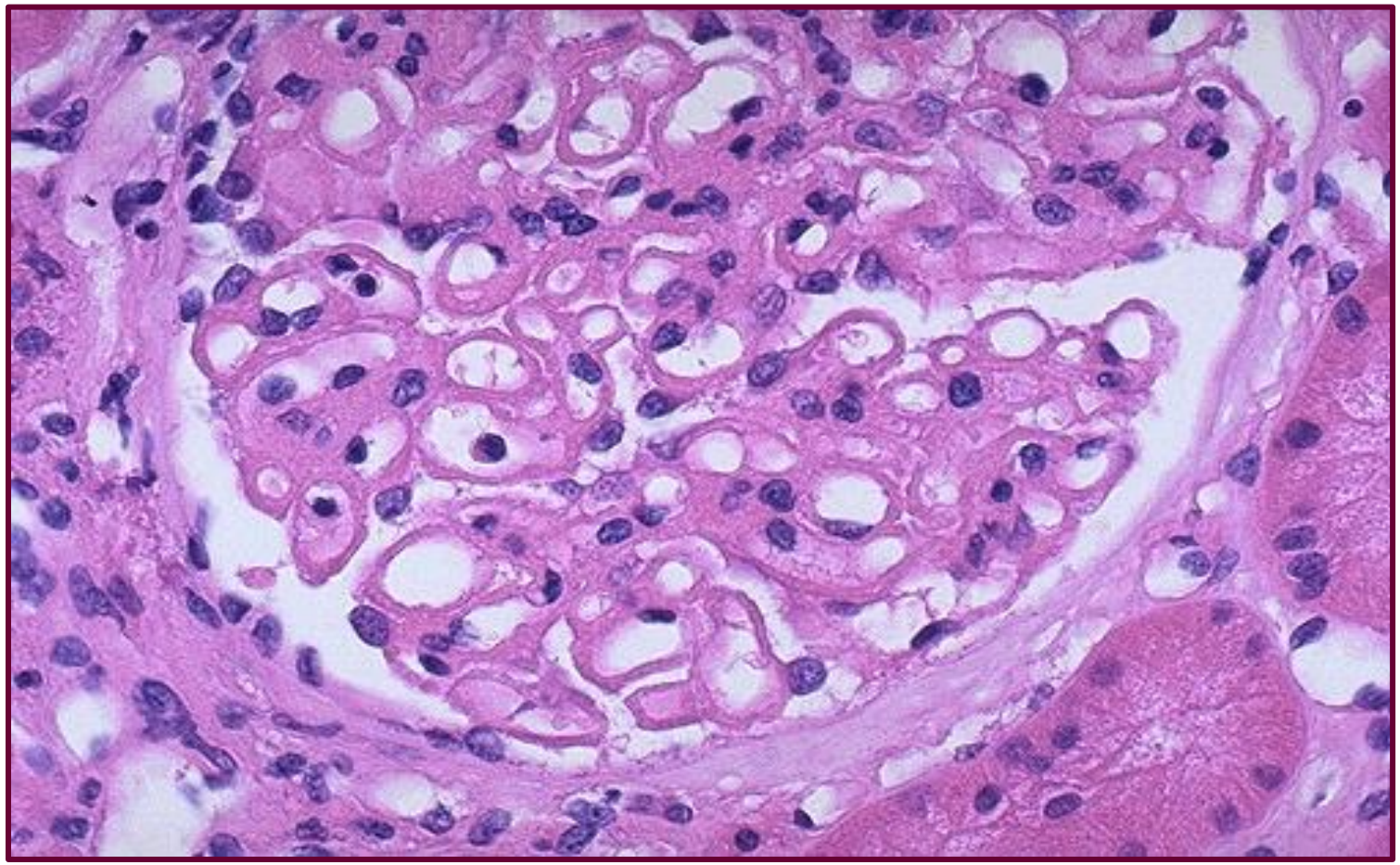
PRACTICAL SESSION : 3

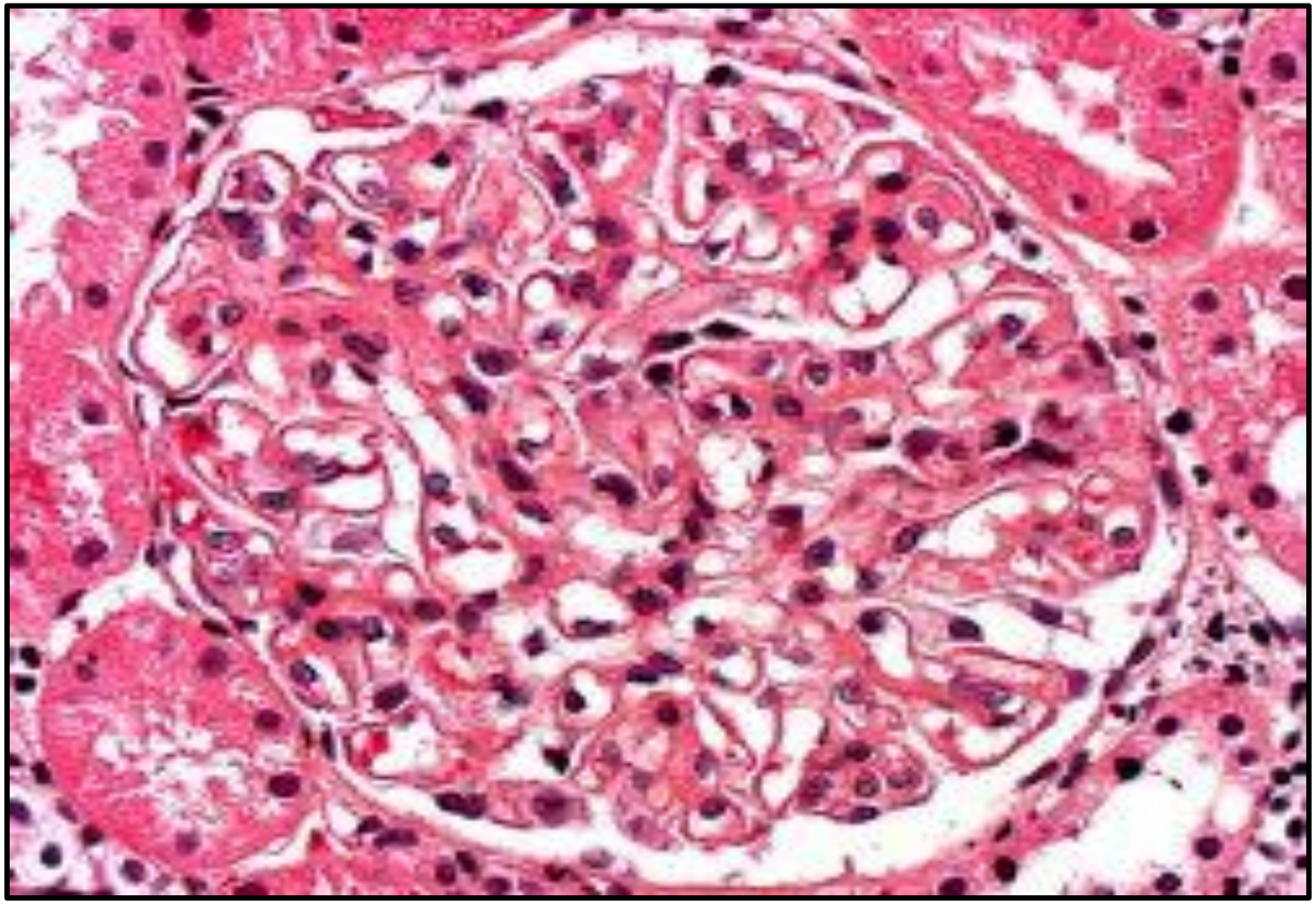
NEPHROTIC SYNDROME

Membranous Glomerulonephritis



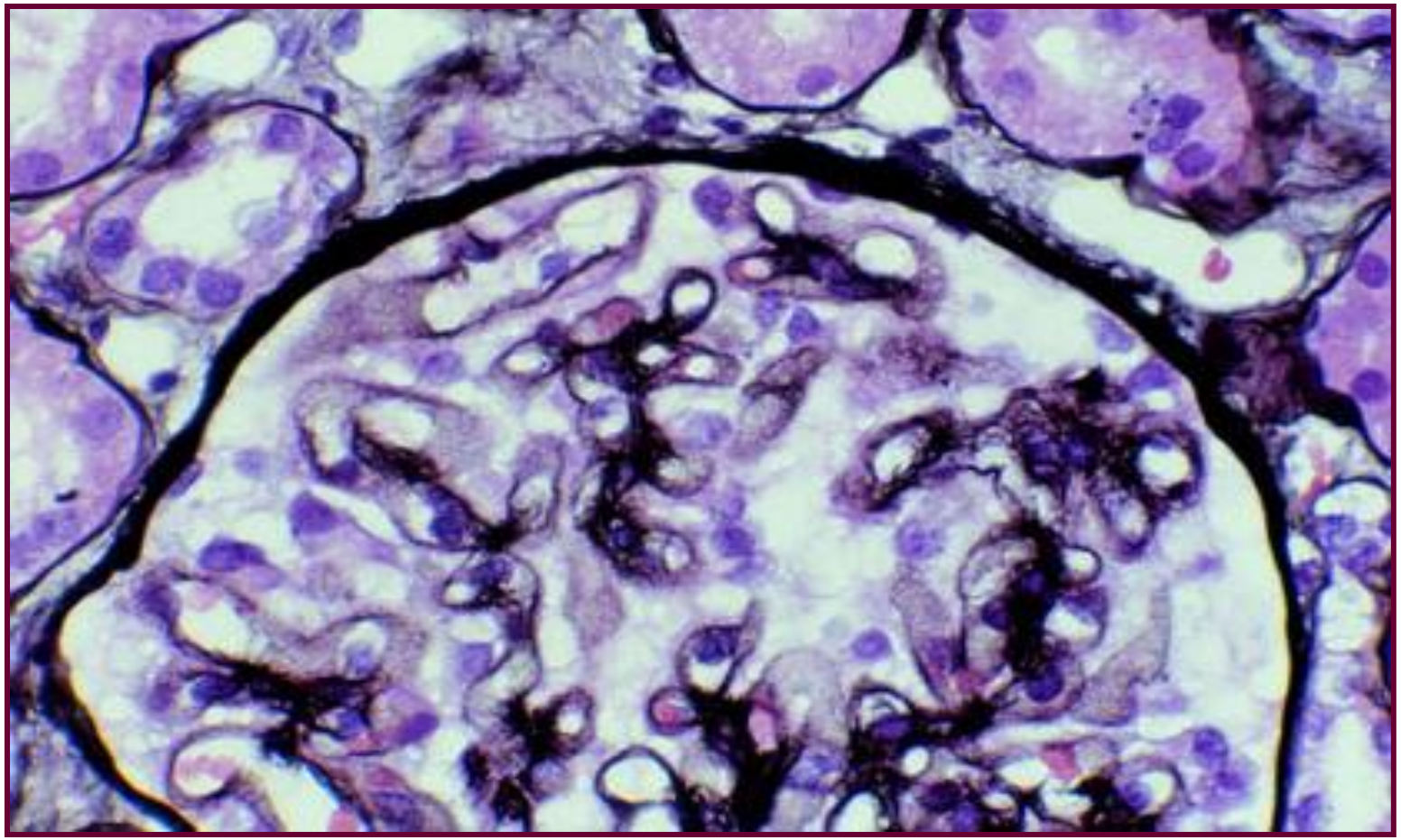
Membranous glomerulonephritis (The common cause of Nephrotic syndrome in adults): the capillary loops are thickened and prominent, but the cellularity is not increased.

Membranous Glomerulonephritis



Close-up of glomerulus illustrating rigid, uniformly-thickened capillary walls (H&E stain, 400x original magnification).

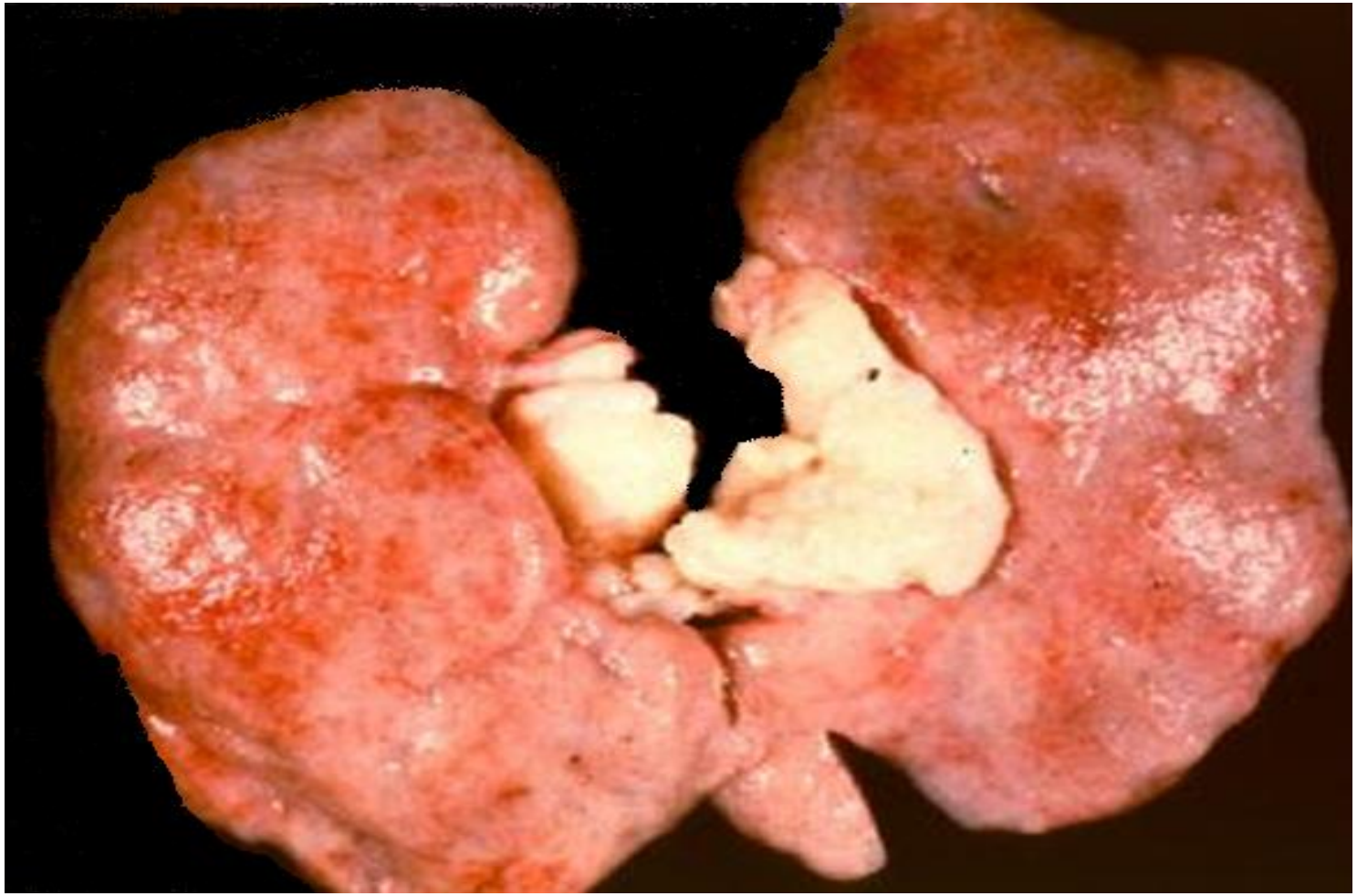
Membranous Glomerulonephritis



Early stage II membranous glomerulonephritis: The thickened capillary wall shows numerous "holes" in tangential sections, indicating deposits. (Deposits do not take up the silver stain.) Well-developed spikes around the deposits are not present here.

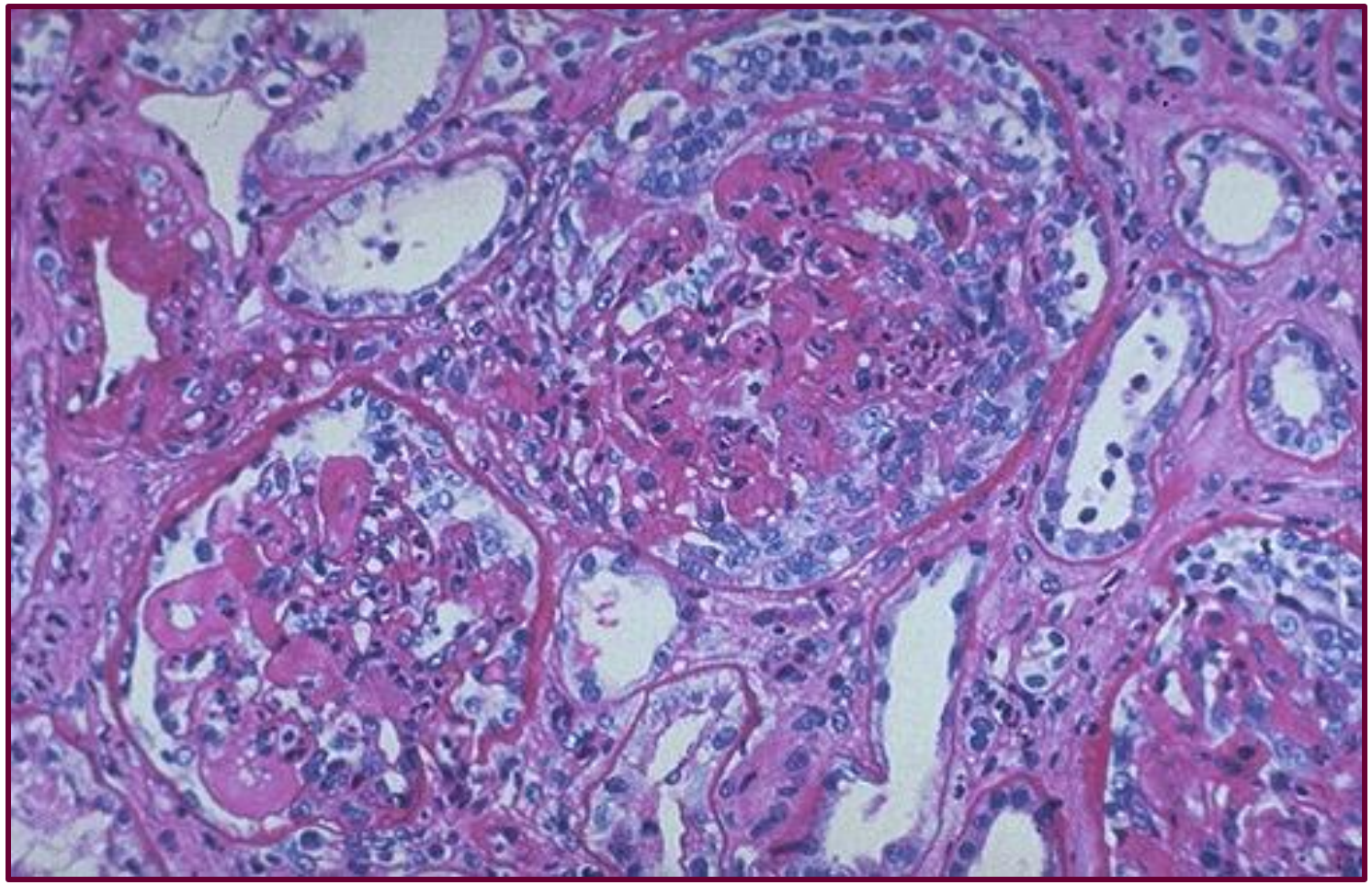
NEPHRITIC SYNDROME (RPGN)

Rapid Progressive Glomerulonephritis (RPGN)



