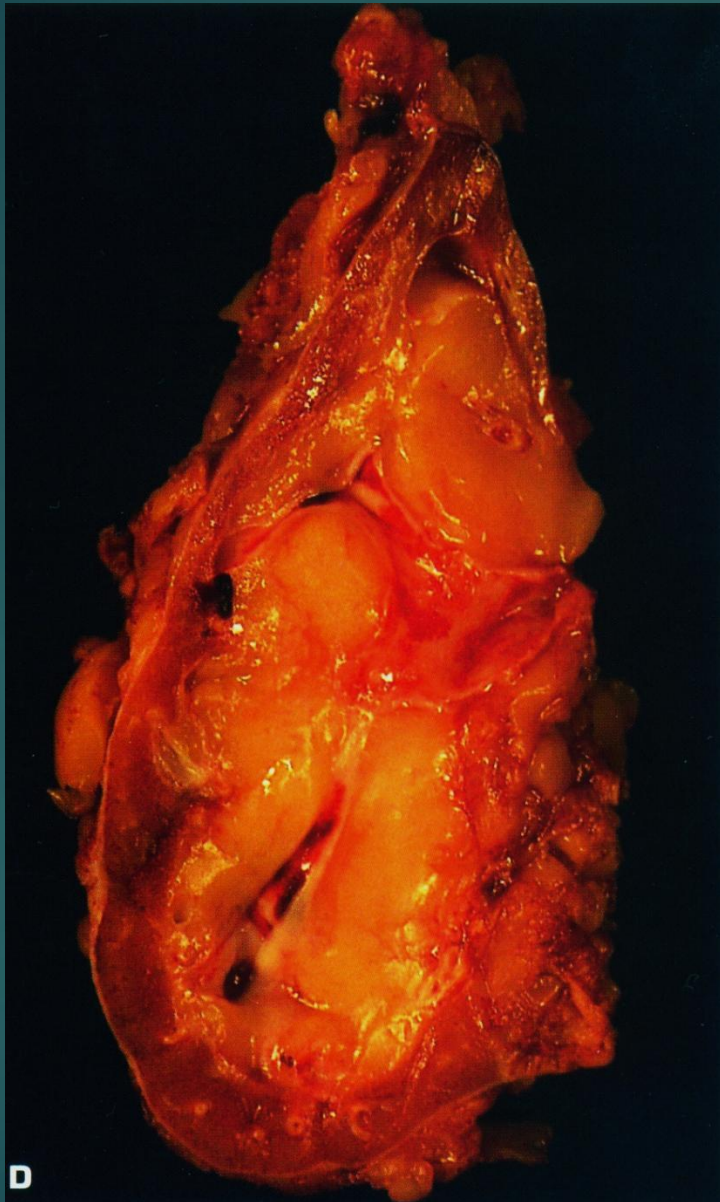


# The Banff classification

Chronic Allograft Nephropathy:

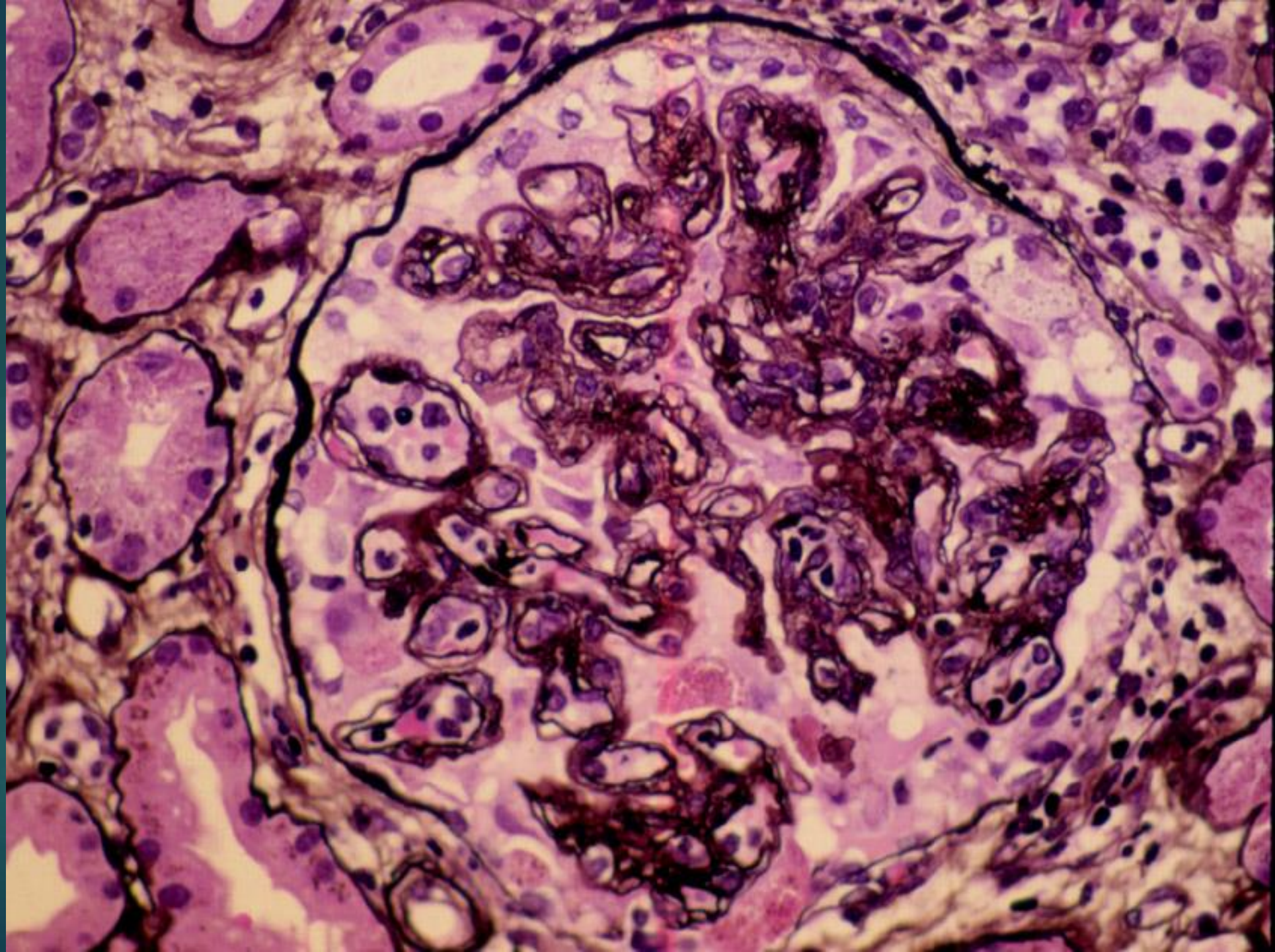
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- ▶ Grade I (Mild)
- ▶ Grade II (Moderate)
- ▶ Grade III (Severe)



