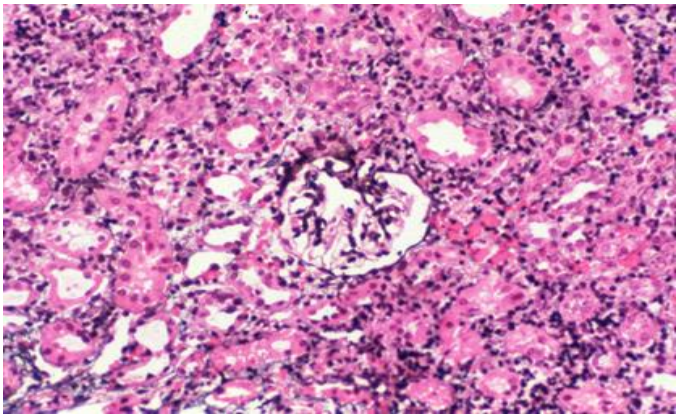
1- ACUTE KIDNEY INJURY

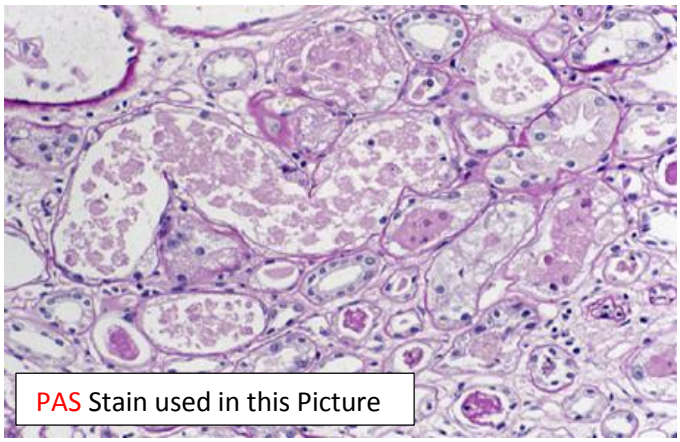
- Acute kidney injury is Rapid loss of kidney Function dominated by oliguria or anuria (no urine flow), and recent onset of azotemia.
- Most two common causes: Acute tubular Necrosis and Progressive Glomerulonephritis (RPGN).
- Can Result of Toxins Like Some Antibiotic and Immunotherapy (Aminoglycosides) OR Myoglobinuria

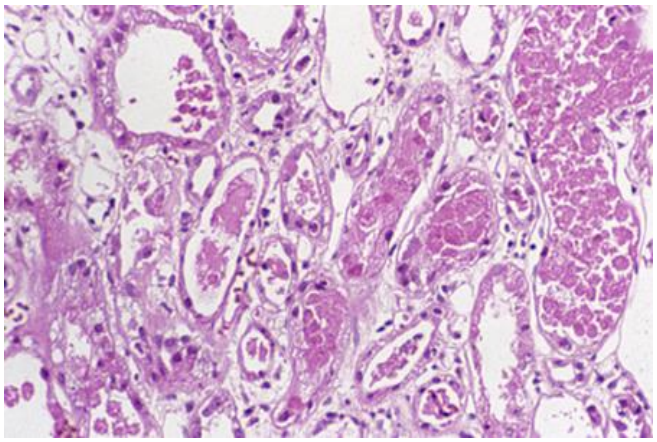
Pre-renal (Decrease effective blood flow to the kidney)	Renal	Post-renal (is a consequence of urinary tract obstruction)
▪ Low blood volume, low blood pressure, and heart failure. ▪ Renal artery stenosis, and renal vein thrombosis. ▪ Renal ischemia.	▪ Glomerulonephritis. ▪ Acute tubular necrosis. ▪ Acute interstitial nephritis.	▪ Benign prostatic hyperplasia. ▪ Kidney/bladder stones. ▪ Obstructed urinary catheter. ▪ Bladder, ureteral or renal malignancy.