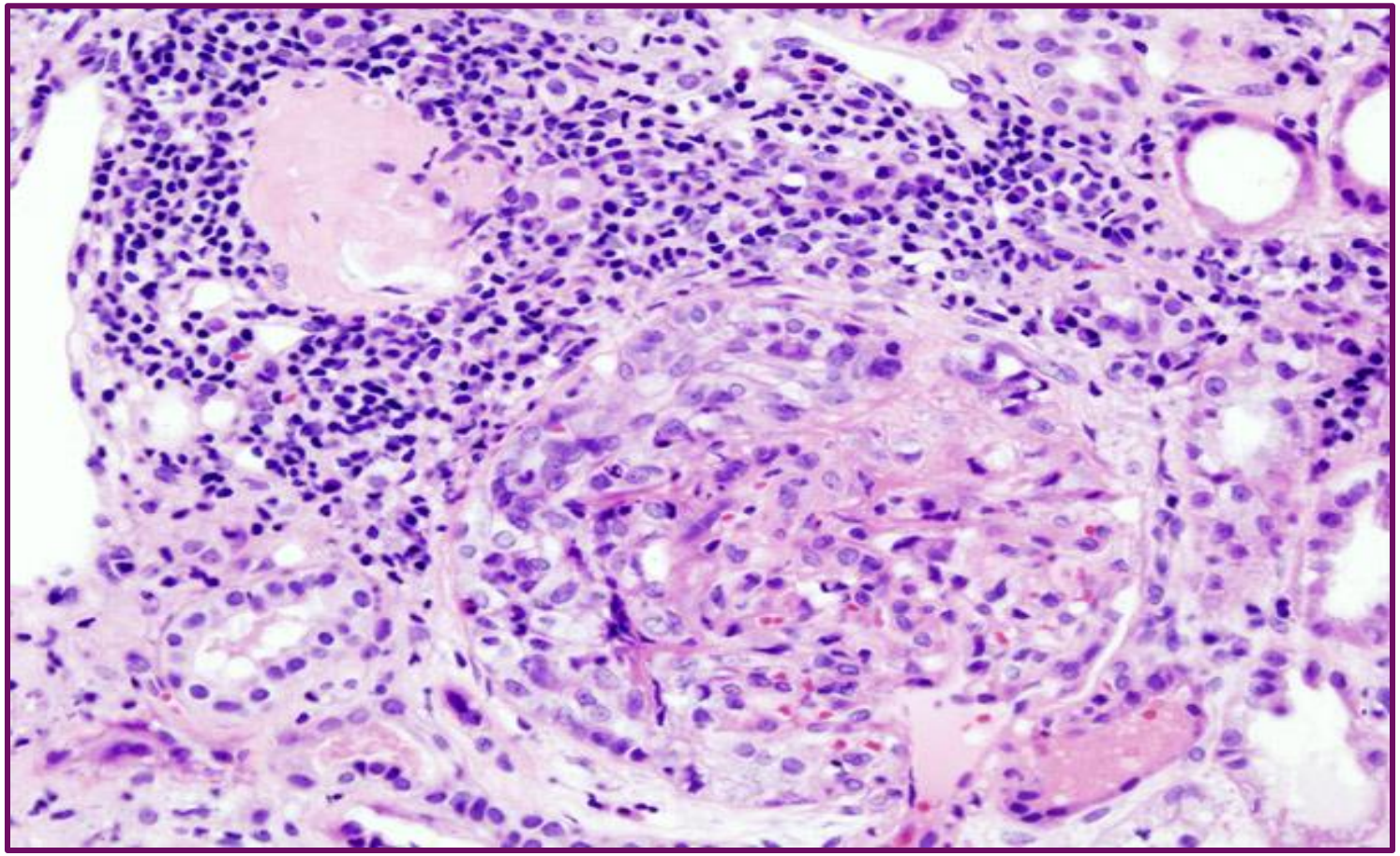
Gross appearance of RPGN - note the flea beaten appearance

Rapid Progressive Glomerulonephritis (RPGN)



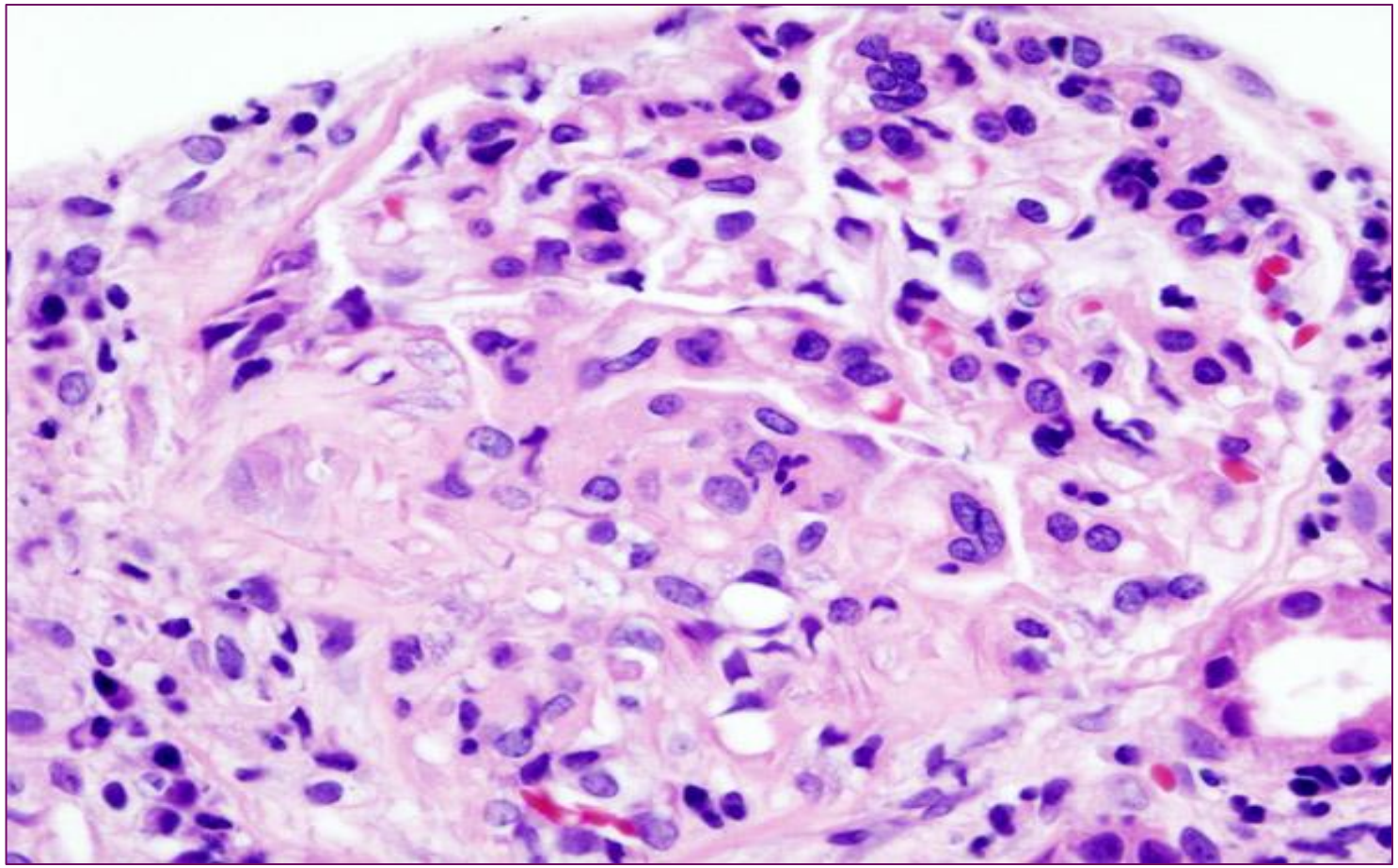
Seen here within the glomeruli are crescents composed of proliferating epithelial cells. Crescentic glomerulonephritis is known as rapidly progressive glomerulonephritis (RPGN) because this disease is very progressive

Rapid Progressive Glomerulonephritis (RPGN)



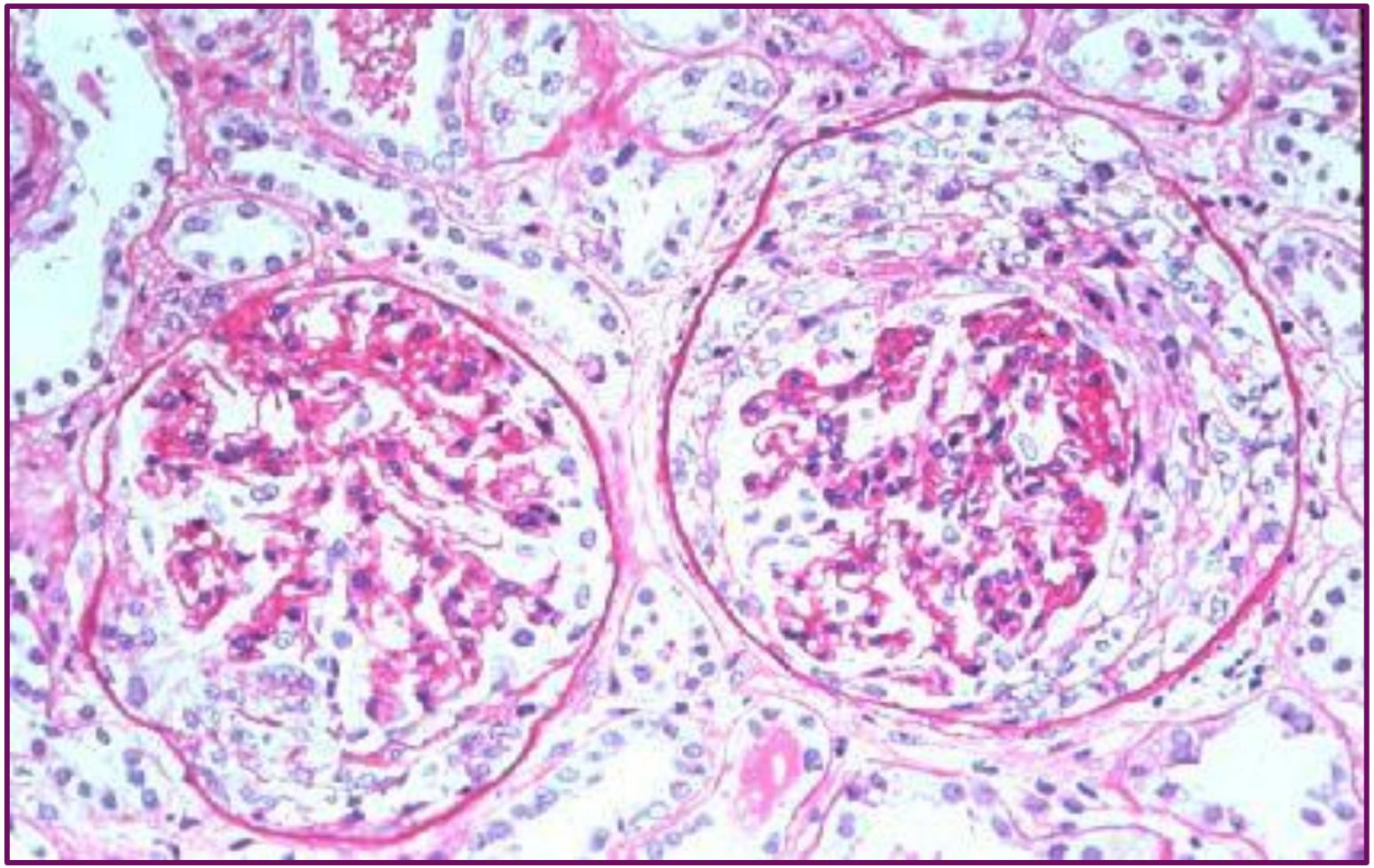
Crescentic glomerulonephritis in a patient with Rapid Progressive Glomerulonephritis (RPGN) . All types of RPGN are characterized by glomerular injury and formation of crescents with monocytes and macrophages proliferation compressing the glomerulus

Rapid Progressive Glomerulonephritis (RPGN)



In severe injury, fibrin contribute most strongly to crescent formation. Epithelial cells of Bowman capsule are proliferated . Infiltrating WBCs such as monocytes and macrophages also proliferate compressing the glomerulus, forming a crescent-shaped scar

Rapid Progressive Glomerulonephritis (RPGN)



Epithelial cells of Bowman capsule are proliferated . Infiltrating WBCs such as monocytes and macrophages also proliferate compressing the glomerulus, forming a crescent-shaped scar

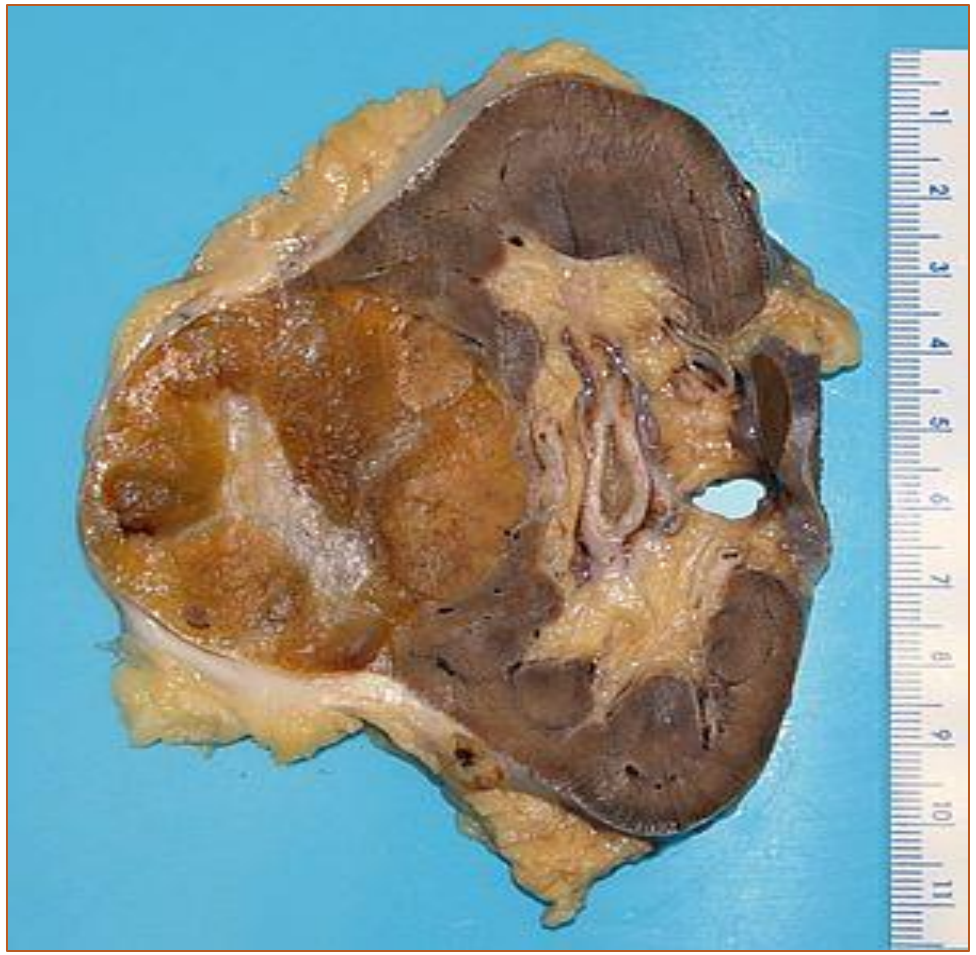
RENAL TUMORS

BENIGN RENAL TUMORS

RARE Tumors

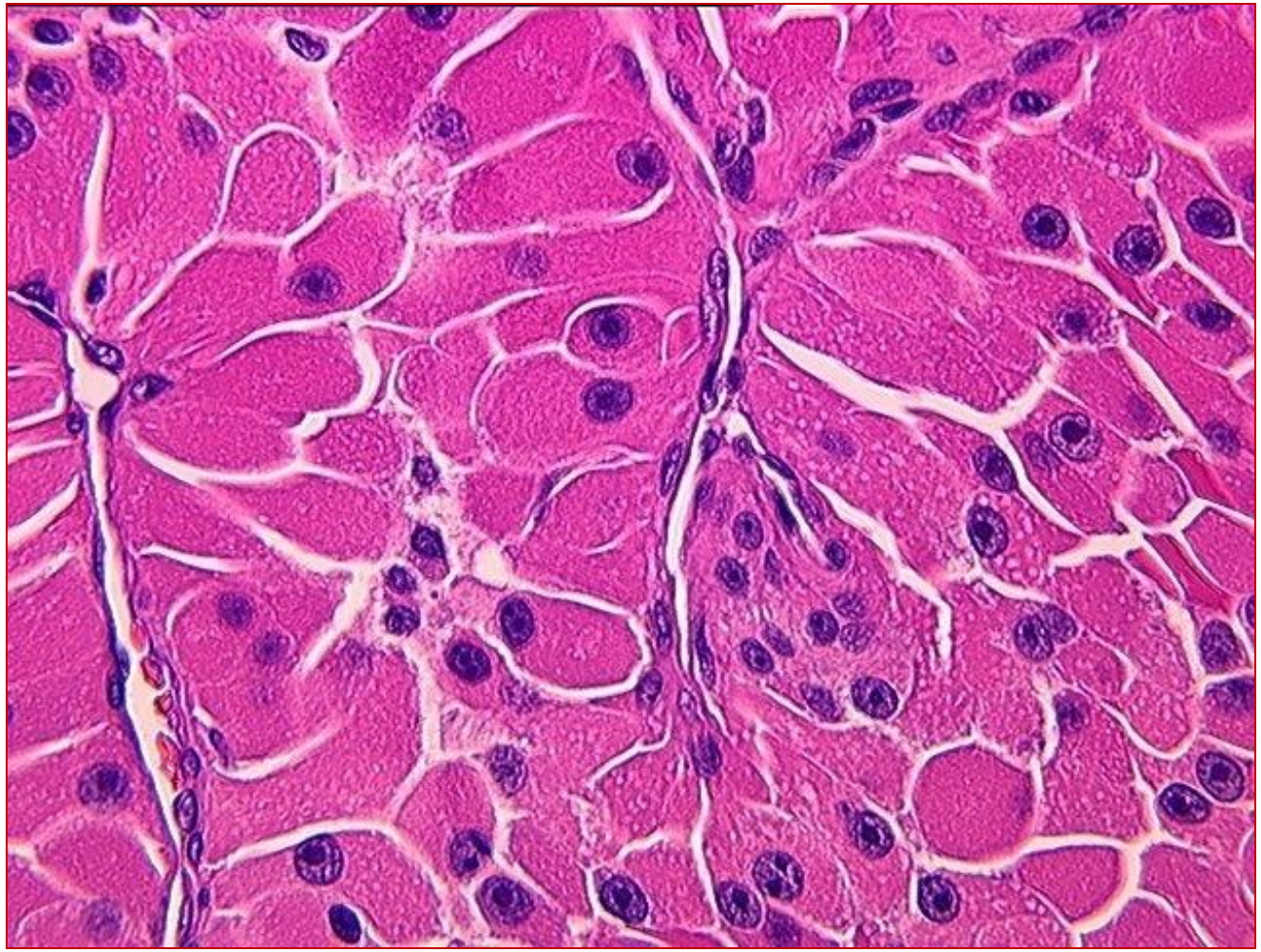
- *Papillary Adenoma (SIZE very important)*
- *Fibroma/ Hamartoma*
- *Angiomyolipoma*
- *Oncocytoma (very red, granular, mitochondria)*