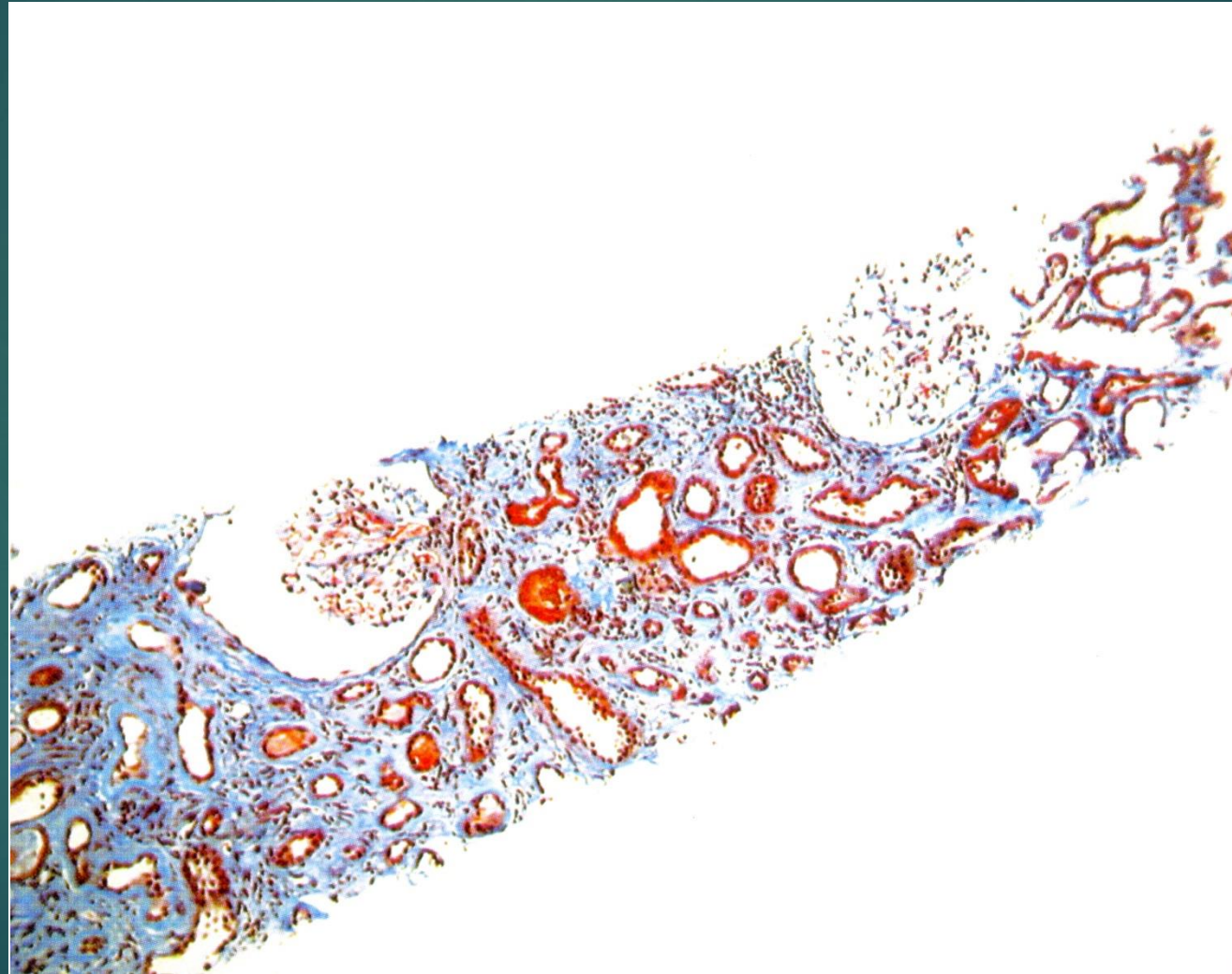
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**Severe chronic rejection.  
(graft arteriopathy).** Note the  
severe parenchymal atrophy  
and the thick-walled arteries.