Gross:
1- Swollen and hemorrhagic cut section of the kidney
2- Pale and dark areas

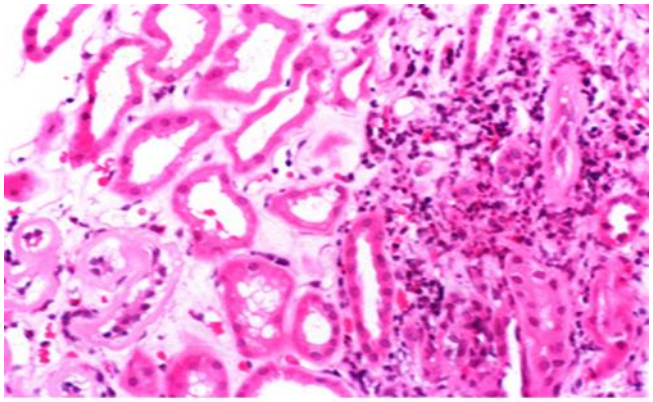


Acute interstitial nephritis / Histopathology:
1- Inflammatory cells present in the interstitium





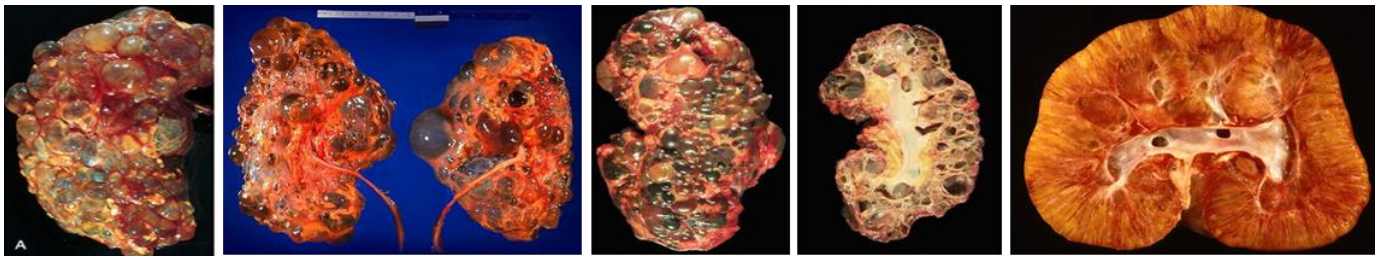
Acute tubular necrosis / Histopathology:
1- Sloughed necrotic cells in the lumen 2- Loss of the brush border 3- Flattened epithelium 4- Vacuolated cells



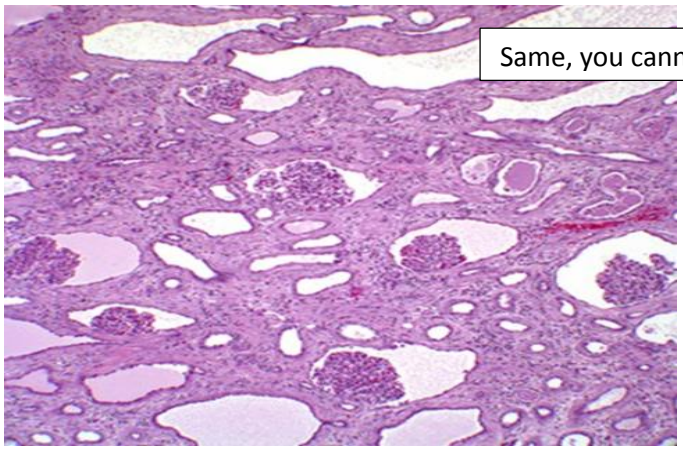
Histopathology :
1- Inflammation (in the right)
2- Edema and fibrosis (in the left)

2-POLYCYSTIC KIDNEY

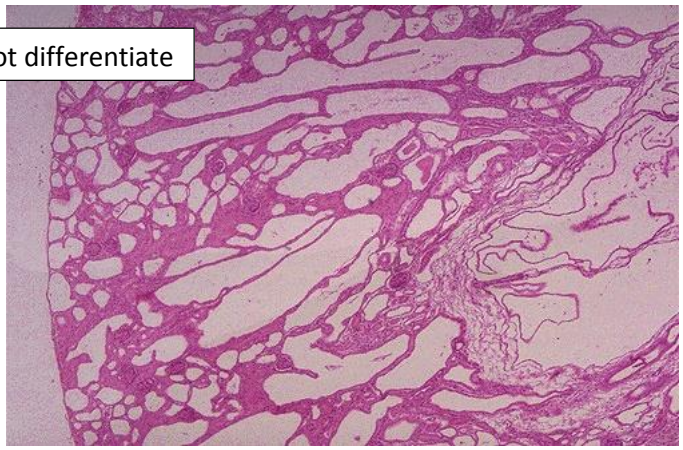
- Autosomal Dominant: Mutation in Adults
- Autosomal Recessive: Mutation in infants
- COMPLICATIONS: Hypertension, Renal failure