Oncocytoma - Gross



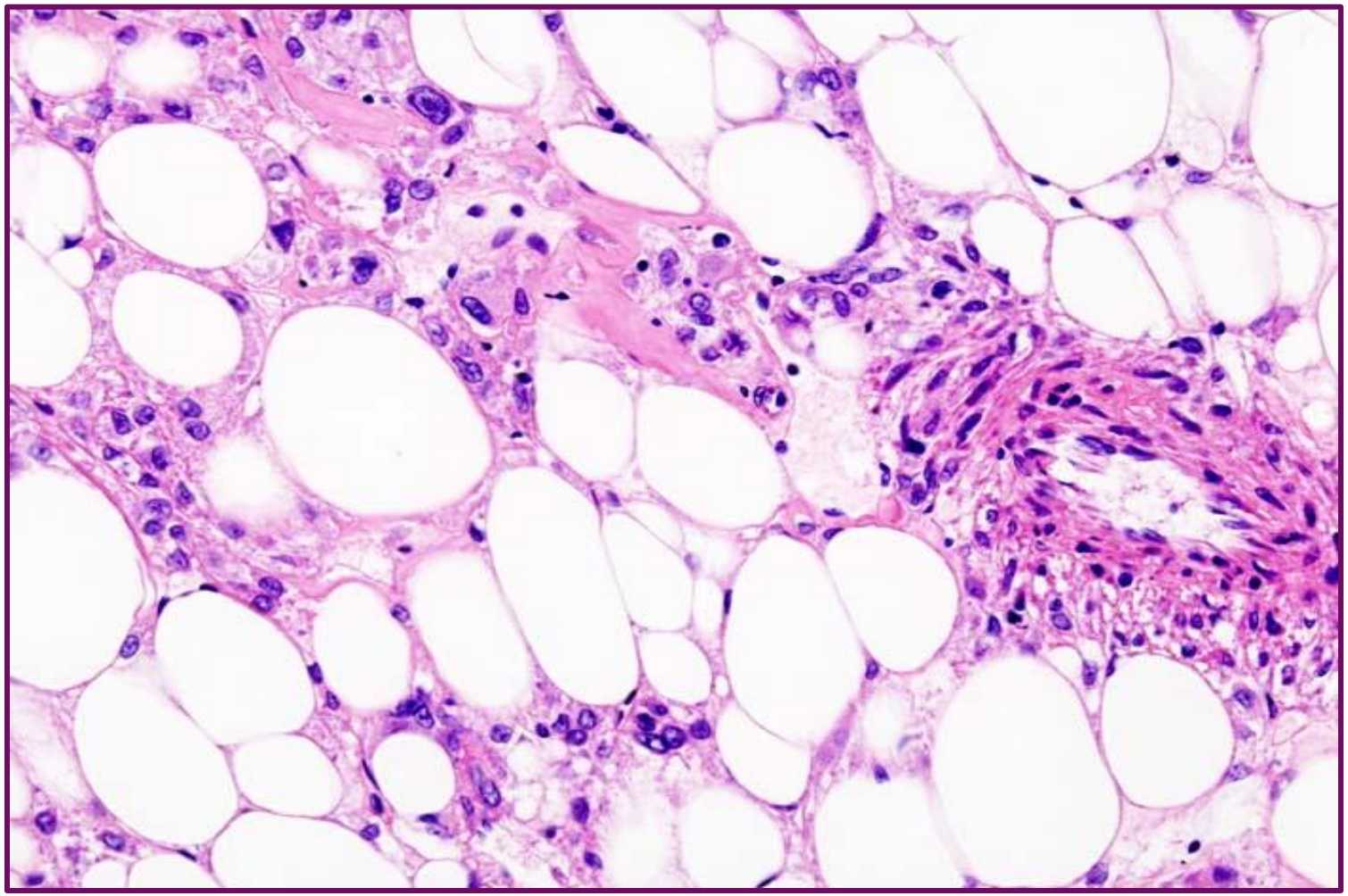
Gross *appearance of a renal oncocytoma (left of image) and a slice of a normal kidney (right of image). Note the rounded contour, the mahogany colour and the central scar*

Oncocytoma



Oncocytes are very RED and granular

Angiomyolipoma

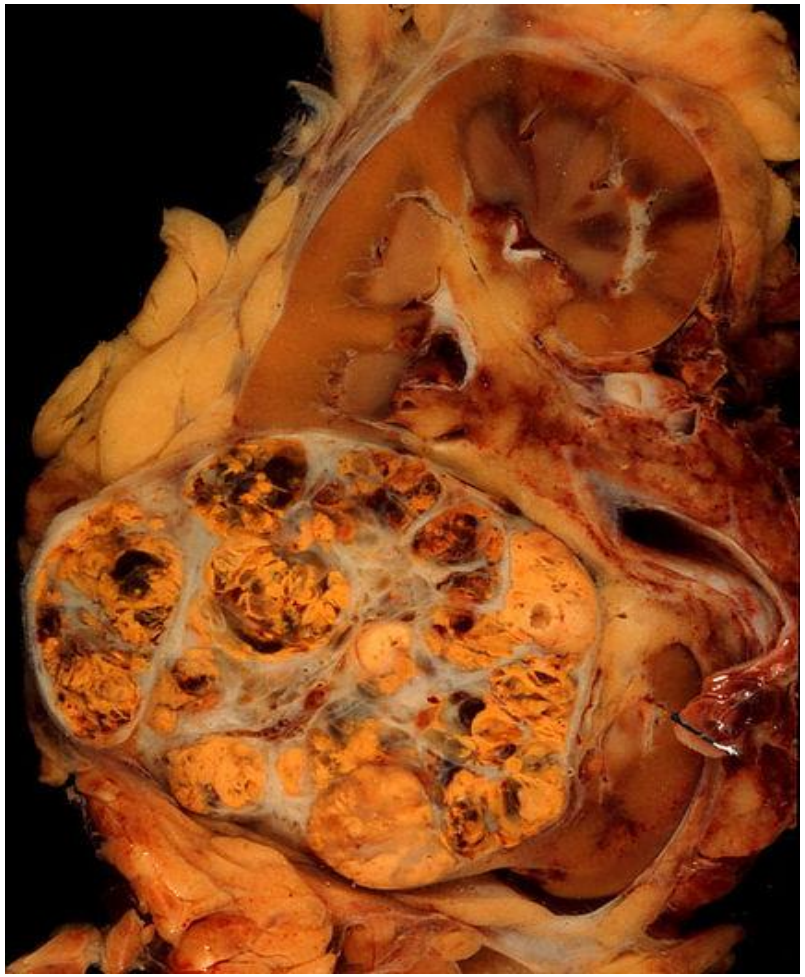


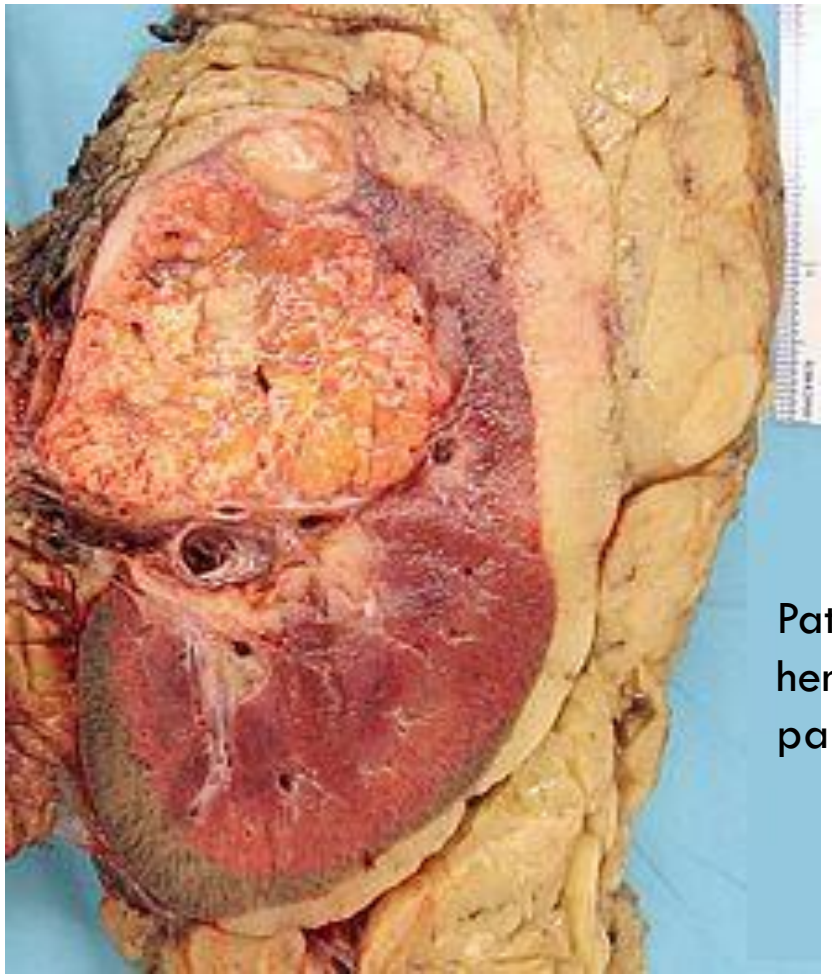
Benign tumor composed of vessels, smooth muscle and fat

MALIGNANT RENAL TUMORS

- *Renal Cell Carcinoma :*
  - *Clear Cell Carcinoma*
  - *Adenocarcinoma*
  - *Hypernephroma*
- *Urothelial (Transitional)*

Renal Clear Cell Carcinoma – Gross pathology

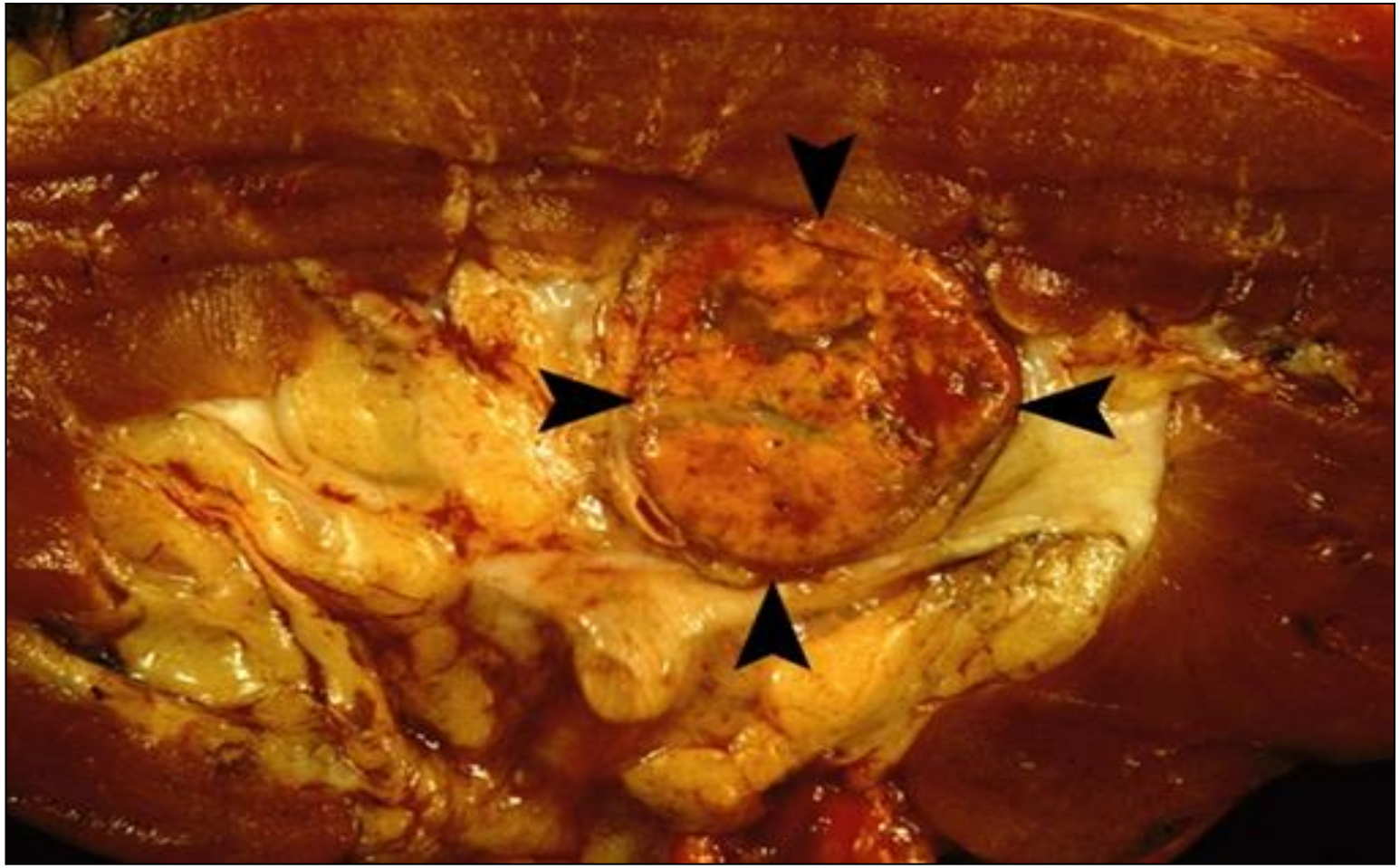




Patient presents with hematuria, flank pain and palpable mass (abdomen).

Well circumscribed partly yellowish and partly haemorrhagic cortical renal mass showing a pseudo capsule.

Renal Clear Cell Carcinoma – Gross

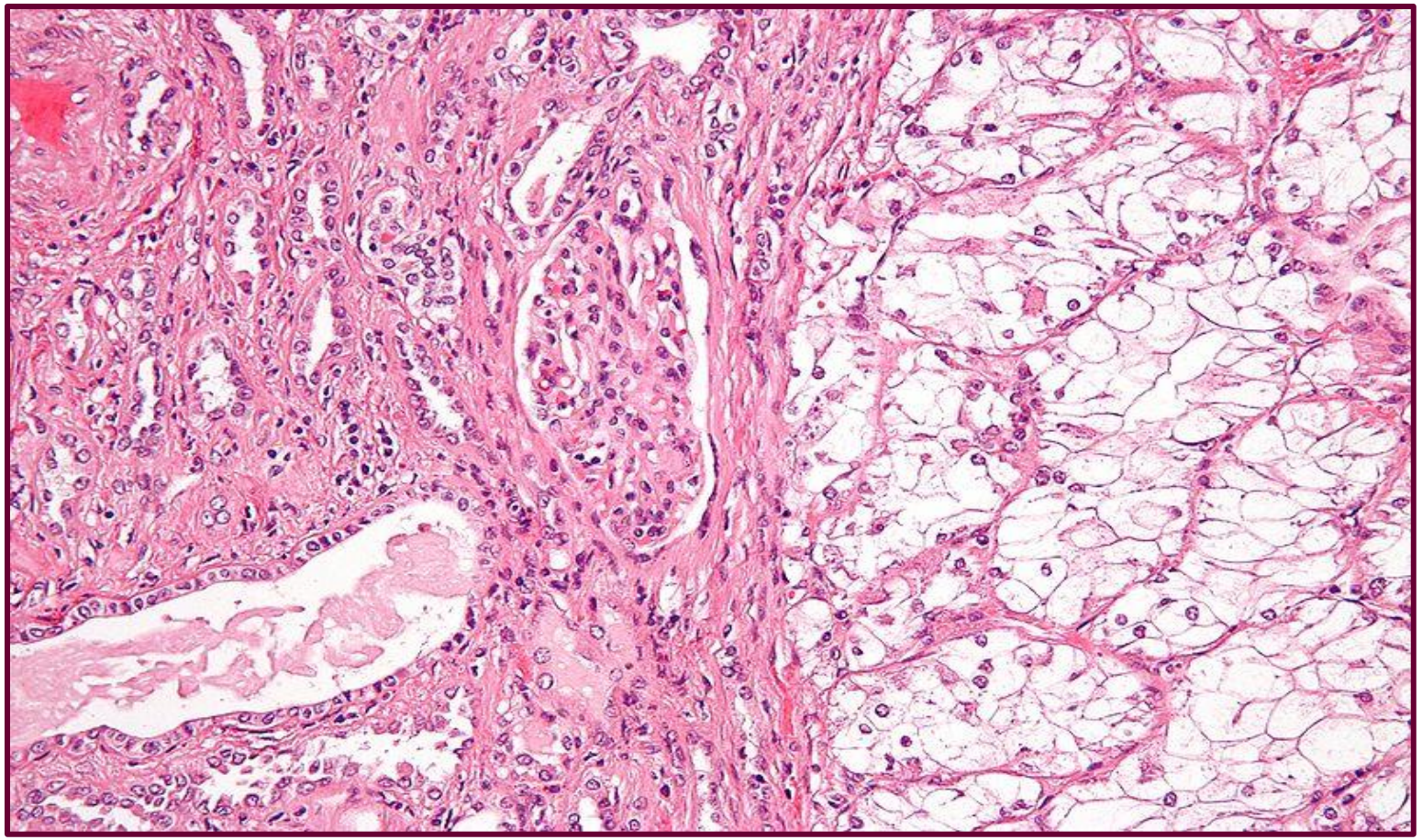


Renal clear cell carcinoma. *The tumor is well demarcated from the surrounding non-neoplastic renal parenchyma by a pseudocapsule*

Renal Clear Cell Carcinoma - Histopathology

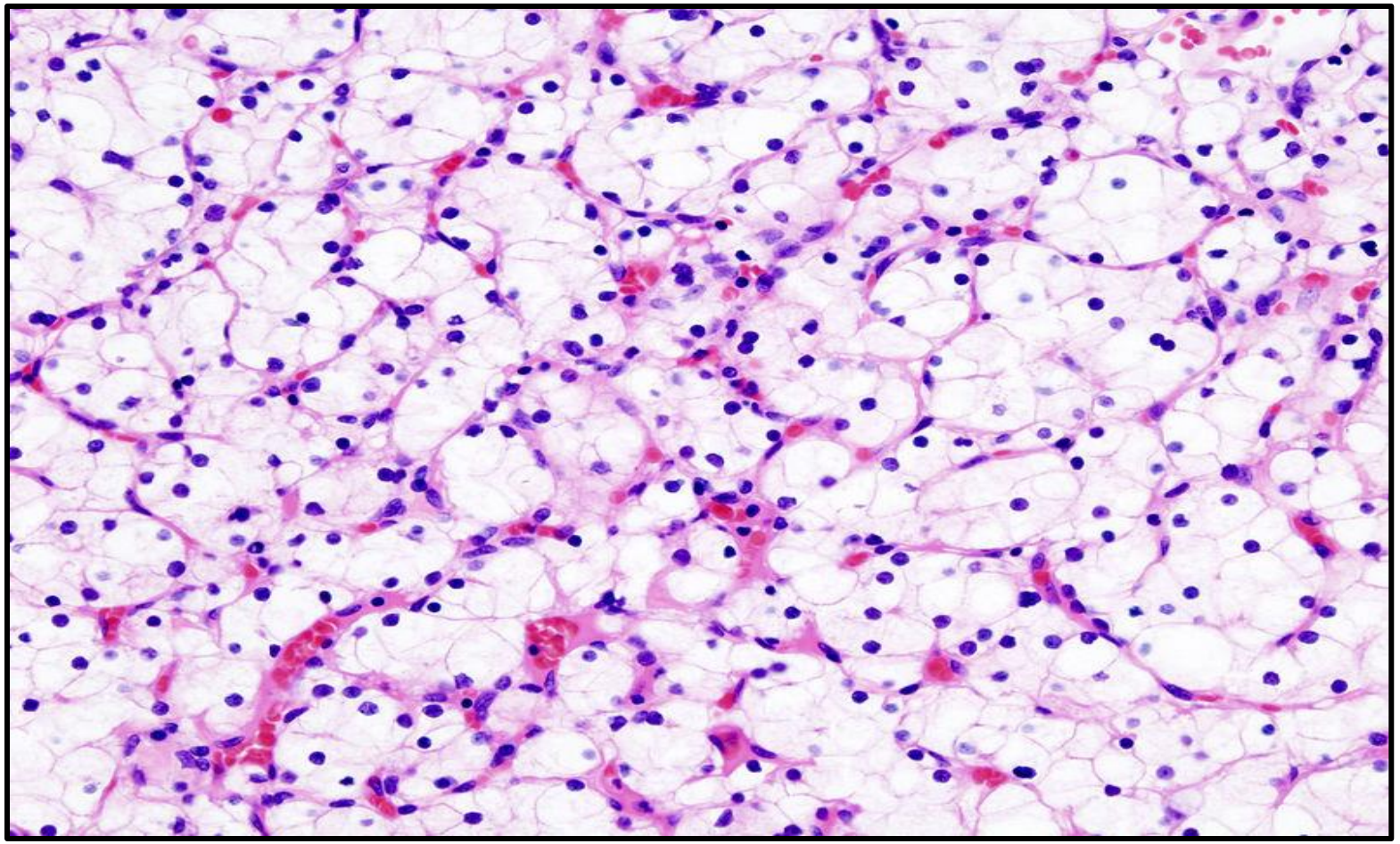
- *Tumor cells are large polygonal with clear cytoplasm (dissolved glycogen and lipid) and piknotic nuclei.*
- *Cells are arranged as alveolar groups or tubules with papillary formations separated by thin fibrovascular septae.*
- *Cells show pleomorphism and mitosis.*
- *Areas of haemorrhage and necrosis are present.*
- **Gene which may be responsible for this condition:**
  VHL gene on chromosome 3.