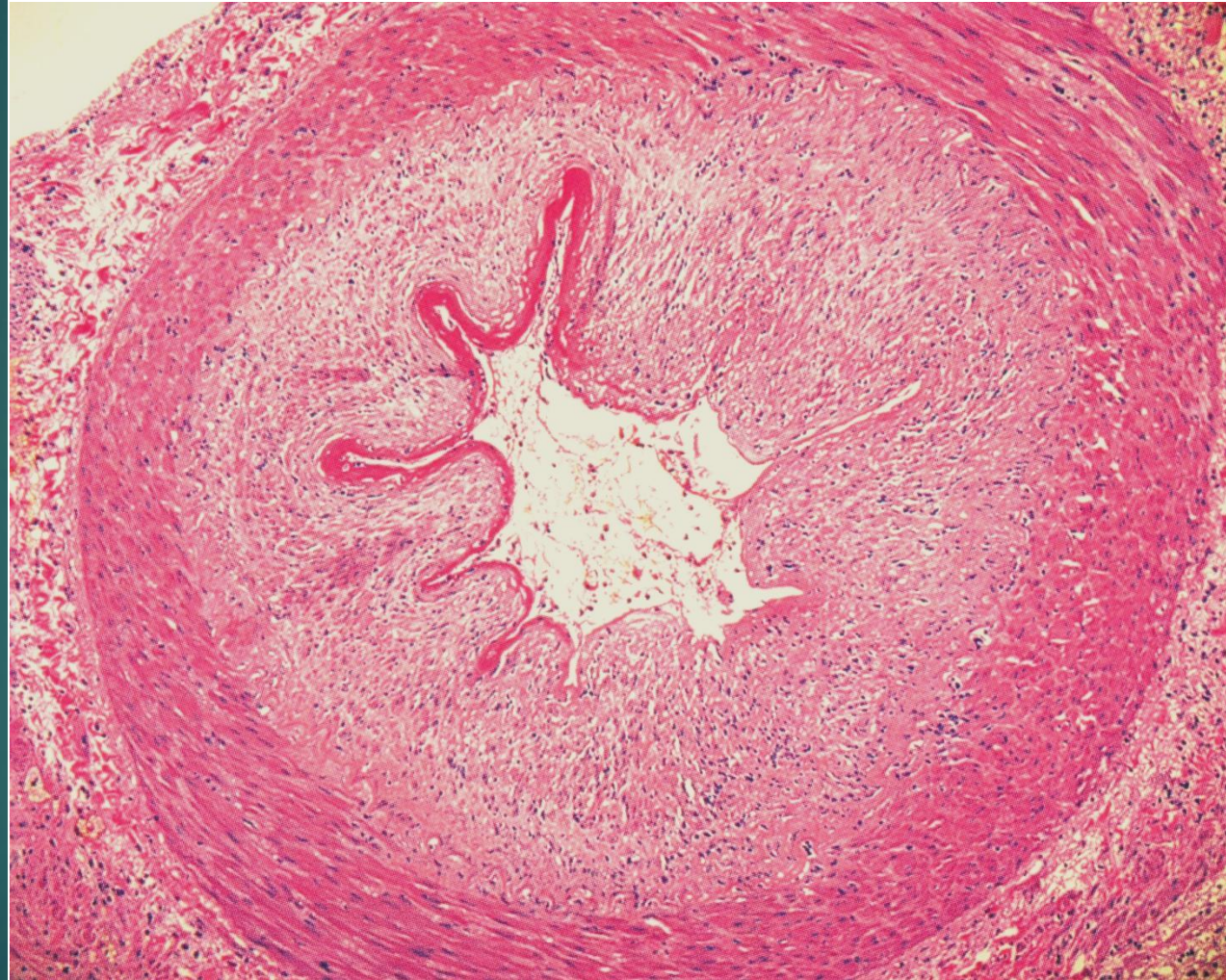
**Chronic/ sclerosing allograft nephropathy.**