Gross: 1- Enlarged kidney 2- The hall kidney is replaced by numerous cysts



Same, you cannot differentiate

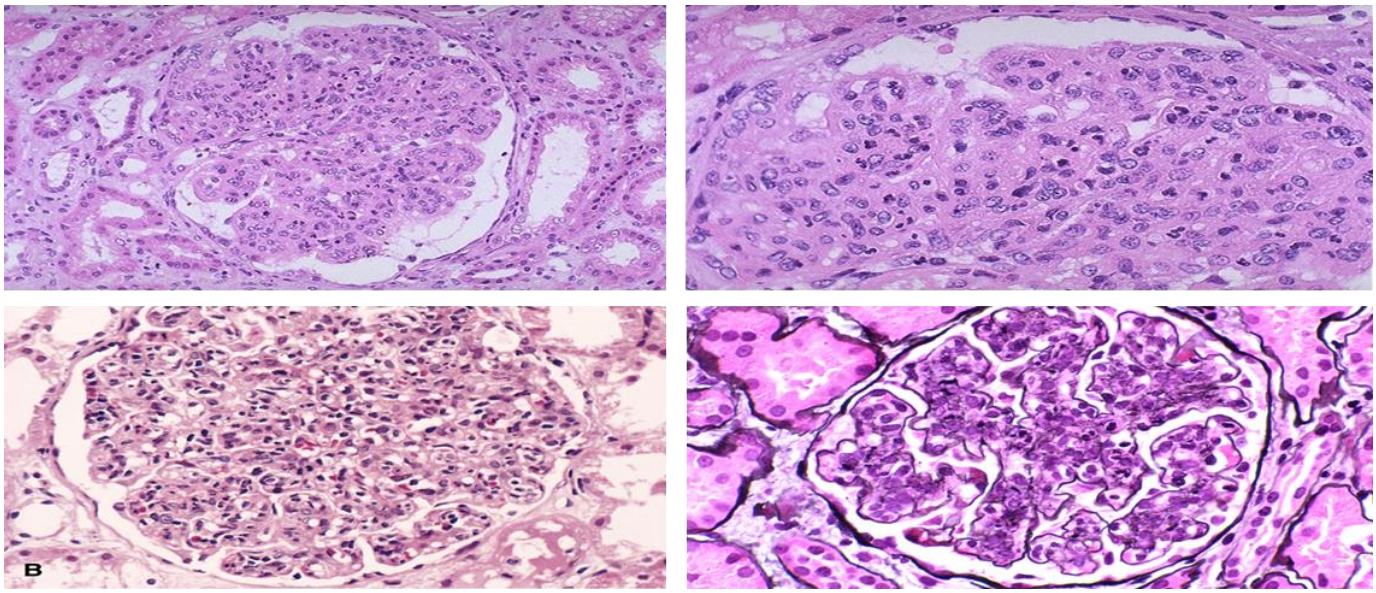


Adult type / Histopathology
1- Interstitial large cysts 2- Glomerular cyst

Infant type / Histopathology
1- Interstitial large cysts 2- Glomerular cyst

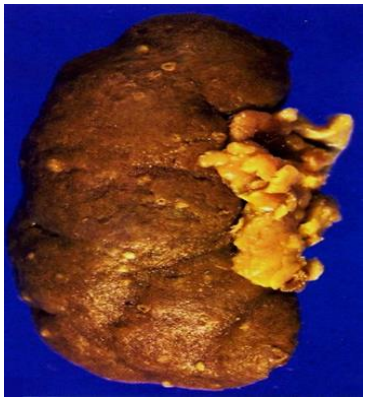
3-Acute post-streptococcal glomerulonephritis

- It is comes from 1-4 weeks after a streptococcus infection.



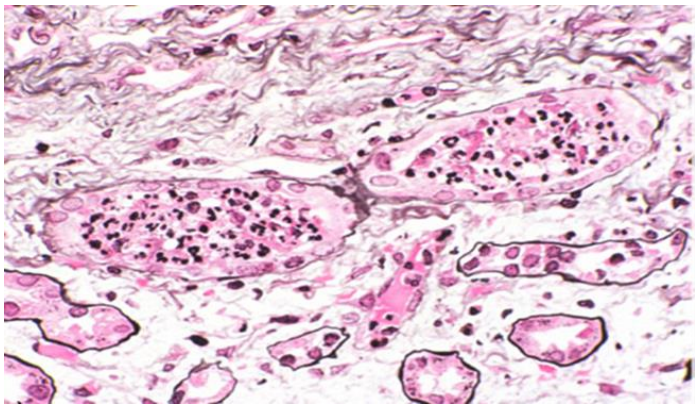
Histopathology:
1- Hypercellular glomerulus 2- Obliterated capillaries
3- Presence of endothelium, epithelium and neutrophils.