Renal Clear Cell Carcinoma - Histopathology



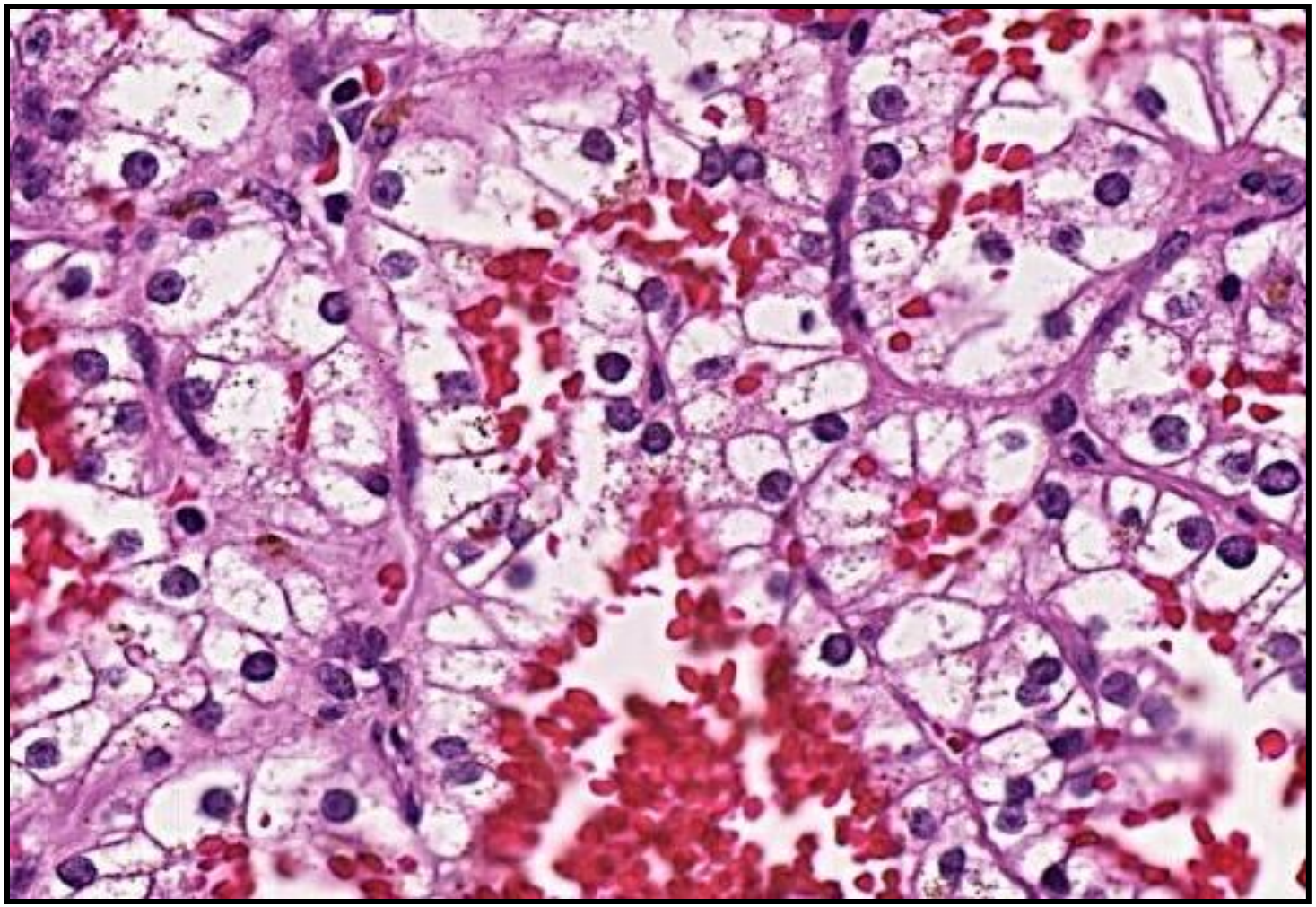
The most common type of renal cell carcinoma (clear cell) - on right of the image : Cells with clear cytoplasm, typically arranged in nests and Nuclear atypia is common. Non-tumour kidney is on the left of the image

Renal Clear Cell Carcinoma - Histopathology



The most common type of renal cell carcinoma (clear cell) .
Tumor cells are large polygonal with clear cytoplasm
(dissolved glycogen and lipid) and piknotic nuclei.
- Cells show pleomorphism and mitosis.

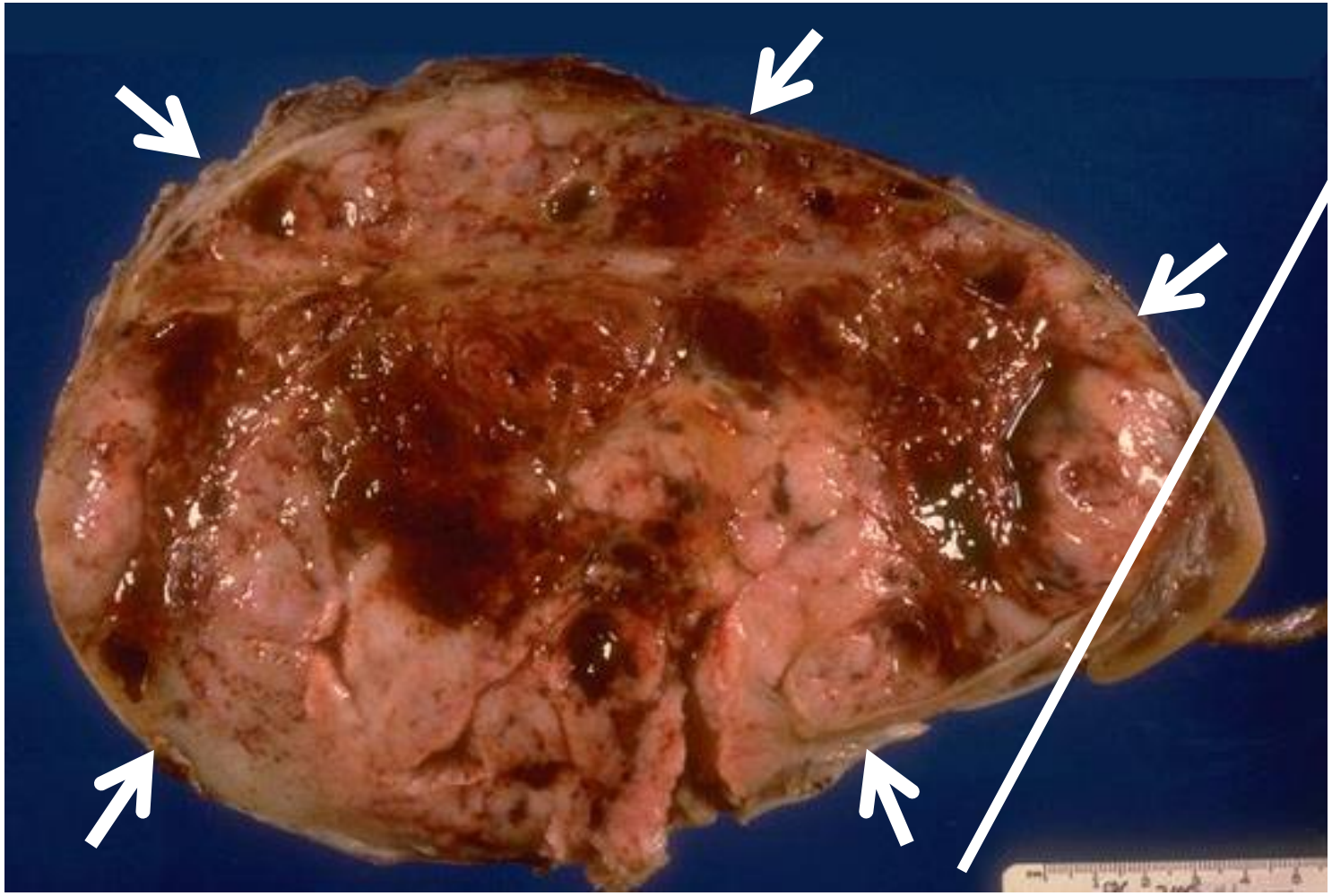
Renal Clear Cell Carcinoma - Histopathology



Areas of haemorrhage.
Clear tumor cells.
Pleomorphic nuclei.

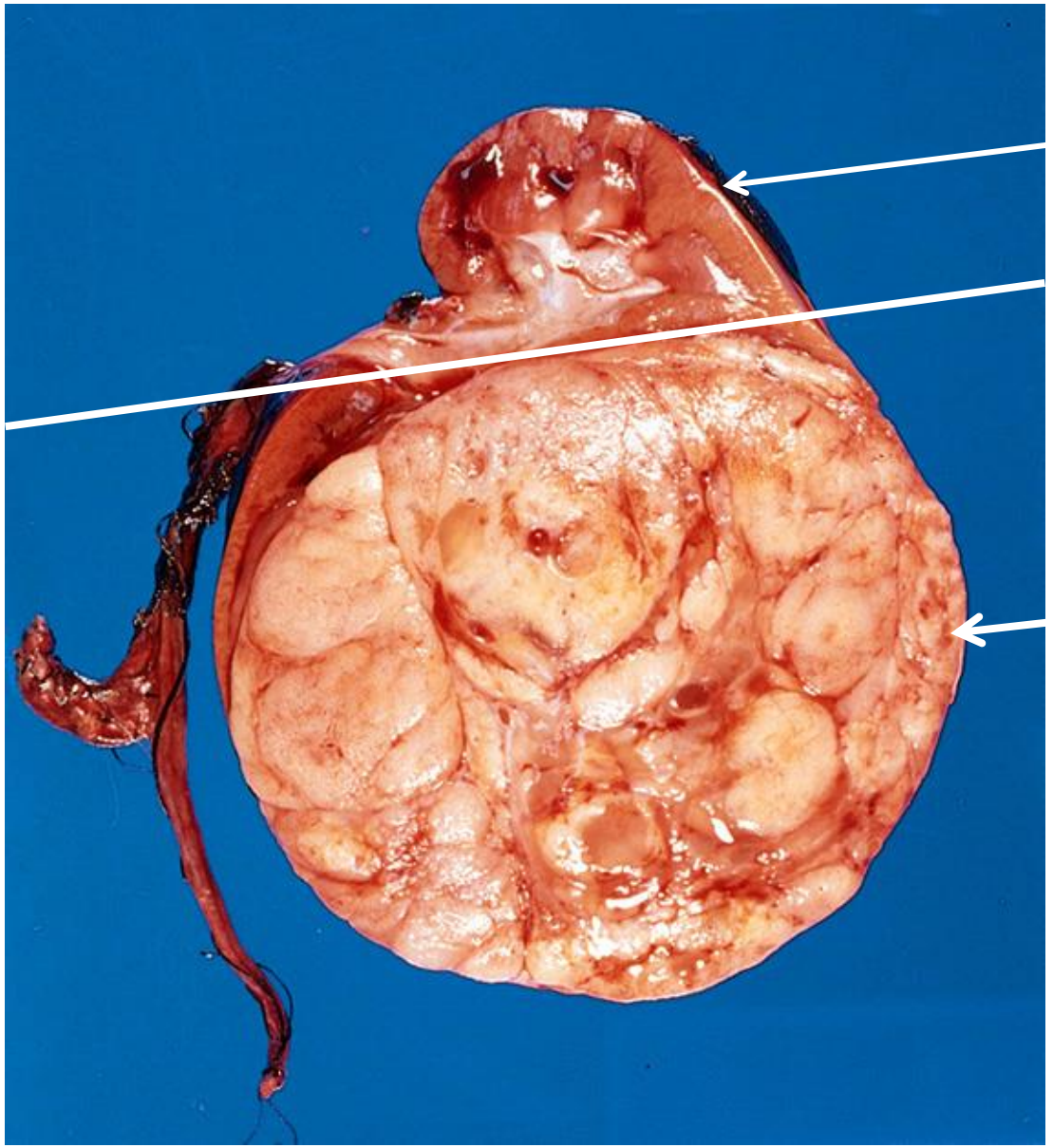
WILM'S TUMOR

Wilm's Tumor – Gross Pathology

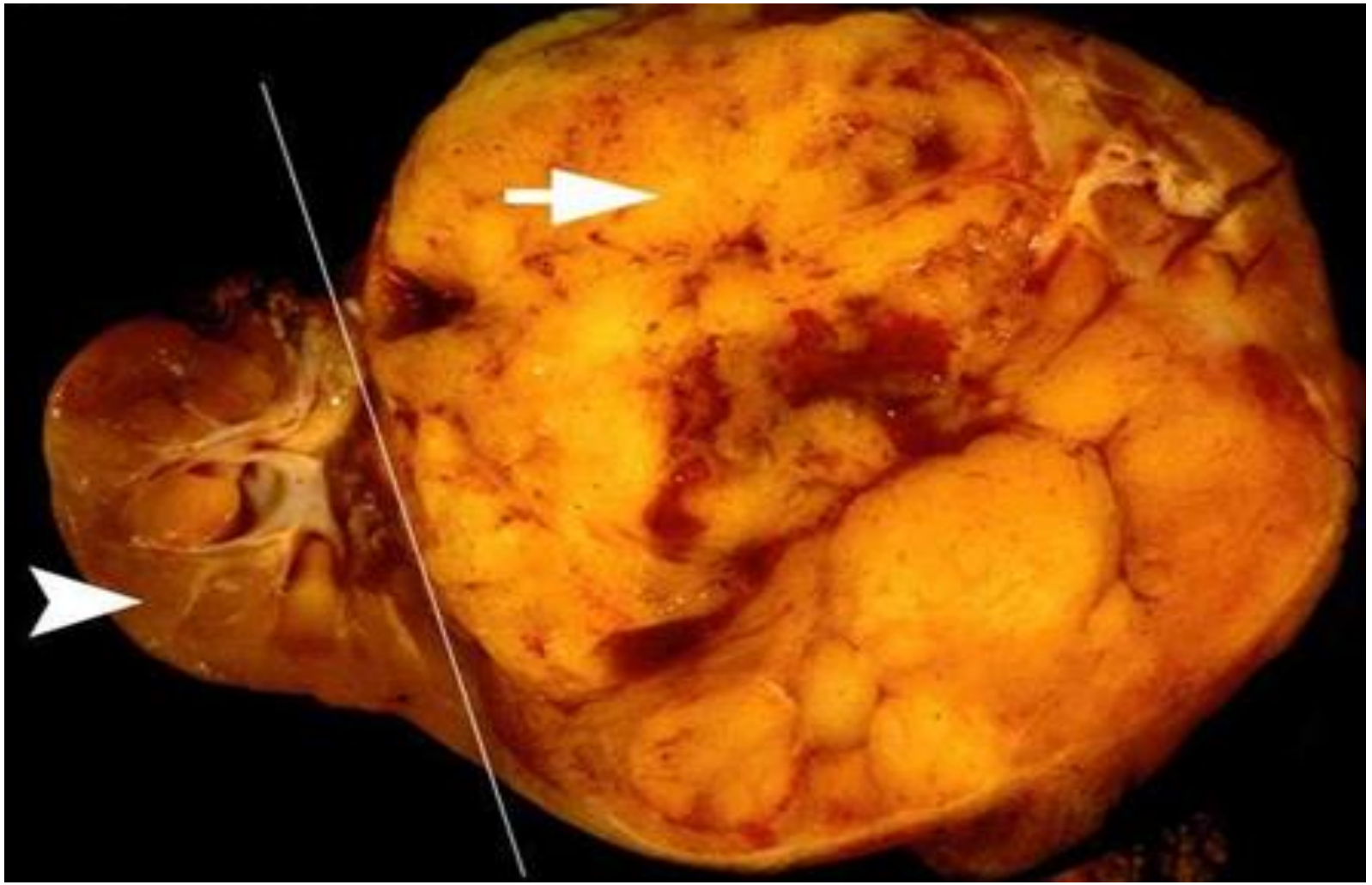


Gross picture shows partly pale and partly hemorrhagic solid tumor replacing almost the entire renal parenchyma and areas of necrosis also seen .