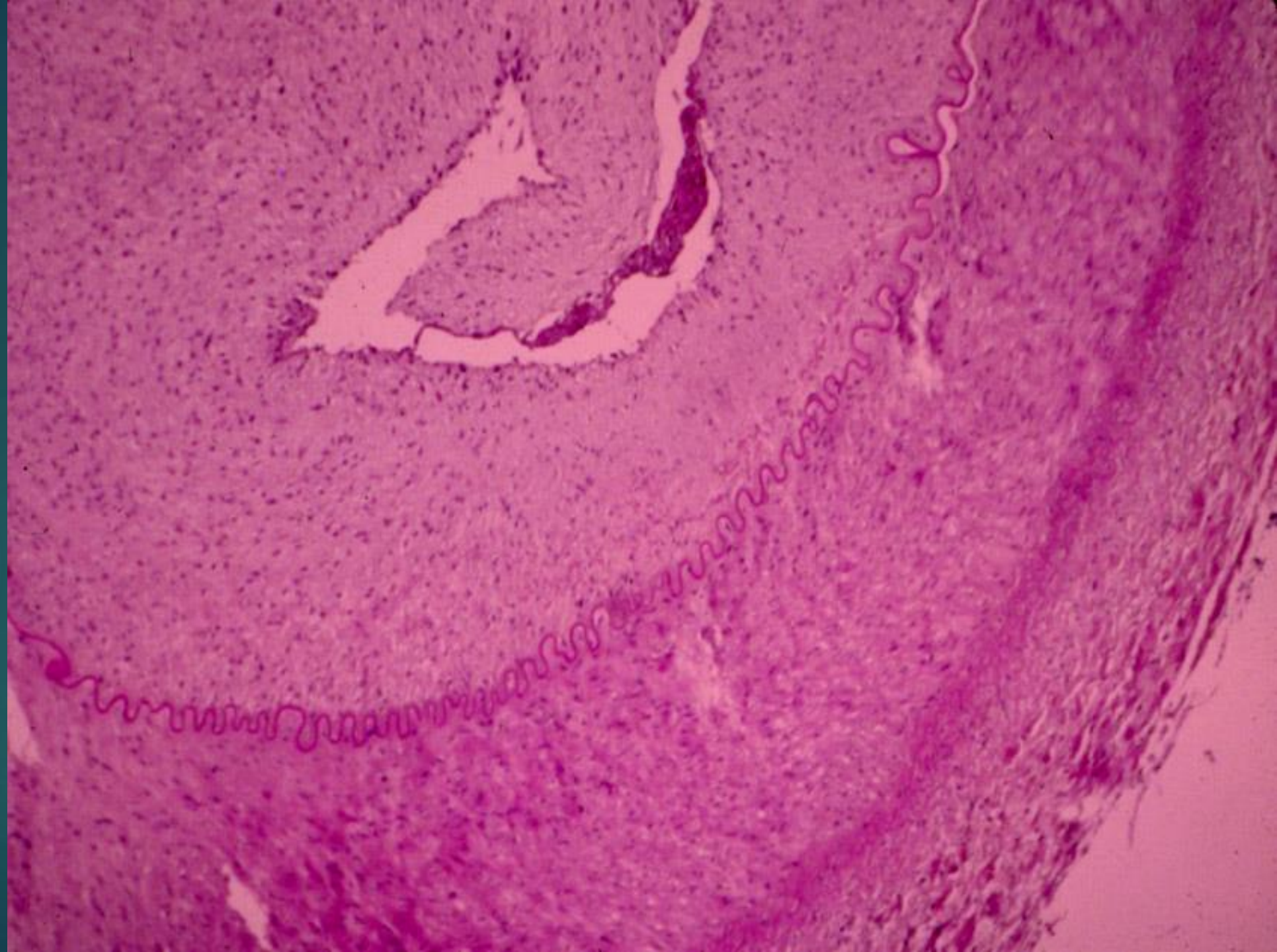
An example of Grade II-III is characterized by a diffuse increase in interstitial tissue and marked tubular atrophy as seen on this trichrome stain.



### **Chronic/ sclerosing allograft nephropathy.**

The classical lesion of chronic transplant vasculopathy is a circumferential proliferation of myointimal cells with an intact internal elastic lamina.