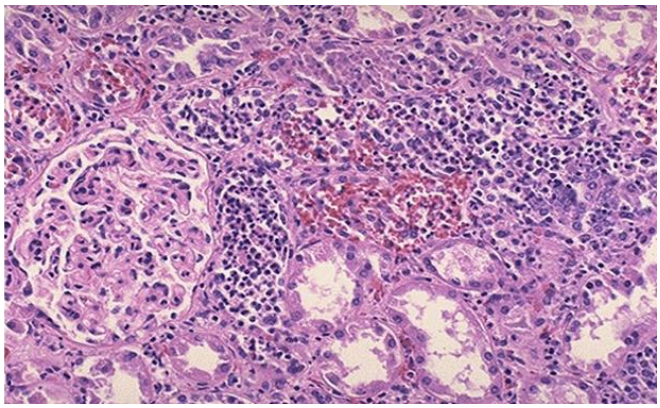
4-Acute Pyelonephritis



Gross : Small cortical abscess

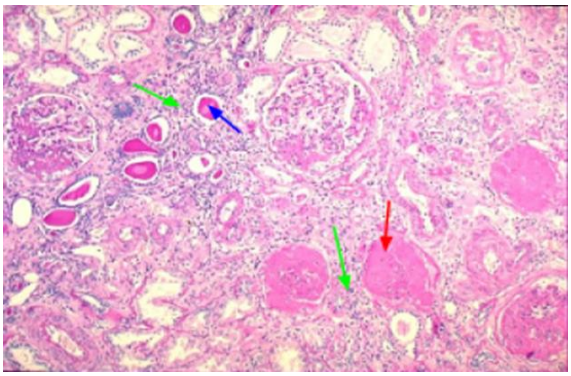
Gross : The pelvis and the calyces are filled with pus





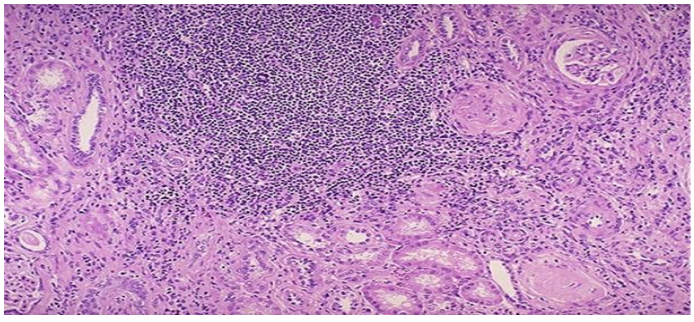
Histopathology : 1- Neutrophils present in the tubules 2- Pus in the renal parenchyma

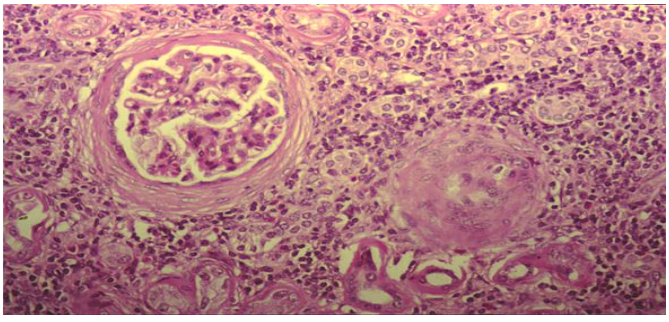
4-Chronic Pyelonephritis



Gross :
1- Atrophied kidney
2- Scarred kidney
3- Deformity of the kidney

Histopathology :
Red arrow → sclerotic glomeruli
Blue arrow → thyroidization
Green arrows → inflammatory cells