Wilm's Tumor – Gross Pathology

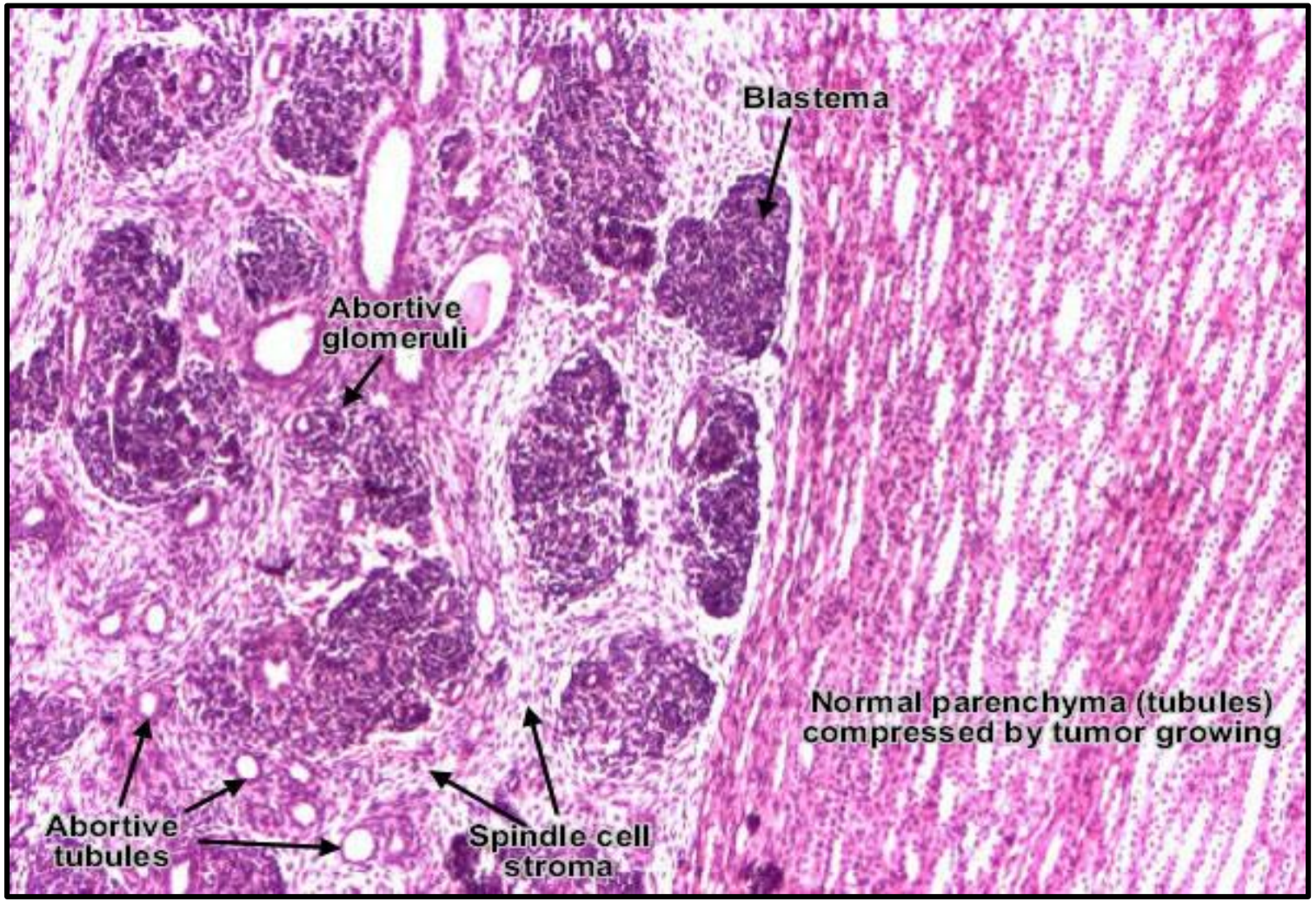


Wilm's Tumor – Gross Pathology



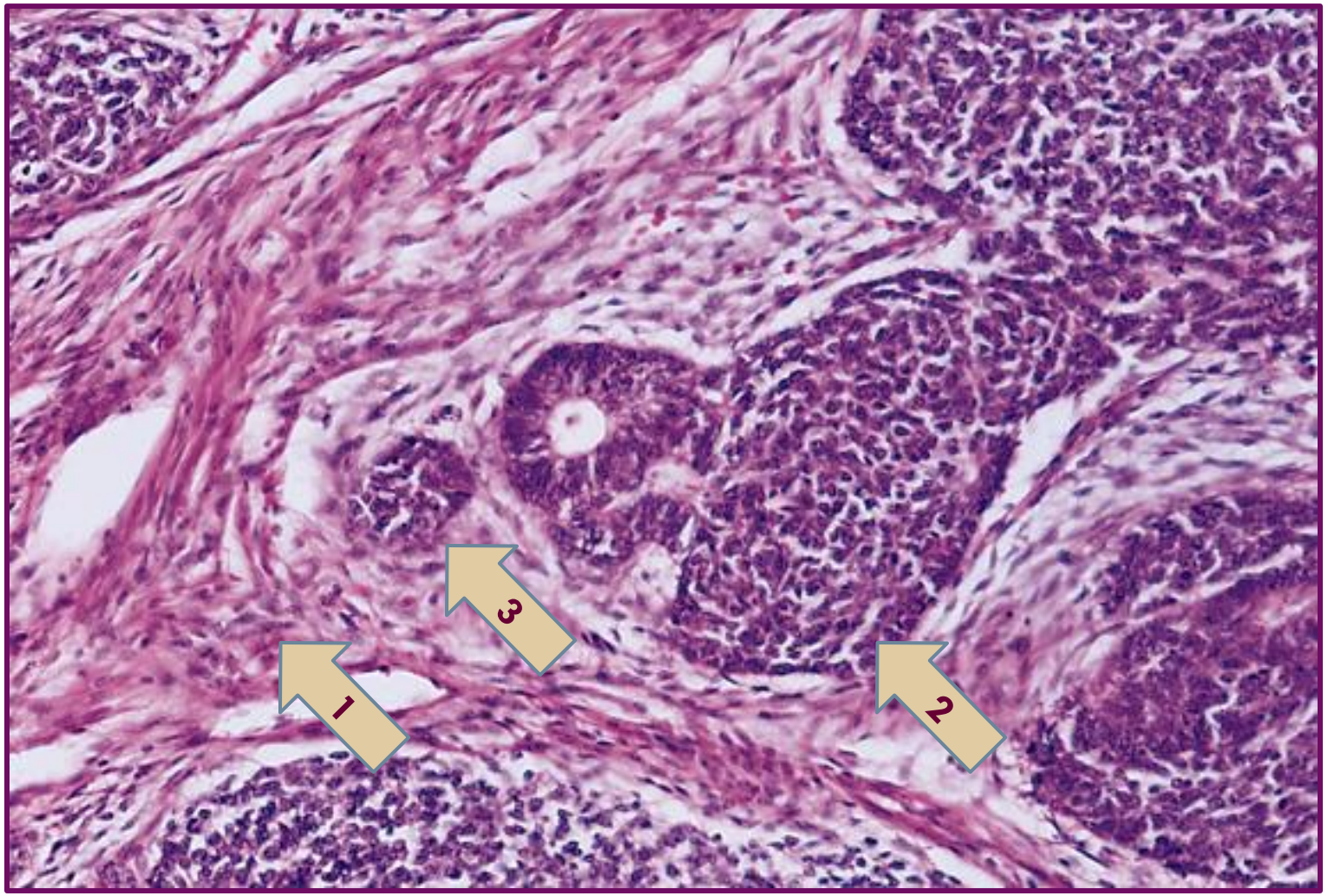
Gross picture shows partly pale and partly hemorrhagic solid tumor replacing almost the entire renal parenchyma and areas of necrosis also seen .

Wilm's Tumor – Histopathology



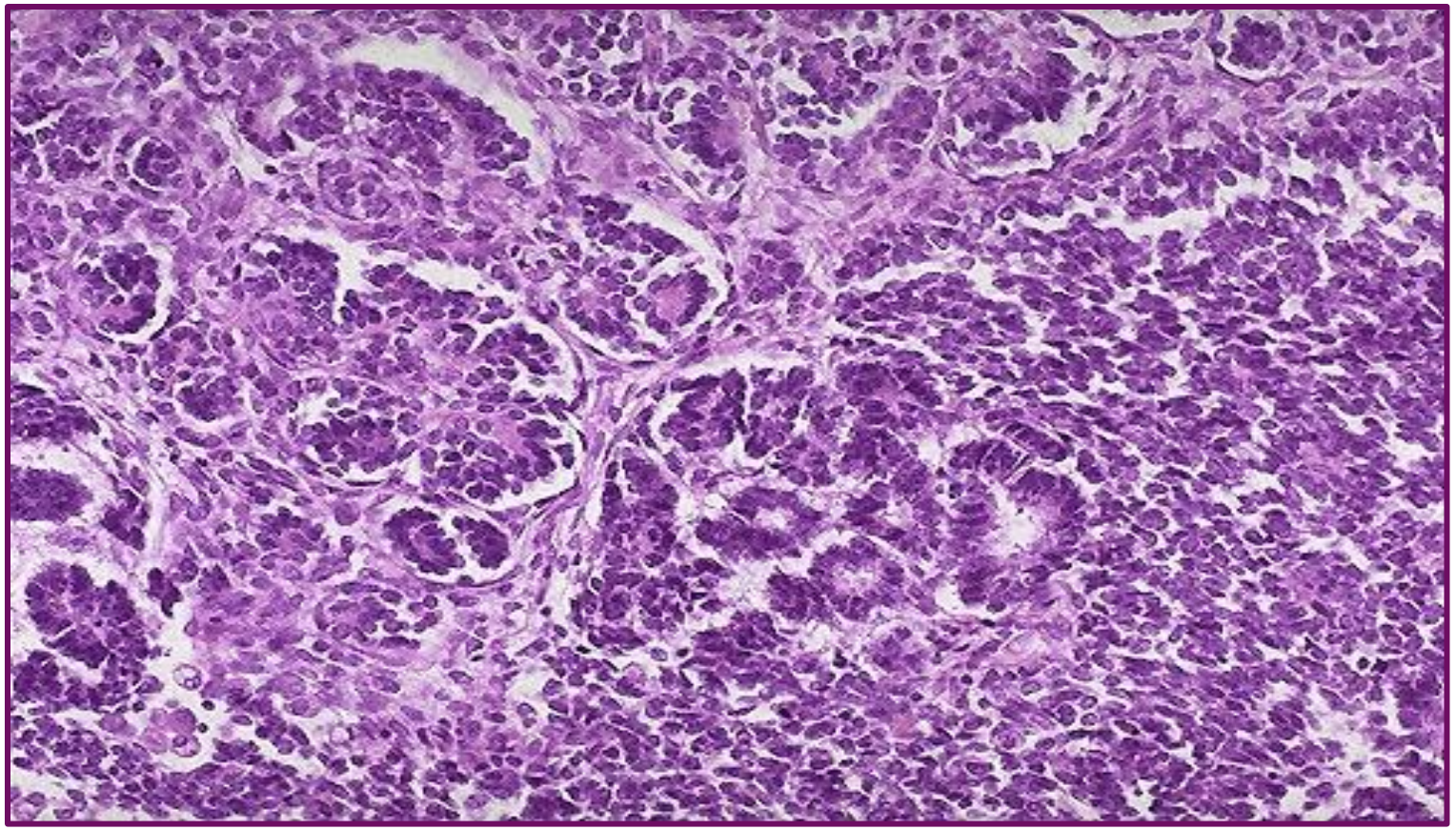
Blastema in WT consists of sheets of densely packed small blue cells with hyperchromatic nuclei, little cytoplasm and conspicuous mitotic activity.

Wilm's Tumor – Histopathology



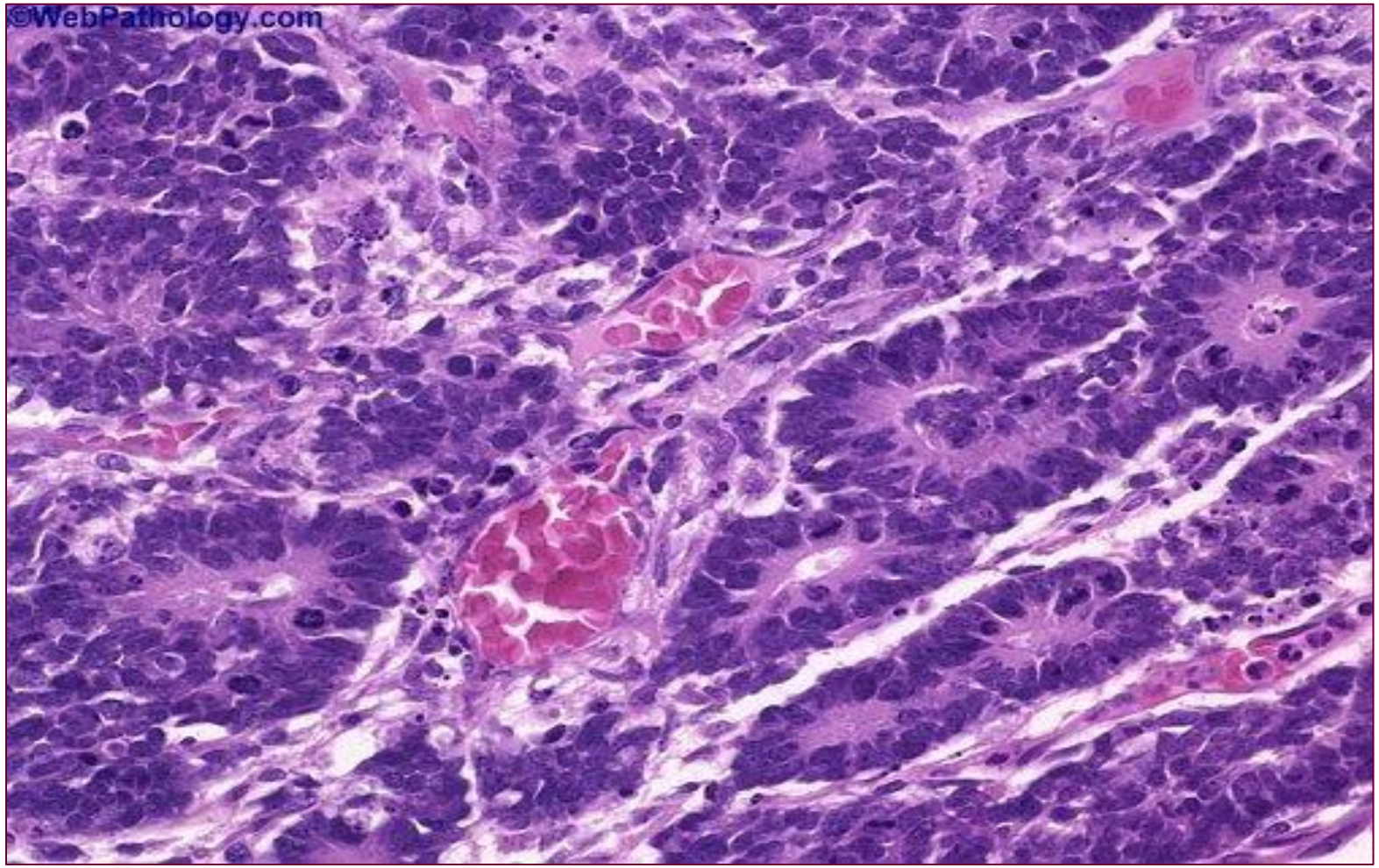
1. Spindle cell stroma.
2. Blastema.
3. Abortive glomeruli.

Wilm's Tumor – Histopathology



Wilm's tumor resembles the fetal nephrogenic zone of the kidney.
Three major components: Undifferentiated blastema cells , epithelial tissue which shows attempts to form primitive glomerular & tubular structures and mesenchymal (stromal) tissue

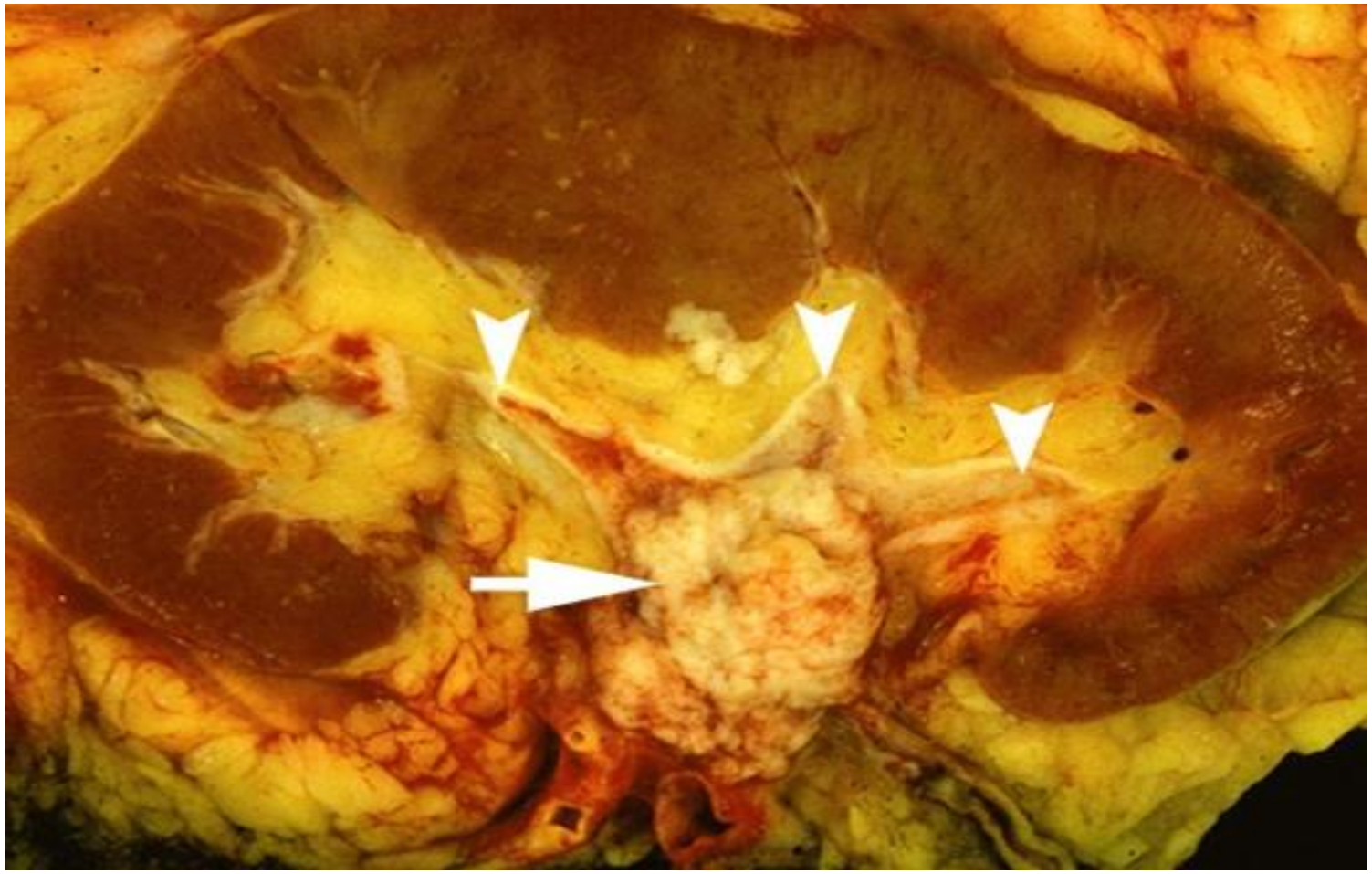
Wilm's Tumor – Histopathology



The epithelial component in this Wilm's tumor consists of primitive cuboidal cells forming tubular structures and rosettes.

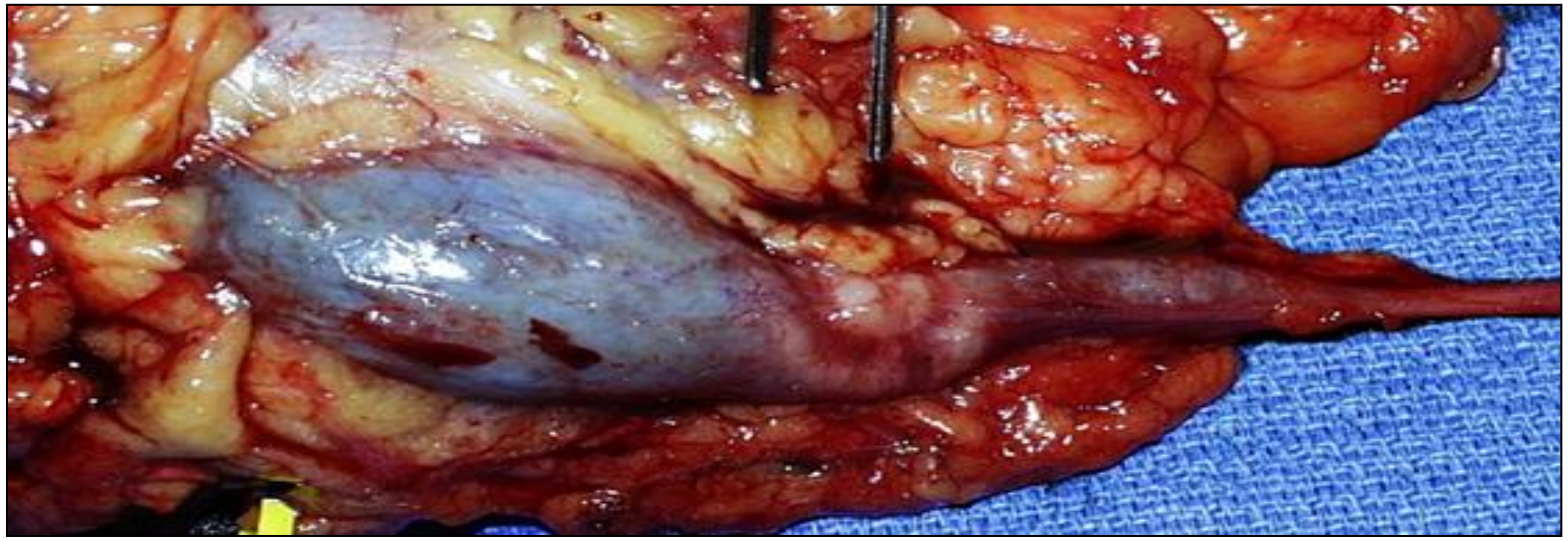
CARCINOMA OF RENAL PELVIS AND URETER

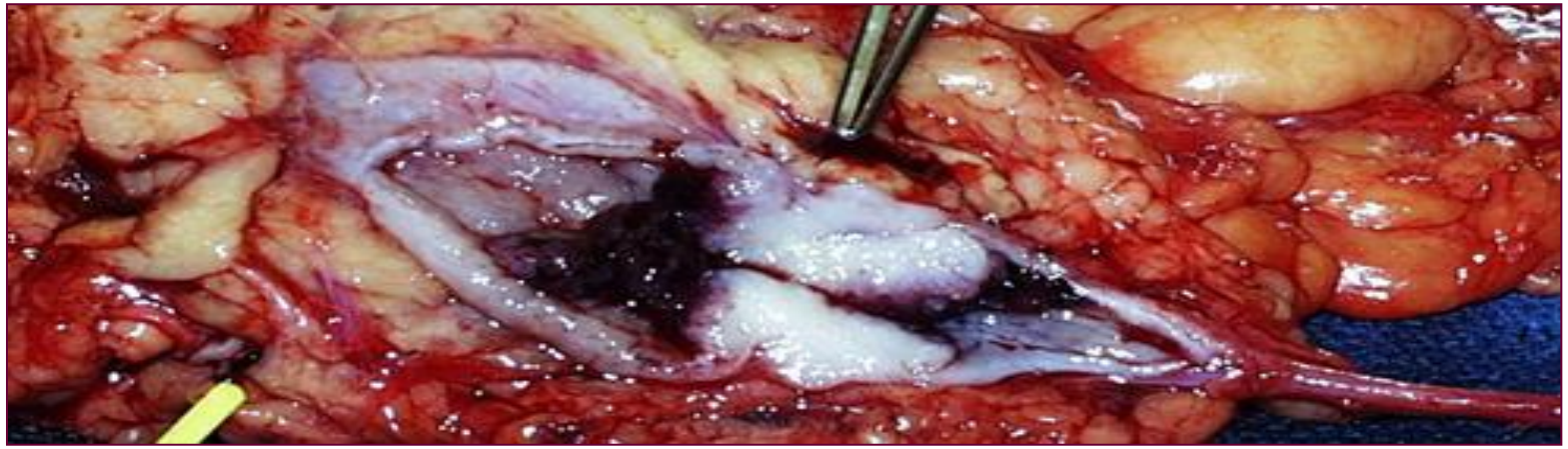
Urothelial (Transitional) Carcinoma of Renal Pelvis