# The Banff classification

- ▶ Normal, Suspicious
- ▶ Grade I
- ▶ Grade II
- ▶ Grade III
- ▶ Cyclosporine toxicity
- ▶ Acute Tubular Necrosis
- ▶ Chronic rejection
- ▶ No Treatment
- ▶ Treat if clinical signs+
- ▶ Treat
- ▶ Treat or Abandon
- ▶ Reduce Cyclosporine
- ▶ Await recovery or treat
- ▶ Temporize

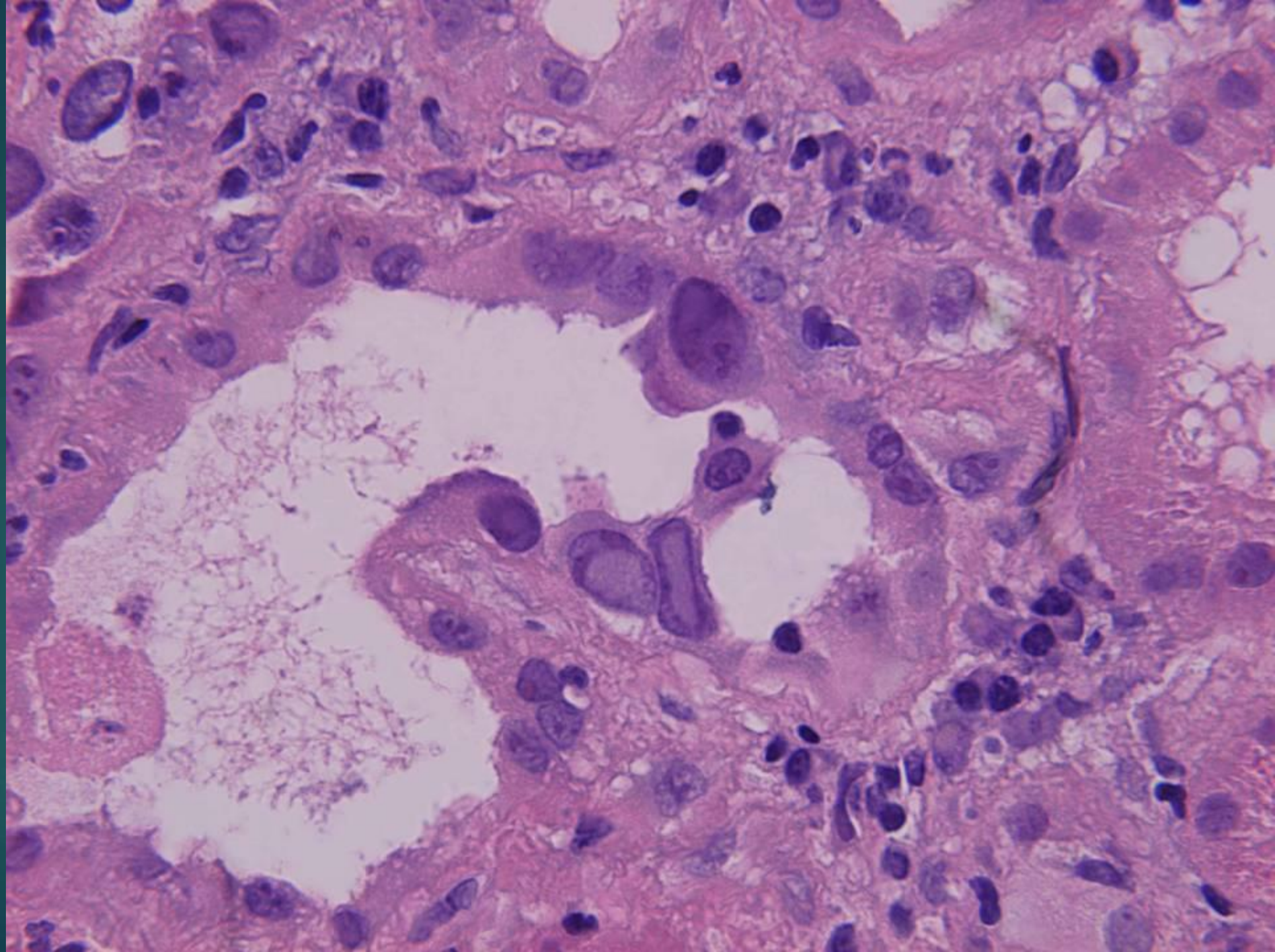


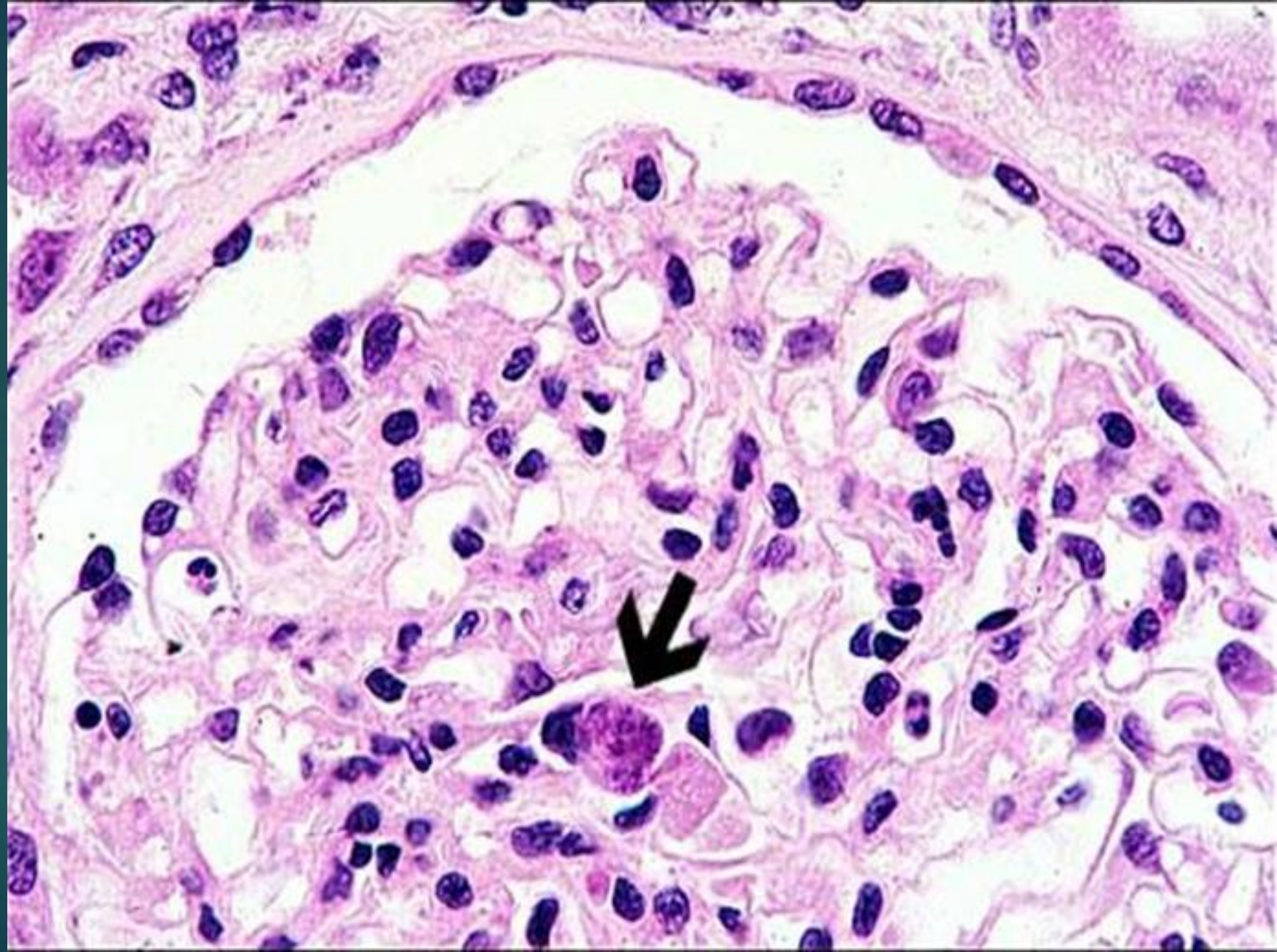


Infections

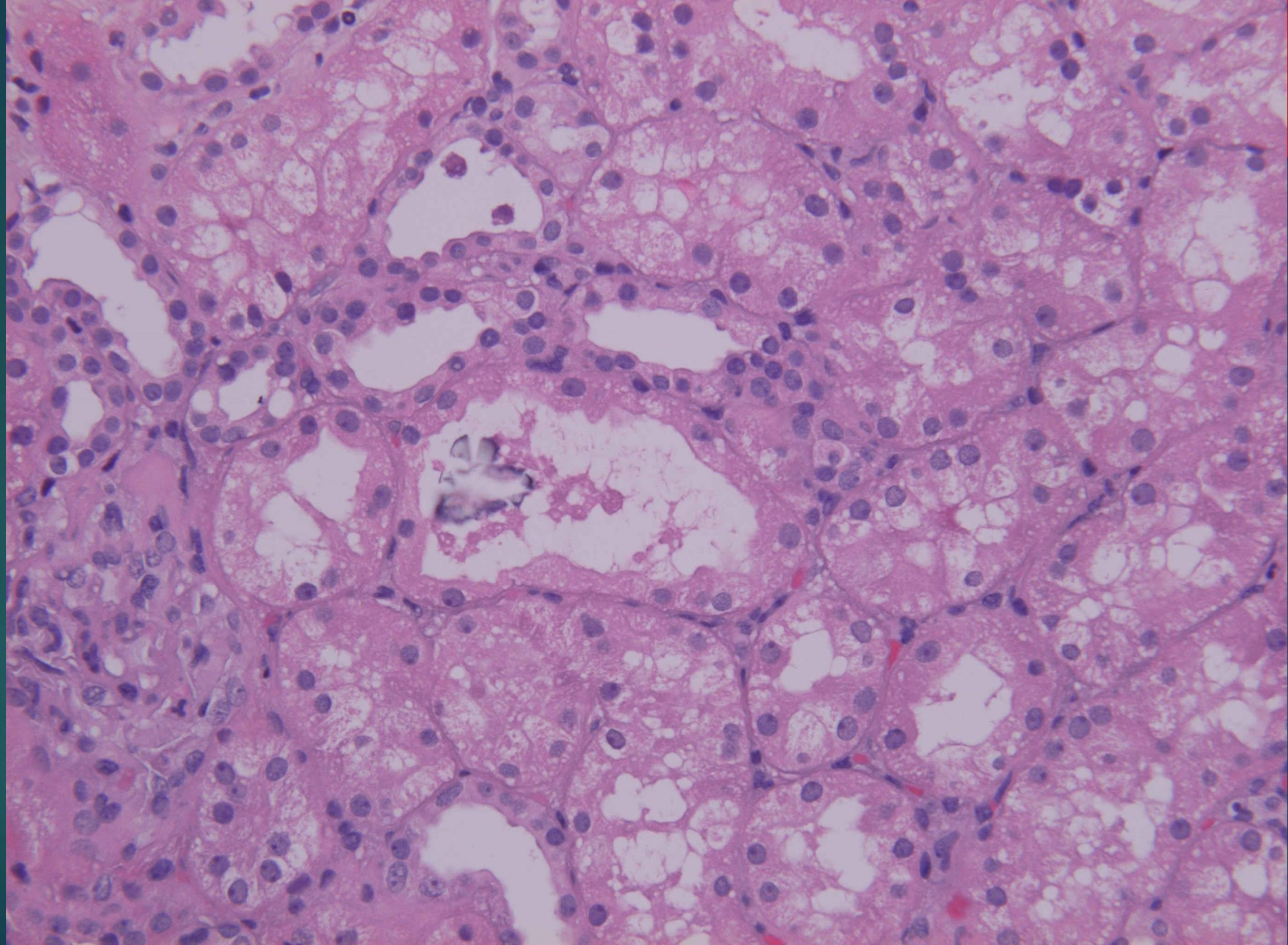