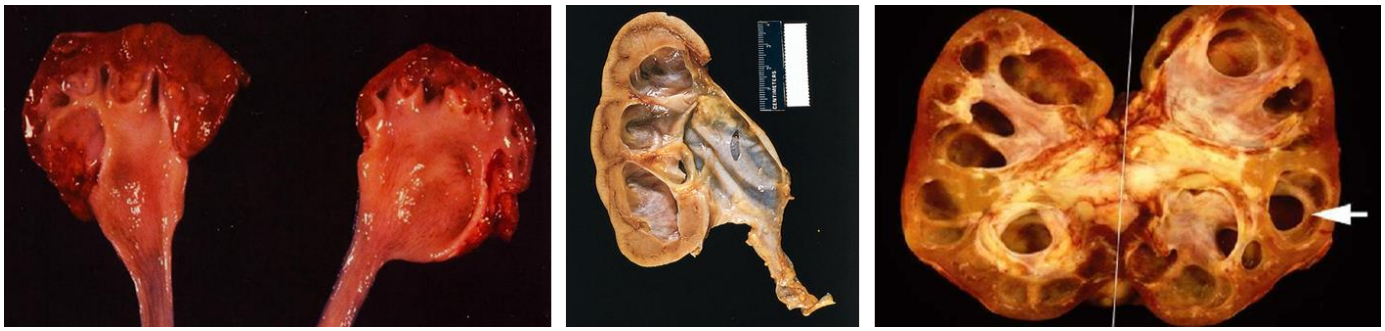




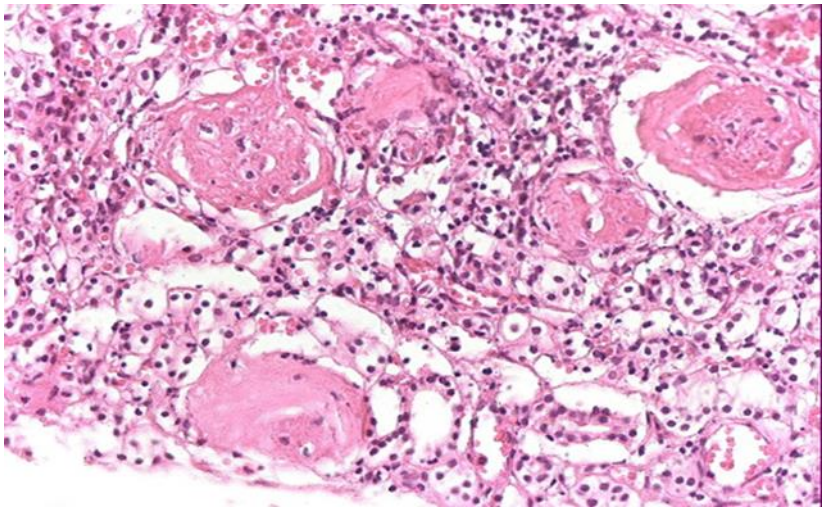
Histopathology: 1- Glomerularsclerosis 2- Interstitial inflammation (lymphocytes) 3- hyalinization

5-Hydronephrosis

- Complications: Urinary tract infection - Pyelonephritis - Renal failure.



Gross : 1- Dilated renal pelvis and calyces 2- Thinning of the cortex



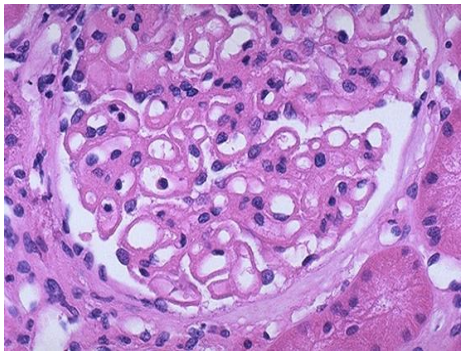
Histopathology : 1- Glomerularsclerosis 2- Interstitial inflammation.

The most common causes are:

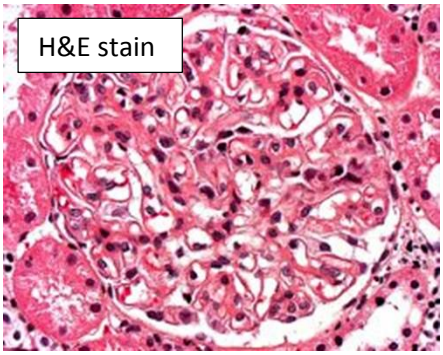
- Foreign bodies like calculi with obstruction.
- Atresia of the urethra.
- Benign prostatic hyperplasia.
- Neoplasia of the prostate and bladder.
- Spinal cord damage with paralysis of the bladder.

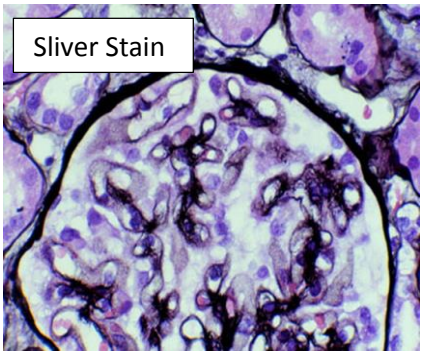
6-Membranous glmoerlonephritis "Nephritic Syndrome"

- Membranous glomerulonephritis (The common cause of Nephrotic syndrome in adults).
- Proteinuria (loss > 3.5 g/day) + Edema + Hypoalbuminemia + Hyperlipidemia + Lipiduria.
- Membranous Nephropathy can lead to Chronic Renal Failure.