More commonly infiltrative and prognosis is more worse than urothelial carcinoma of the bladder

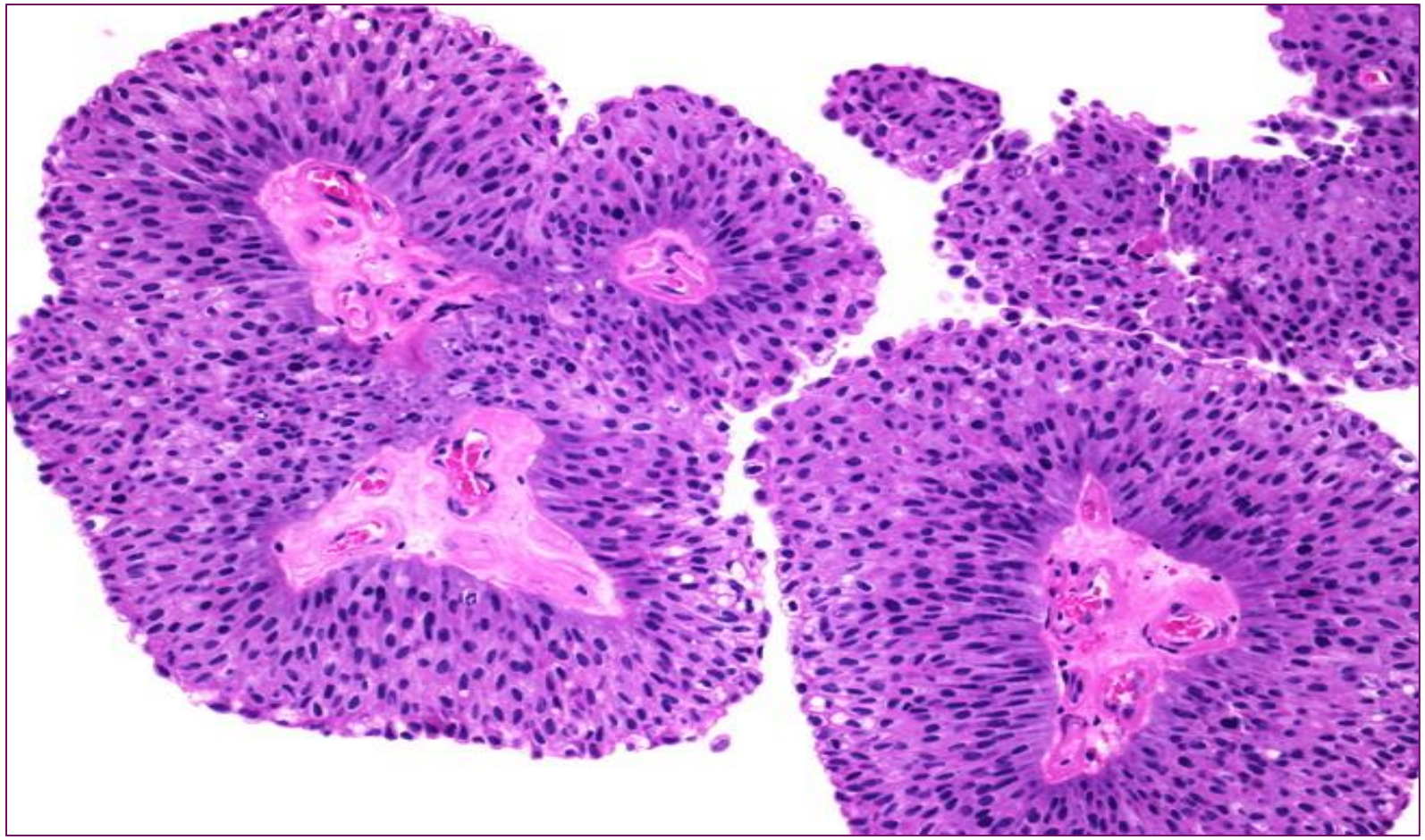
Urothelial Carcinoma involving Ureter - Gross





A nephroureterectomy specimen showing bulbous expansion of proximal ureter near the renal pelvis caused by papillary urothelial carcinoma

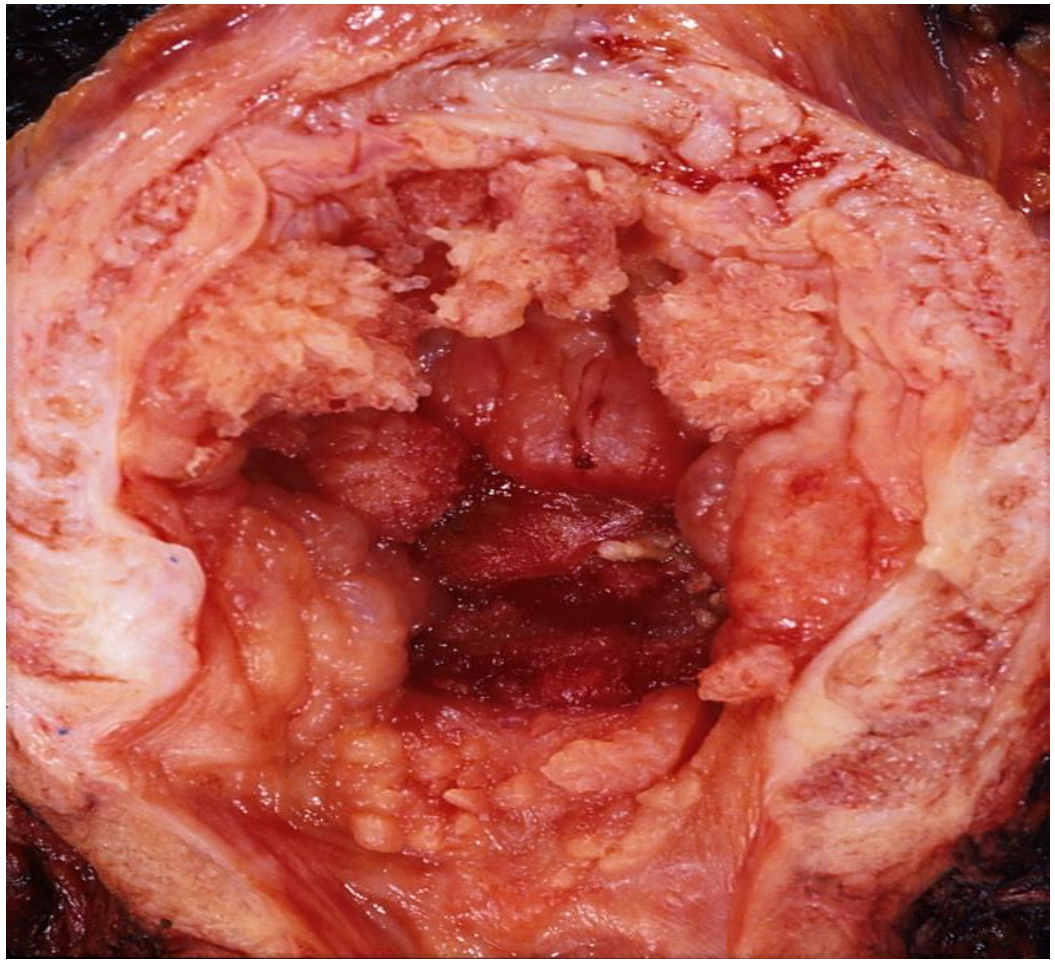
Papillary Urothelial carcinoma of the renal pelvis – Low Grade



Low-grade papillary urothelial carcinoma shows minimal cytologic and architectural atypia. Adjacent papillary fronds may fuse, as seen in this image

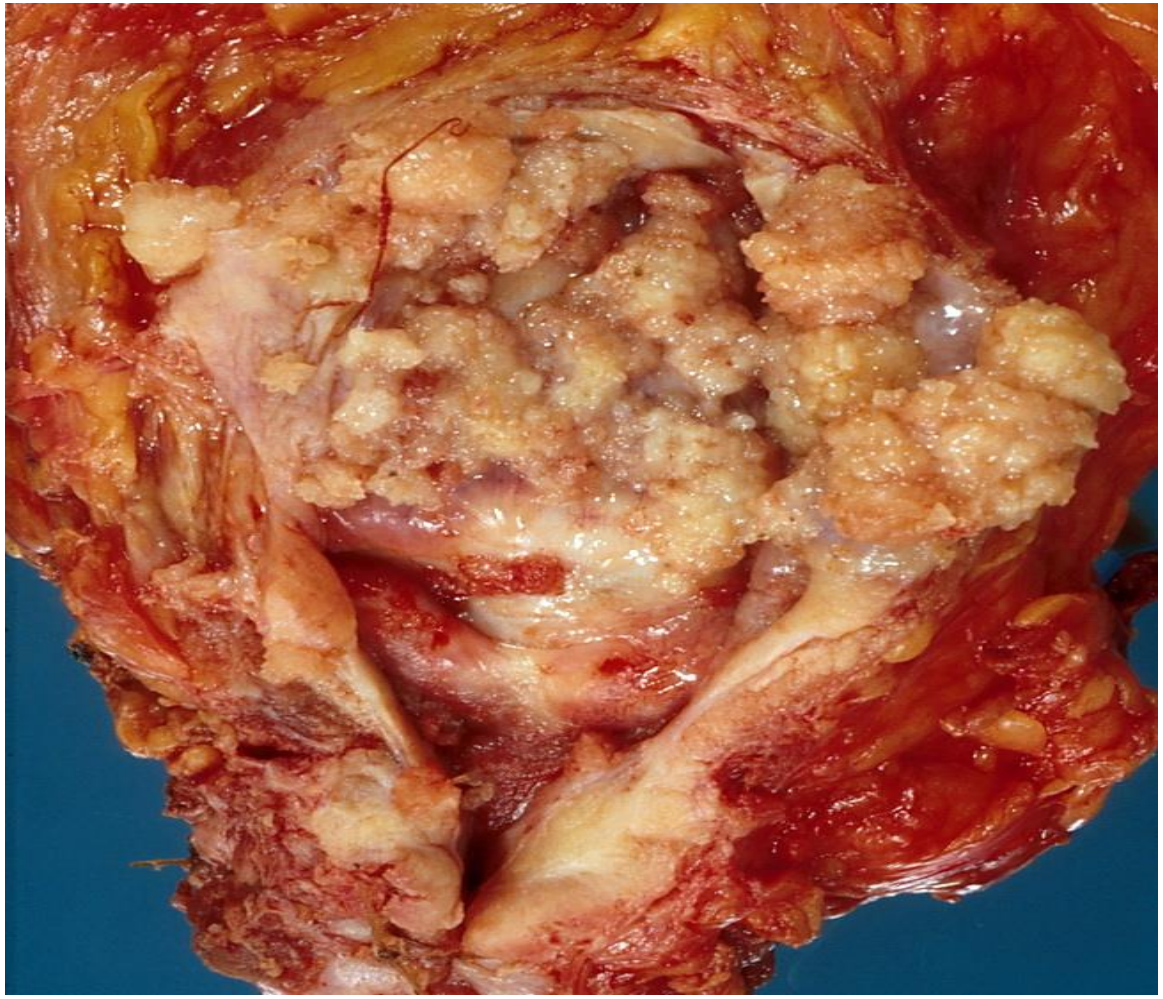
CARCINOMA OF THE URINARY BLADDER

Urinary Bladder Carcinoma - Urothelial (Transitional cell) papillary Carcinoma - Gross



90% of bladder cancers are transitional cell carcinoma.
The other 10% are squamous cell carcinoma, adenocarcinoma, sarcoma, small cell carcinoma, and secondary metastases

Papillary Urothelial Carcinoma of Bladder - Gross

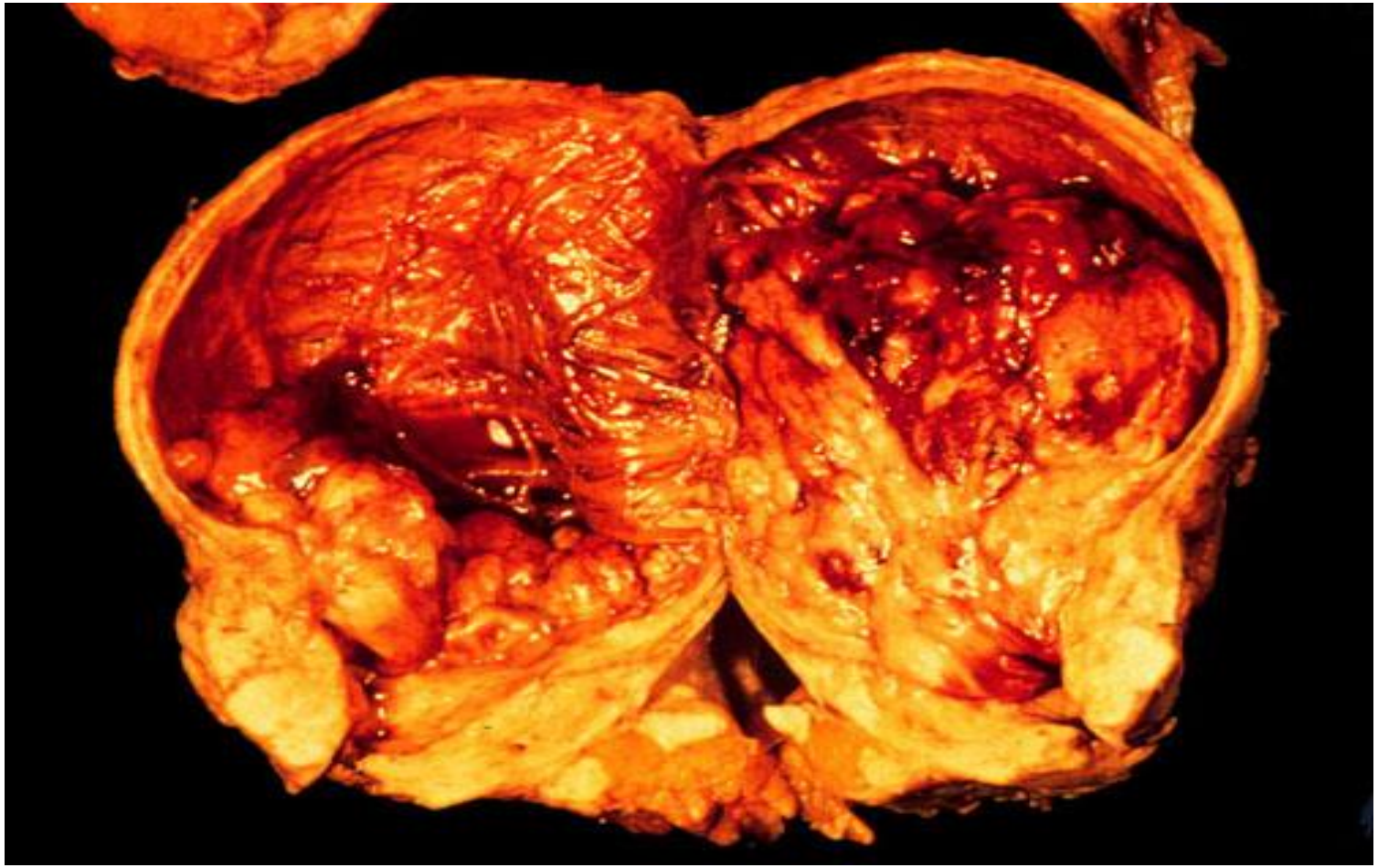


Bladder showing multifocal papillary mucosal neoplasm.

Risk factors for the development of papillary urothelial carcinoma of bladder:

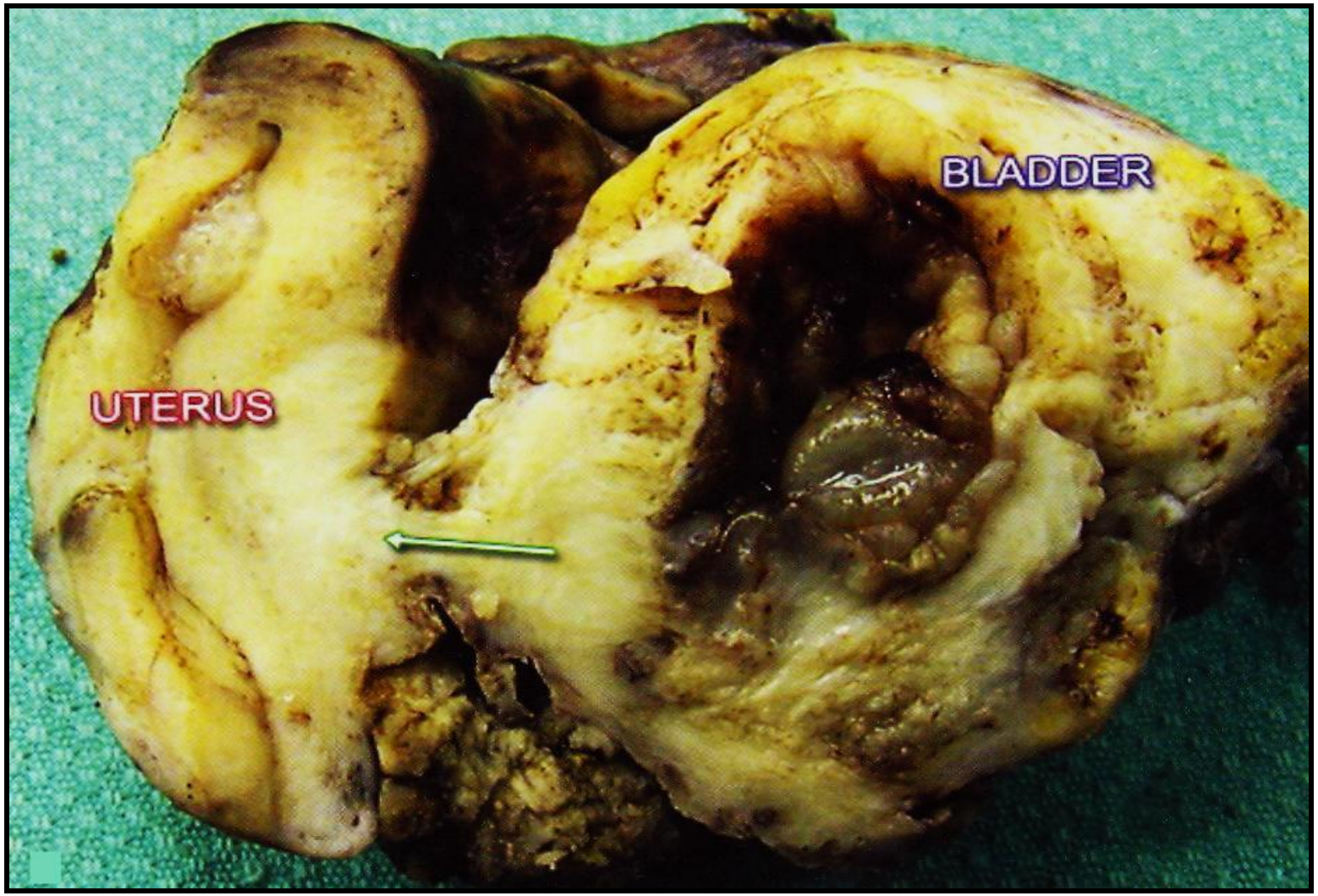
a- Exposure to aniline dyes.
b- Cigarette smoking.
c- Treatment with cyclophosphamide.
d- Schistosoma haematobium infestation.
e- Persistent urachus.