Recurrent or De Novo GN

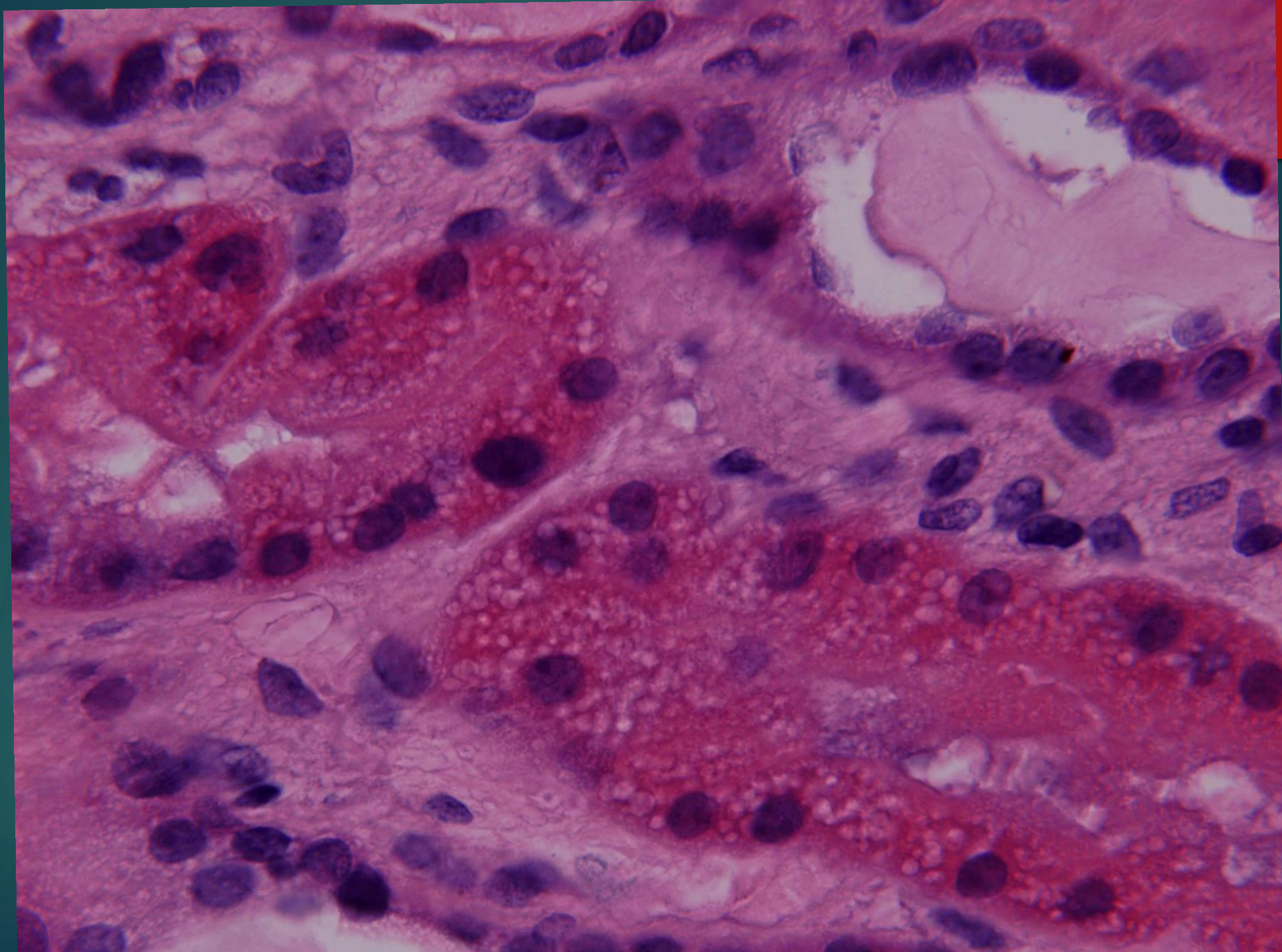






# DRUG TOXICITY

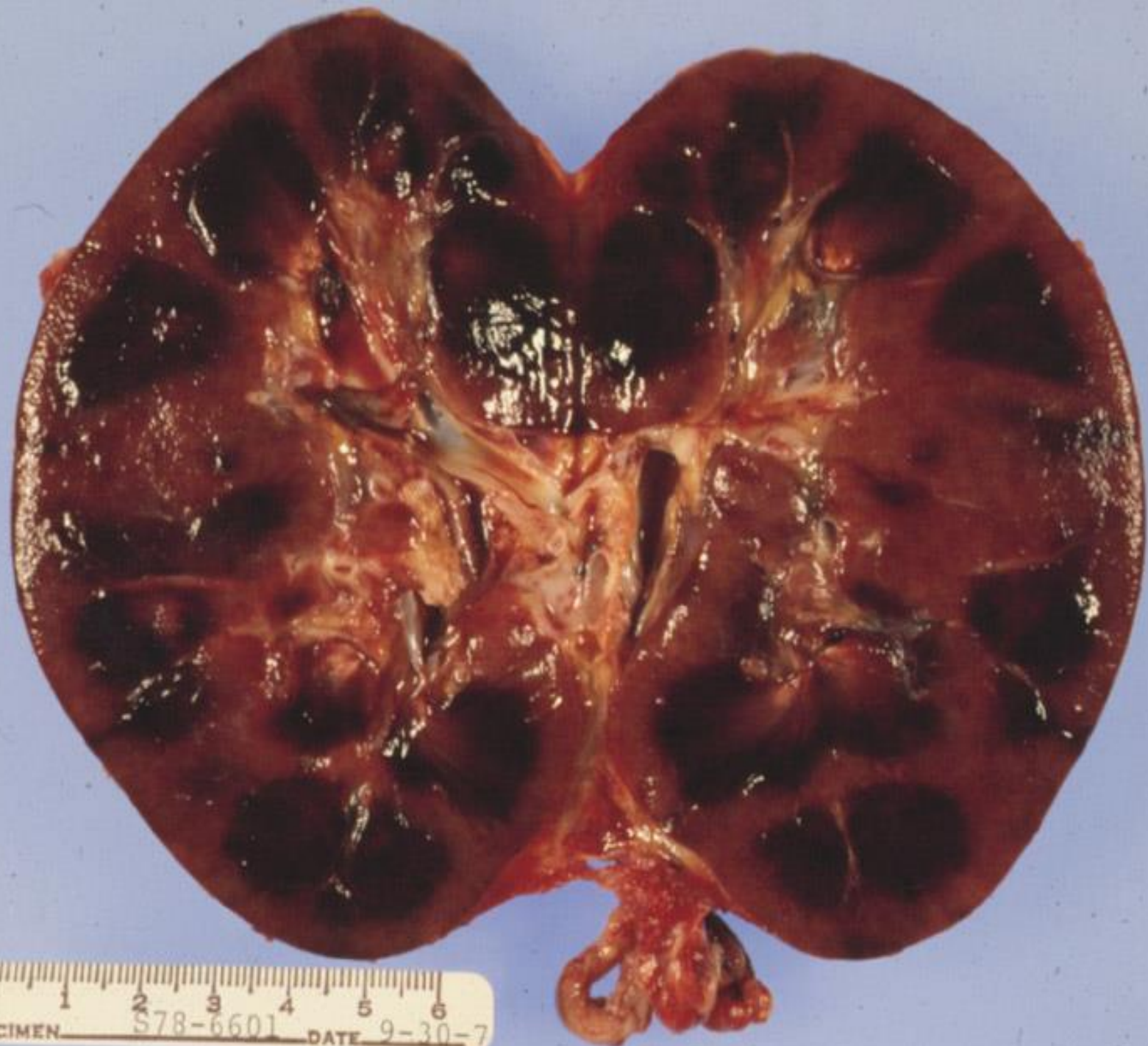




# The Banff classification

## Conclusion

- ▶ The Banff classification has proposed a schema for interpretation and gradation of the histological findings in renal allograft biopsies that can be used as an indication for therapeutic consequences and expected graft survival.



cm 1 2 3 4 5 6  
SPECIMEN S78-6601 DATE 9-30-7