Histopathology :
Capillary loops are thickened

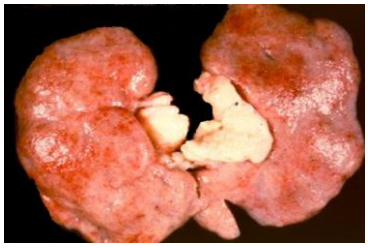




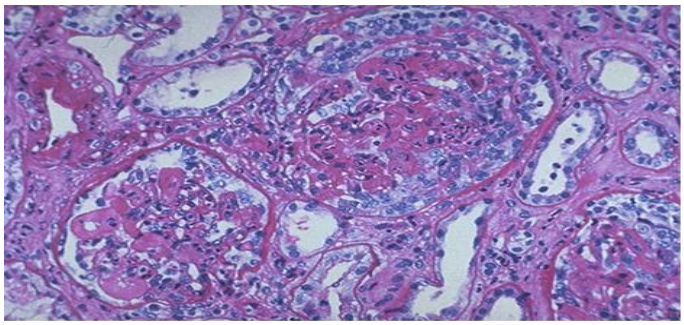
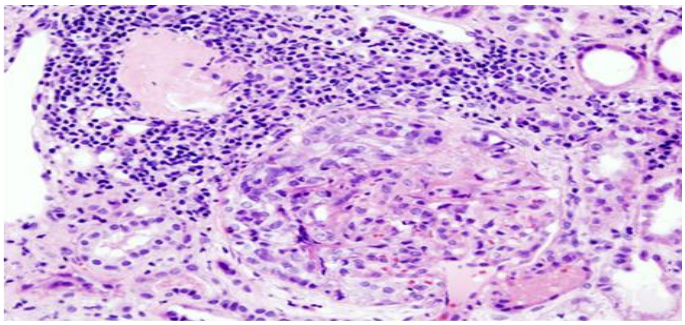
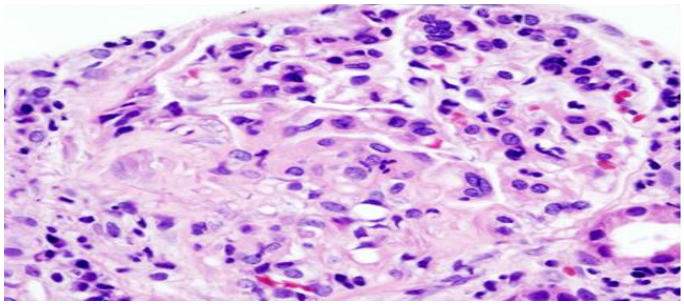
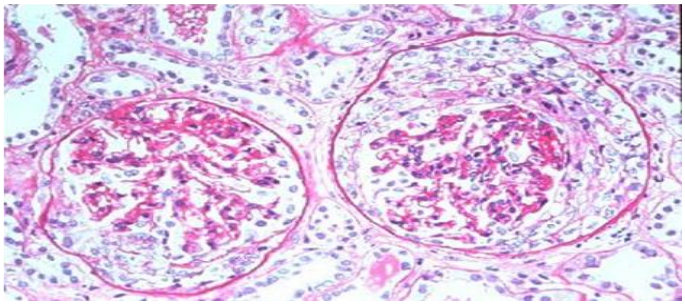
Histopathology :
1- Capillary loops are thickened
2- Duplication of the GBM
3- Spike-Dome pattern

7-Rapidly progressive glomerulonephritis "Nephritic Syndrome"

- All types of RPGN are characterize by glomerular injury and formation of crescents with monocytes and macrophages proliferation compressing the glomerulus.



Gross :
flea beaten appearance

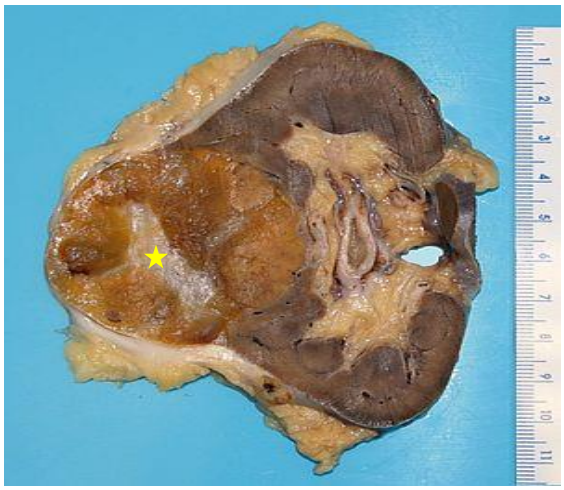
Histopathology : Crescent formation composed of epithelial cells and macrophages