Transitional Carcinoma of Bladder - Gross



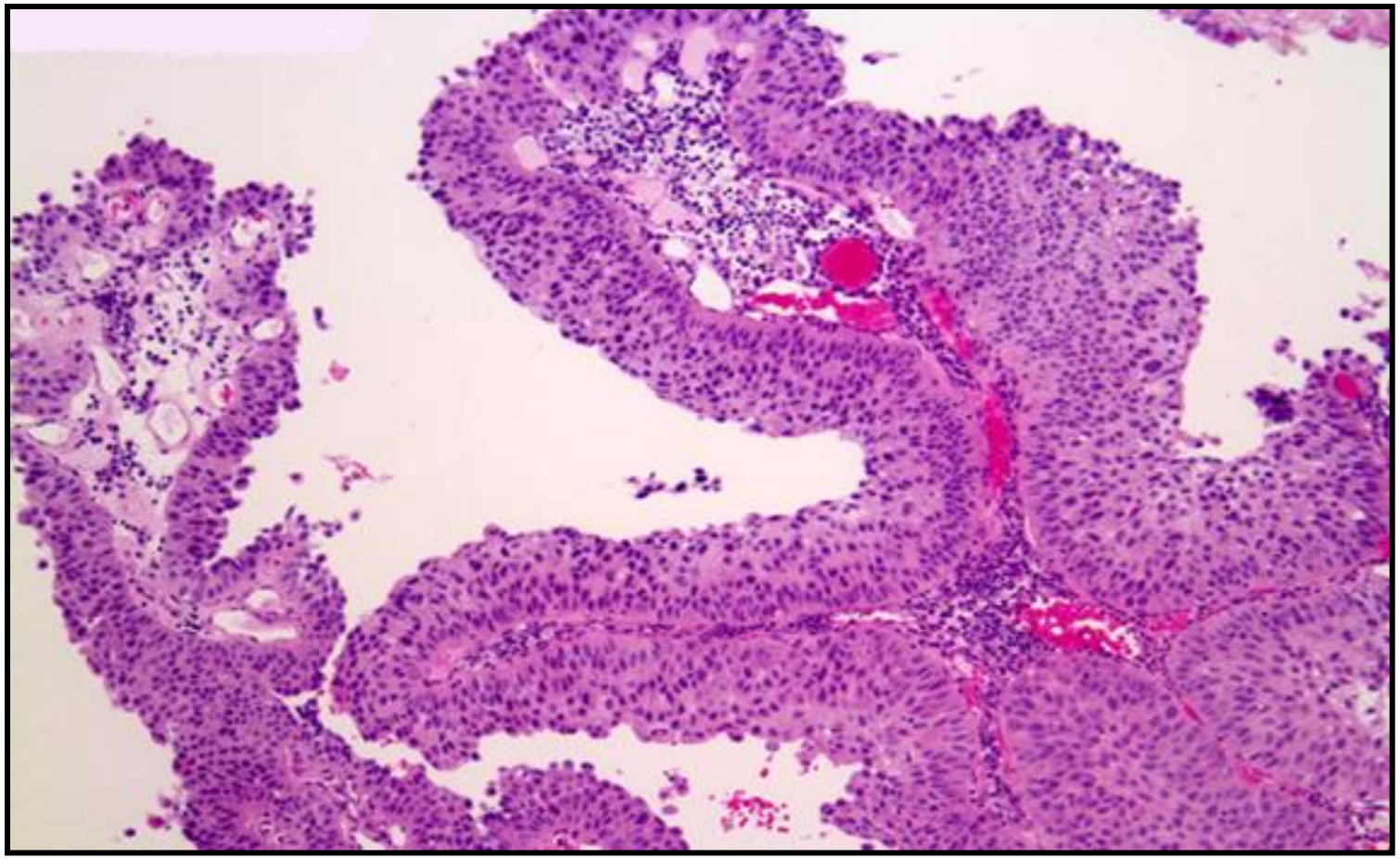
The mucosa of the open urinary bladder appears edematous. There are several whitish or red nodules and patches indicative of a multi-focal nature of this tumor

Bladder Tumor invading the Uterus – Gross



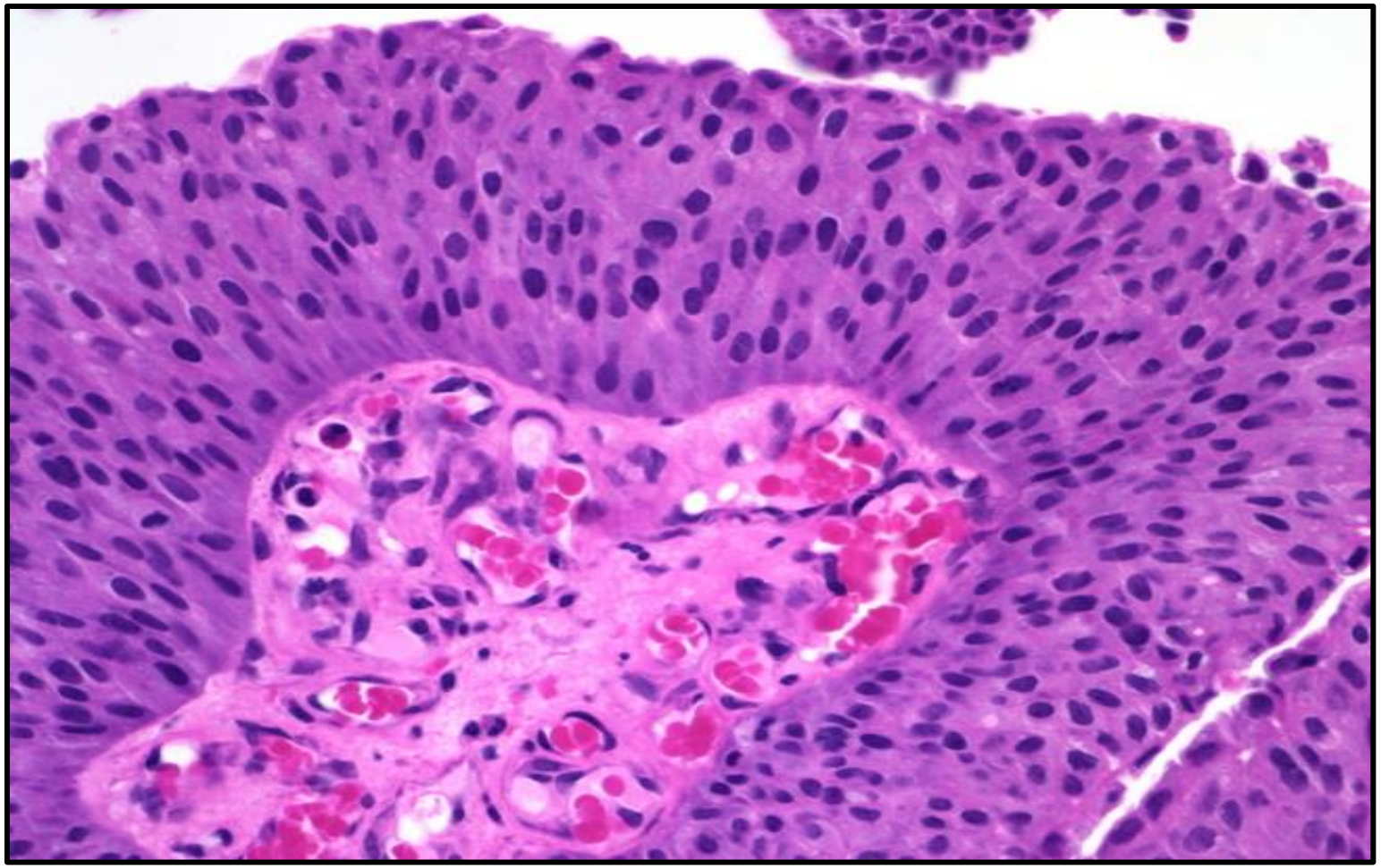
Urinary bladder carcinoma infiltrating the urinary bladder wall with extension to the uterus .

Papillary Urothelial carcinoma – Low Grade



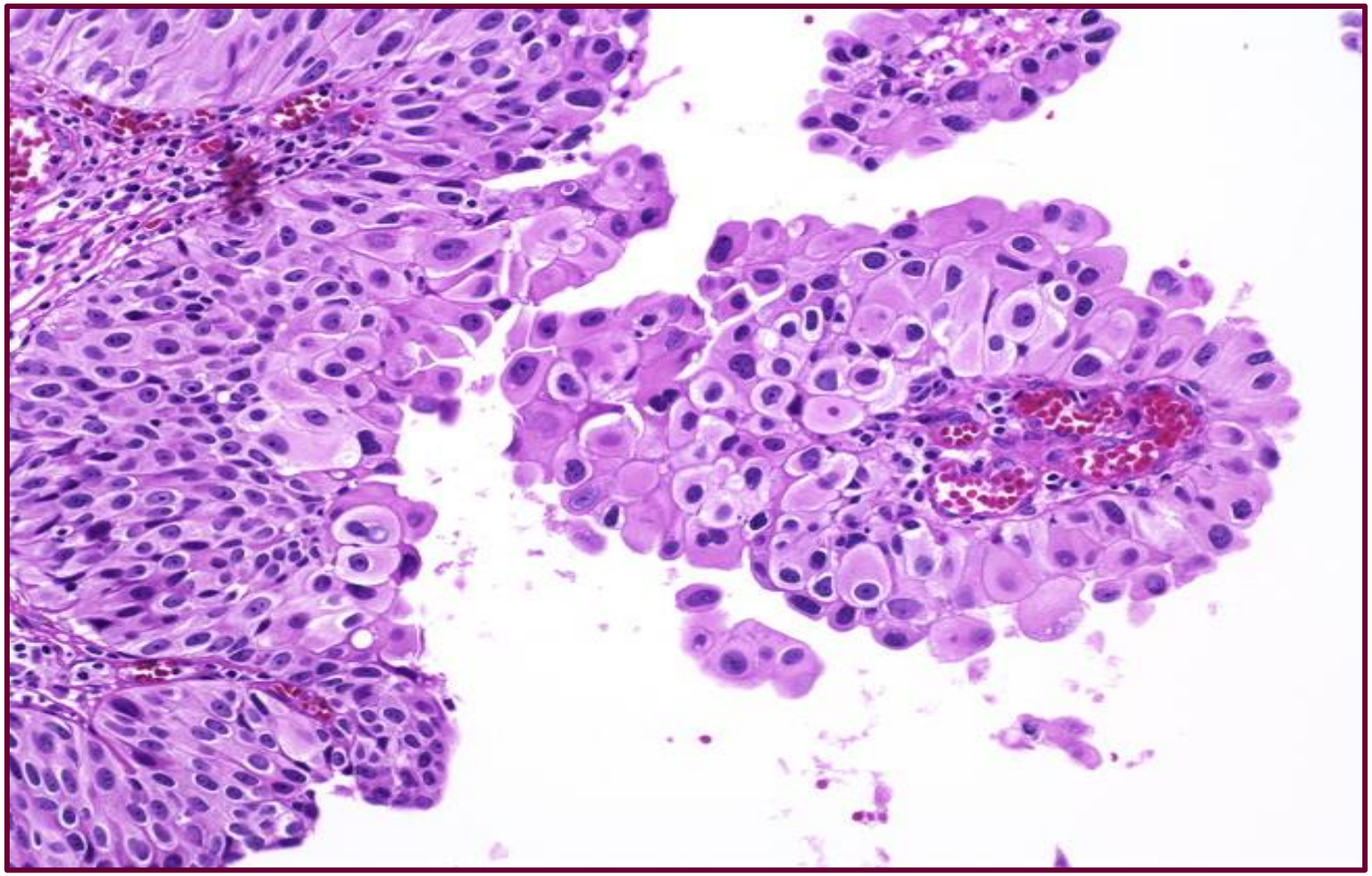
The low grade tumors show overall preservation of cell polarity, few mitoses, and lack of significant morphologic atypia. This exophytic papillary tumor shows multiple finger-like projections lined by multiple layers of urothelium (transitional epithelium)

Papillary Urothelial Carcinoma – Low Grade



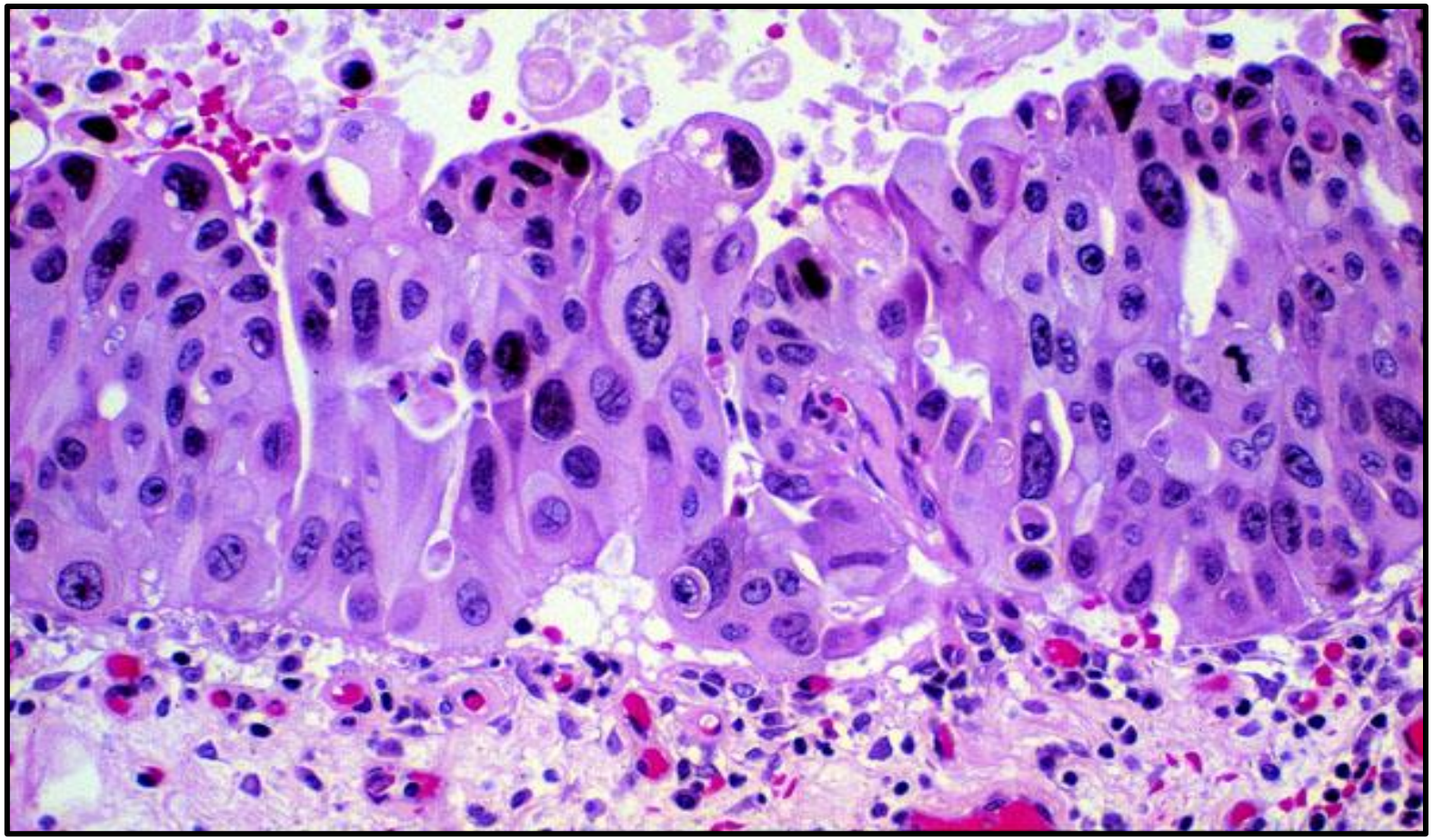
High power view of a low-grade papillary urothelial carcinoma. There are scattered hyperchromatic nuclei and typical mitotic figures

Papillary Urothelial carcinoma – High Grade



This high-grade papillary urothelial carcinoma shows highly pleomorphic and hyperchromatic nuclei with voluminous cytoplasma.

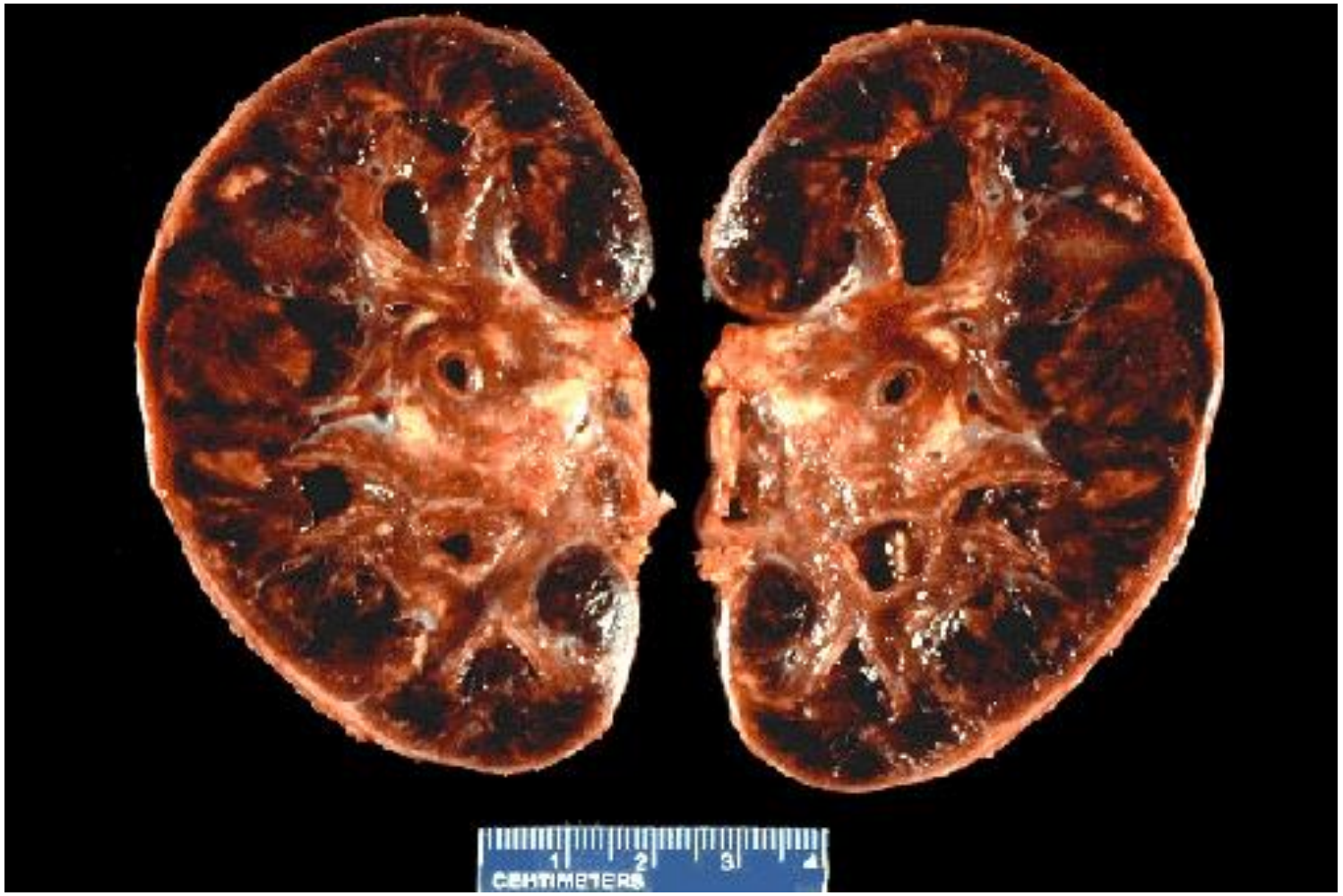
Urothelial (Transitional) carcinoma – HPF