RENAL TUMORS

- Signs & Symptoms of Tumors: Fever, Malaise, Rapid loss of weight & appetite.
- Specific Symptoms of UT Tumors: Hematuria, Flank pain (kidney), abdominal mass.
- Common histological findings in neoplasms: Polymorphism, Mitosis, Necrosis, Hyperchromatism

BENIGN RENAL TUMORS

8-Oncocytoma → Excellent prognosis "can be treated"

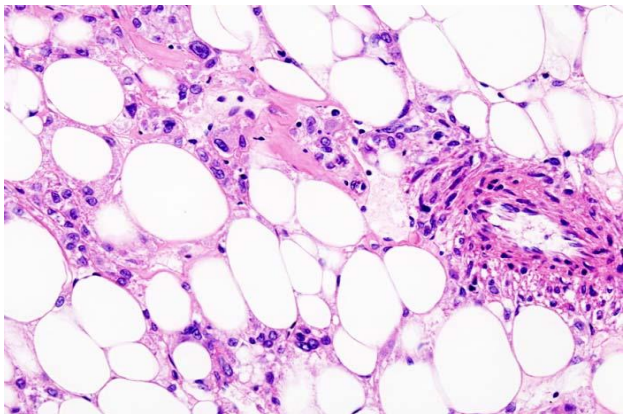


Gross :
1- Well circumscribed renal parenchymal mass
2- Yellowish cut surface
3- central scar "Yellow star"

Histopathology :
Sheath of tumor cells with round nuclei and prominent nucleoli and abundant eosinophilic granular cytoplasm

9-Angiomyolipoma

- Angio = vascular, myo= smooth muscle cells, lipoma = lipomatous lesion.

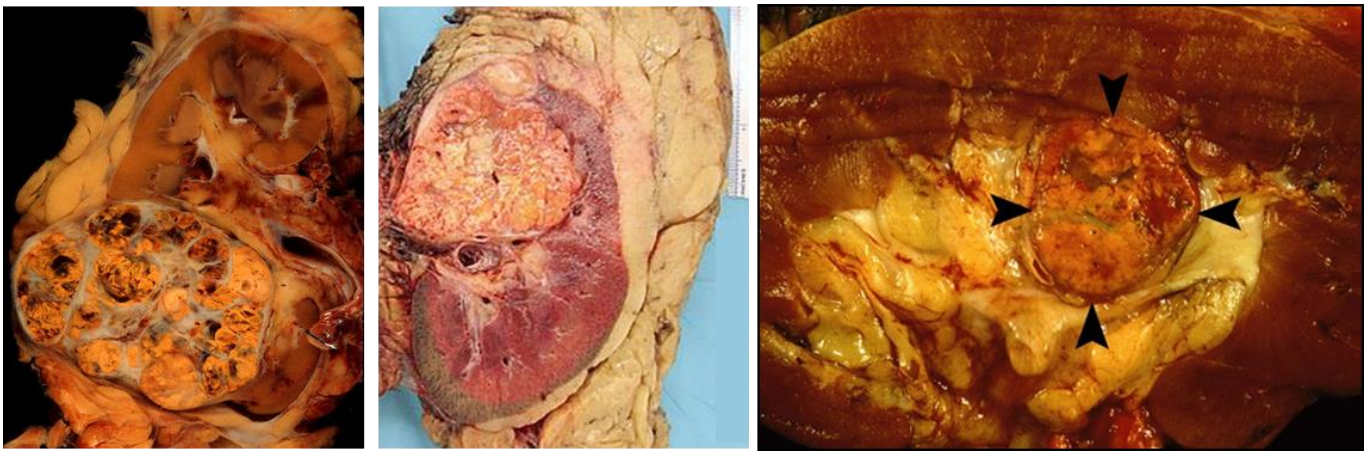


Histopathology: Composed of three things : a- Vessels b- Smooth muscles c- Fat cells