Almost all cases of Bladder carcinomas are originating from the transitional epithelium. Bladder carcinoma might be squamous cell in nature. Chronic inflammation of the bladder mucosa, caused by stones or schistosomiasis may lead to it . Rarely, it presents as adenocarcinoma

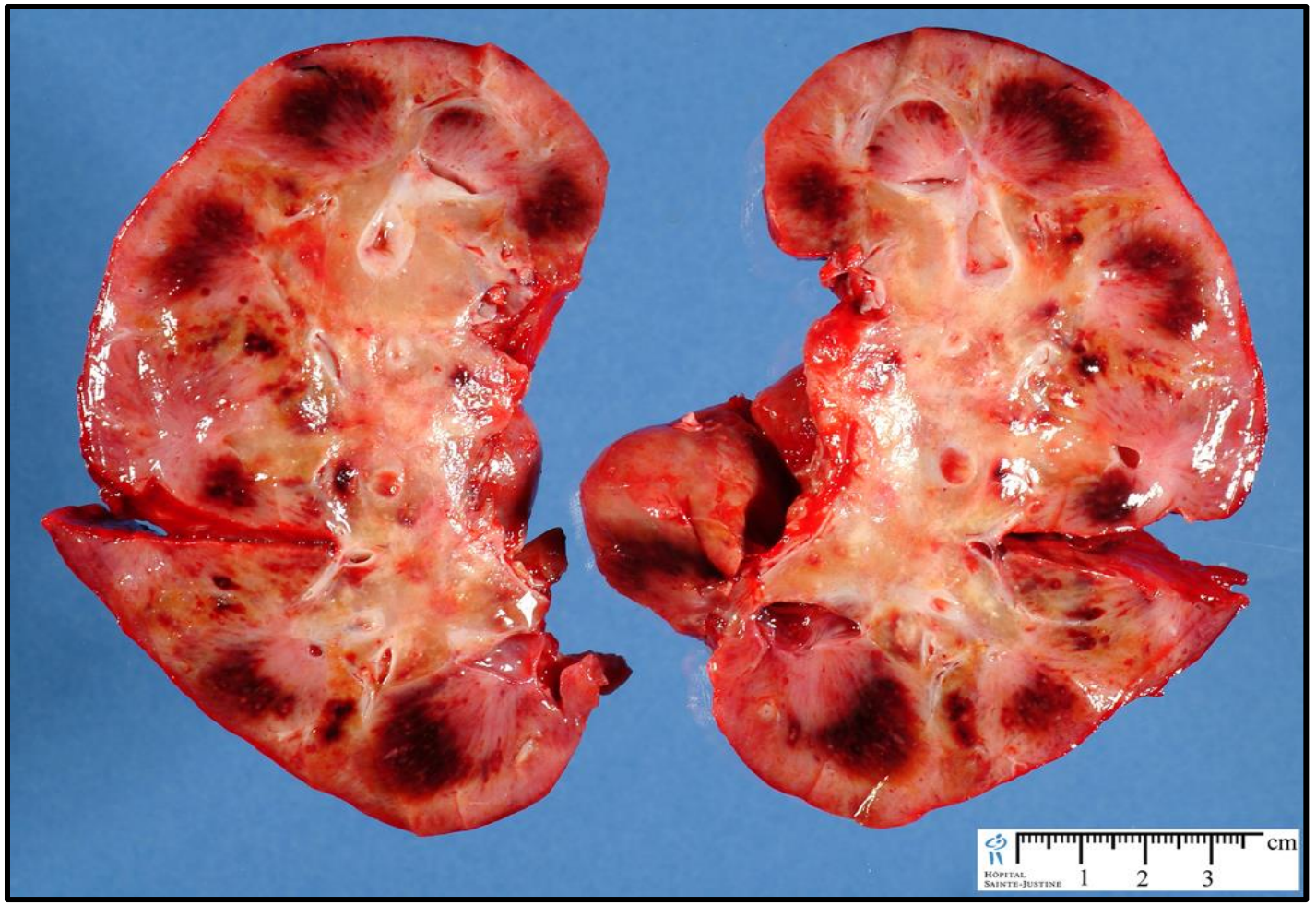
PATHOLOGY OF RENAL ALLOGRAFT

Acute Cellular Allograft Rejection



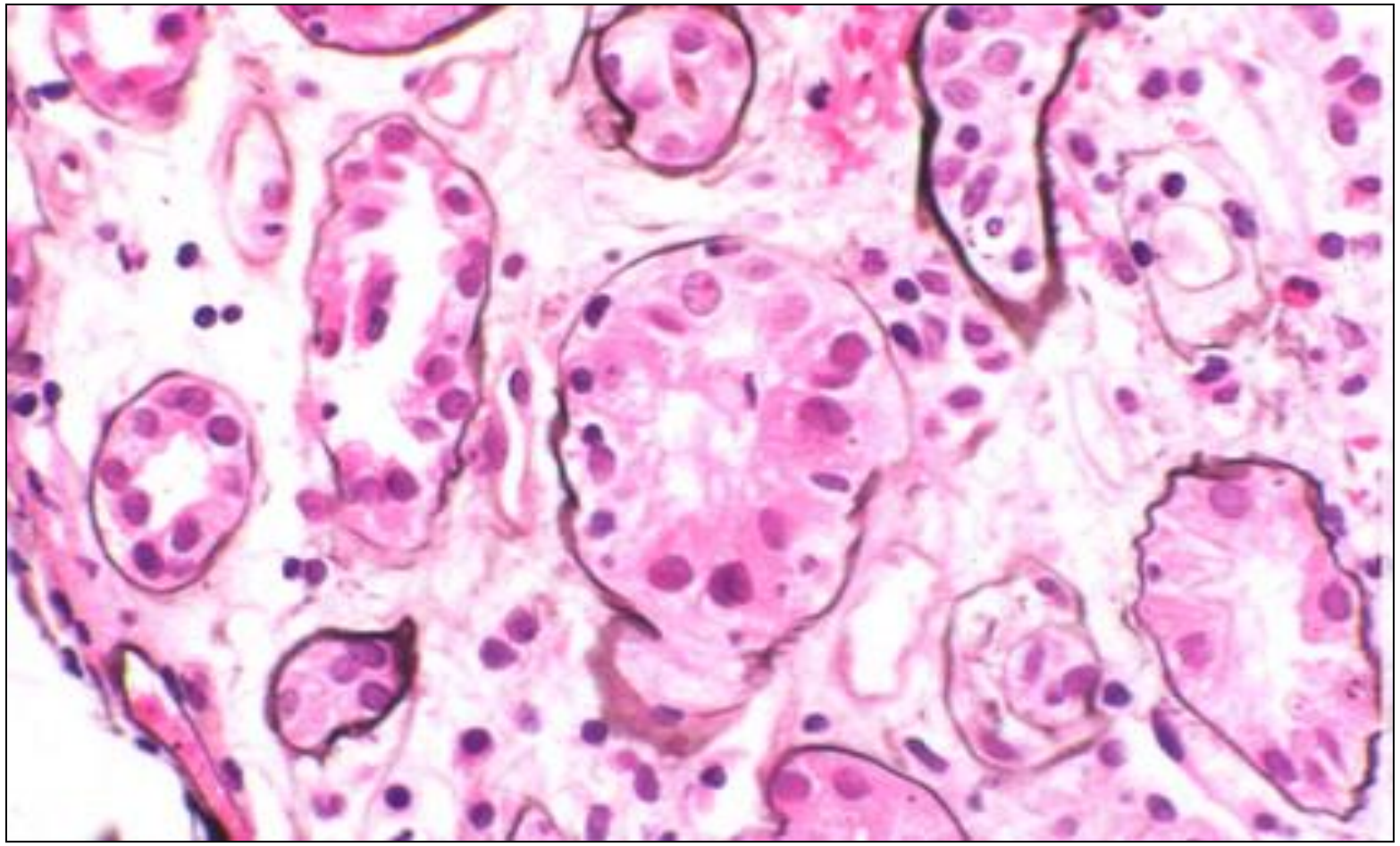
This kidney was removed because of acute transplant rejection. Note the swollen and hemorrhagic appearance of this entire kidney.

Acute Cellular Allograft Rejection



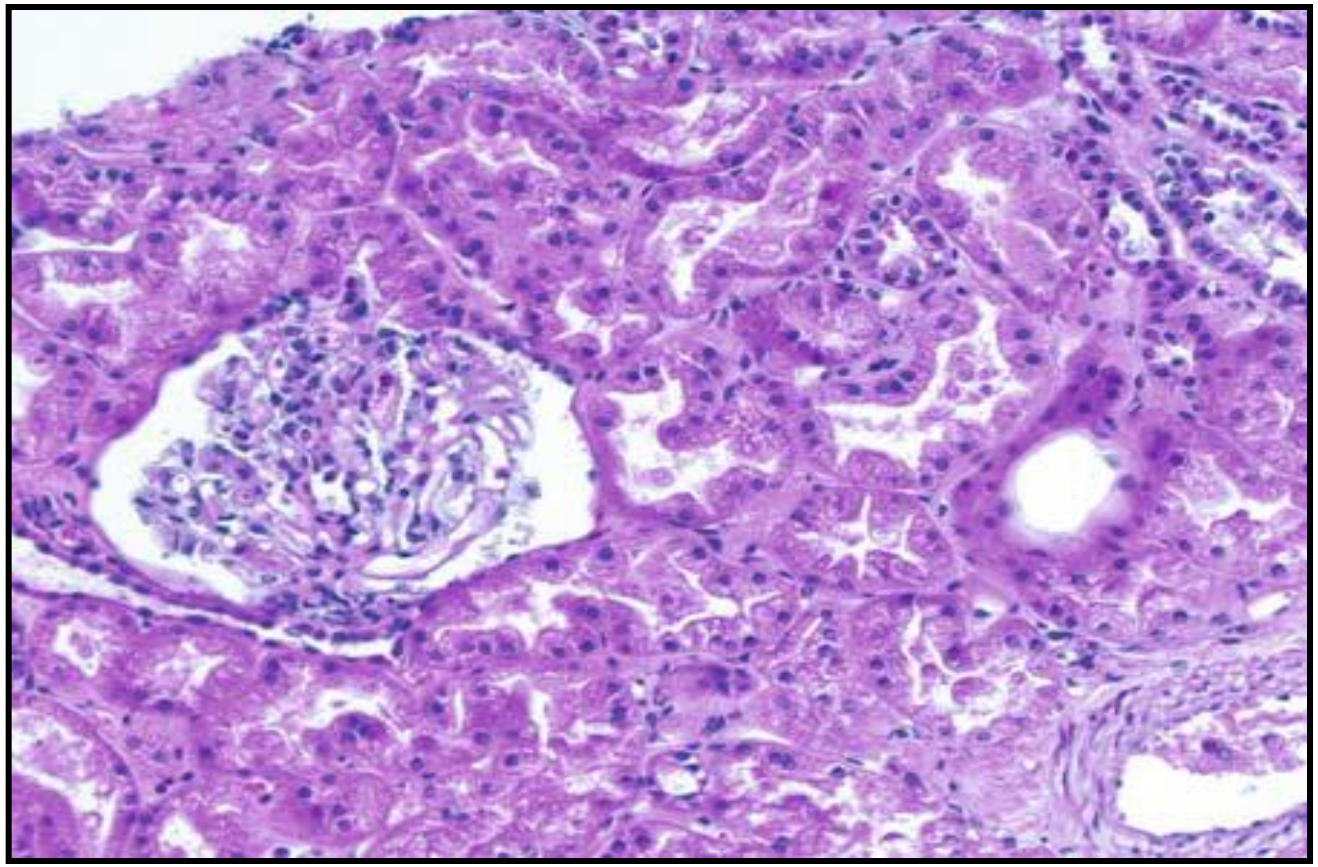
Swollen and hemorrhagic appearance of acutely rejected renal allograft

Acute Cellular Allograft Rejection – Type I



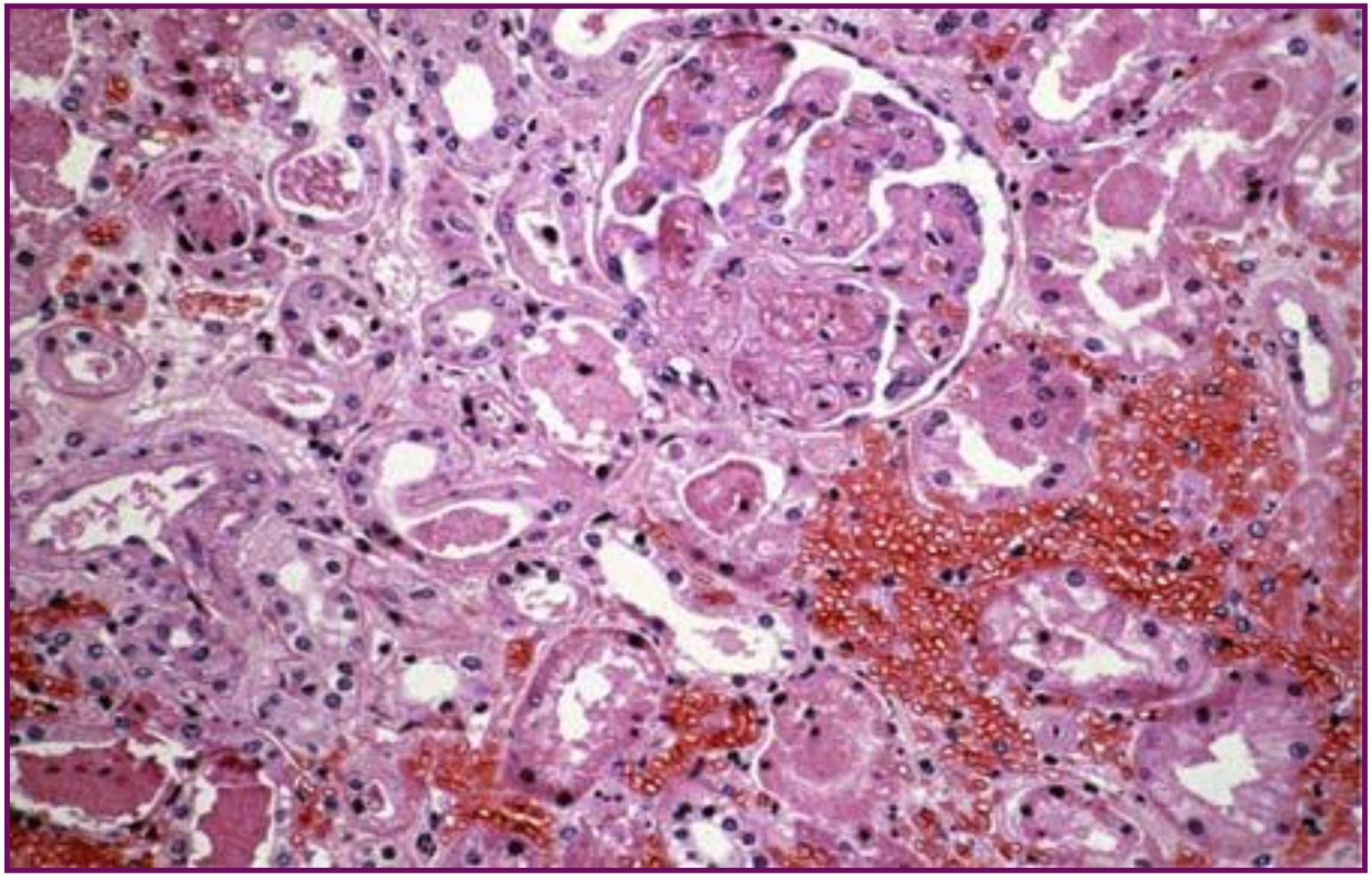
Tubulitis, ie, infiltration of tubular epithelium by lymphocytes, is the hallmark of type I interstitial acute rejection

Acute Humoral Rejection (AHR) – Type I



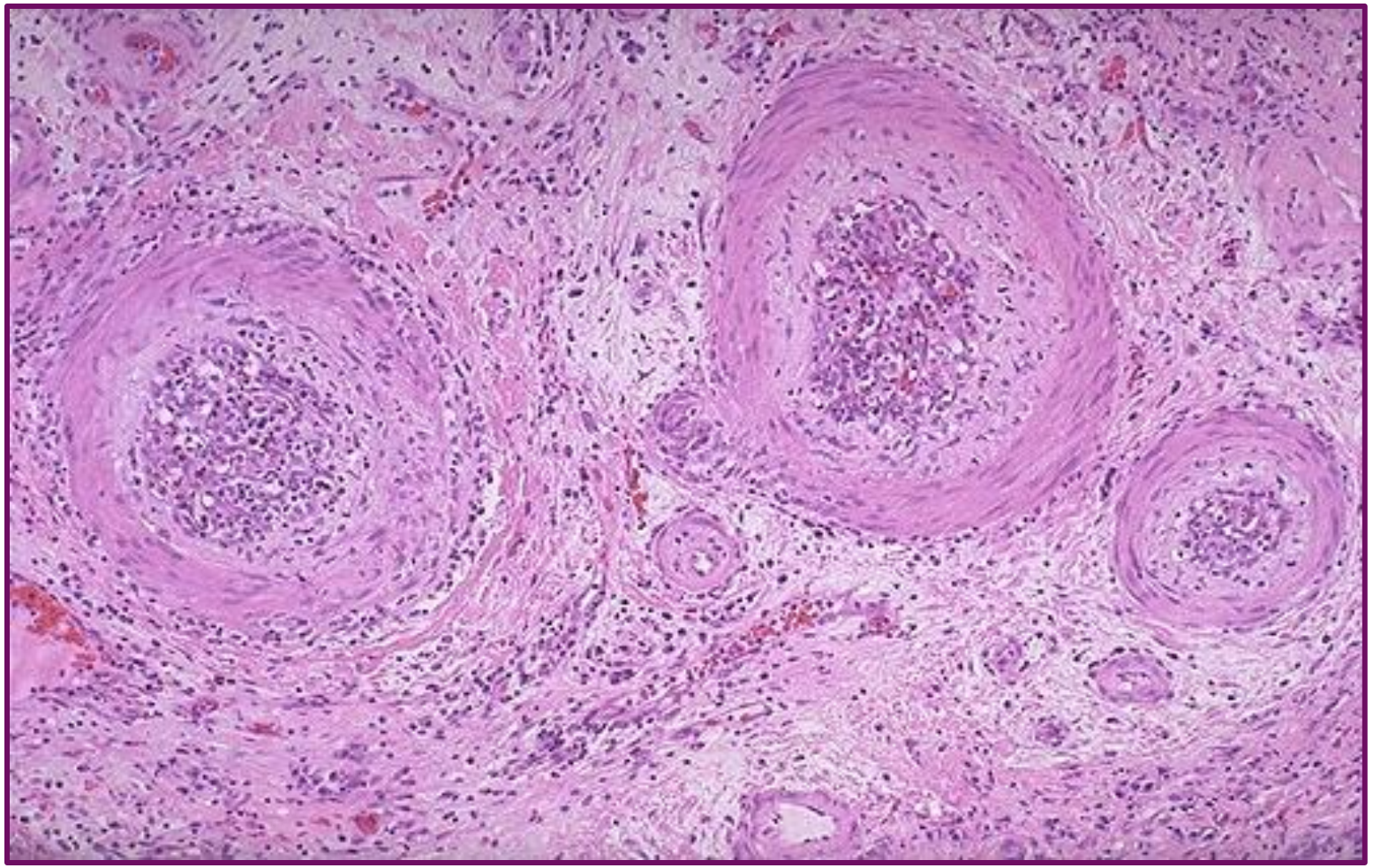
Humoral (Antibody-mediated) rejection, type I. Acute tubular injury is evident, without neutrophils in capillaries. Peritubular and glomerular capillary inflammation with neutrophils, and necrosis of arteries

Hyperacute Allograft Rejection



Hyperacute rejection. The cortex shows diffuse hemorrhage and neutrophils in peritubular capillaries with prominent glomerular thrombi 1 day after transplantation

Chronic Allograft Rejection



Chronic vascular rejection of a renal transplant, which has a poor prognosis. Note the thickened arteries with intimal fibrosis and also chronic inflammation.

THE END