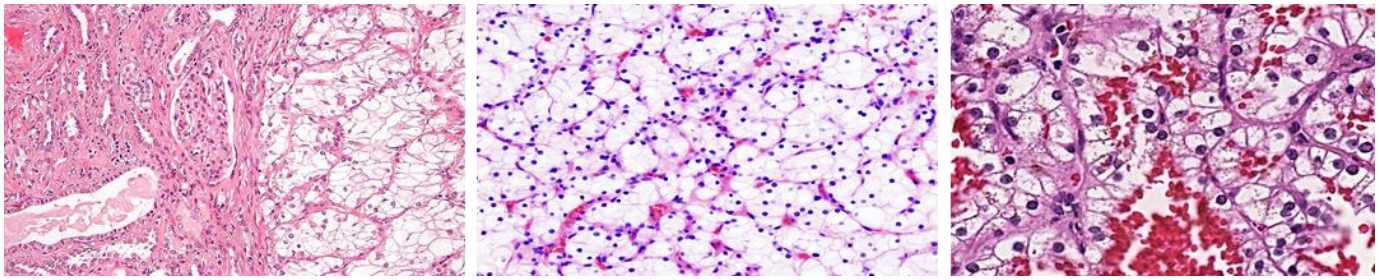
MALIGNANT RENAL TUMORS

10-Renal Cell Carcinoma

- Also called Adenocarcinoma , Hypernephroma): Large tumor + Common in male especially old male.
- The most common type of renal cell carcinoma. Associated with Von Hippel-Lindau (VHL).
- Cells are arranged as alveolar groups or tubules with papillary formations separated by thin fibrovascular septae.



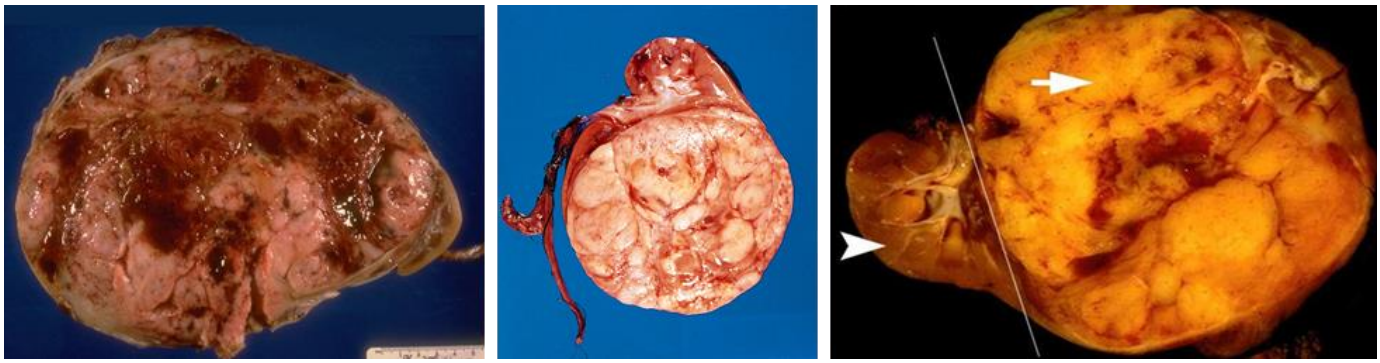
Gross : 1- Well circumscribed tumor 2- Necrosis with hemorrhagic kidney 3-well demarcated



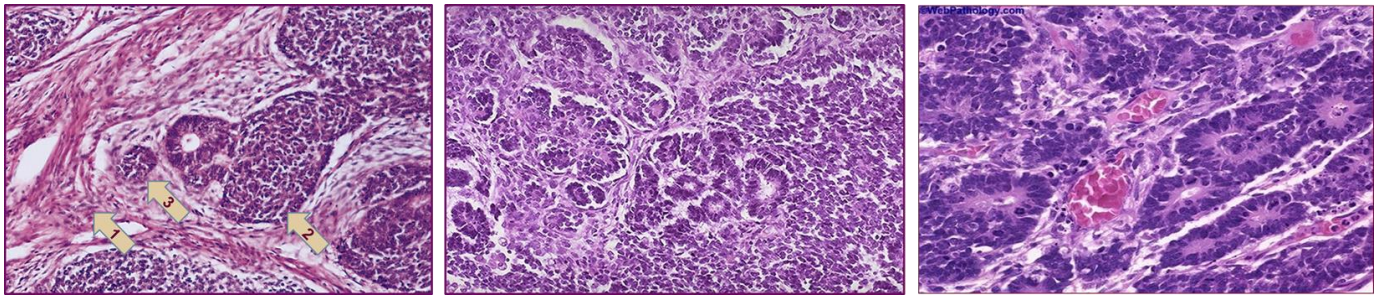
Histopathology: 1-Large cells polygonal with clear cytoplasm 2-Pleomorphism & Mitosis 3-Hemorrhage

11-Wilm's Tumor

- Most common primary tumor of the kidney in children between 2 and 5 in age
- Usually child comes with renal failure in one kidney, Mutation in WT1 Gene.
- 3 Elements: Blastema + Stroma + Epithelia Elements



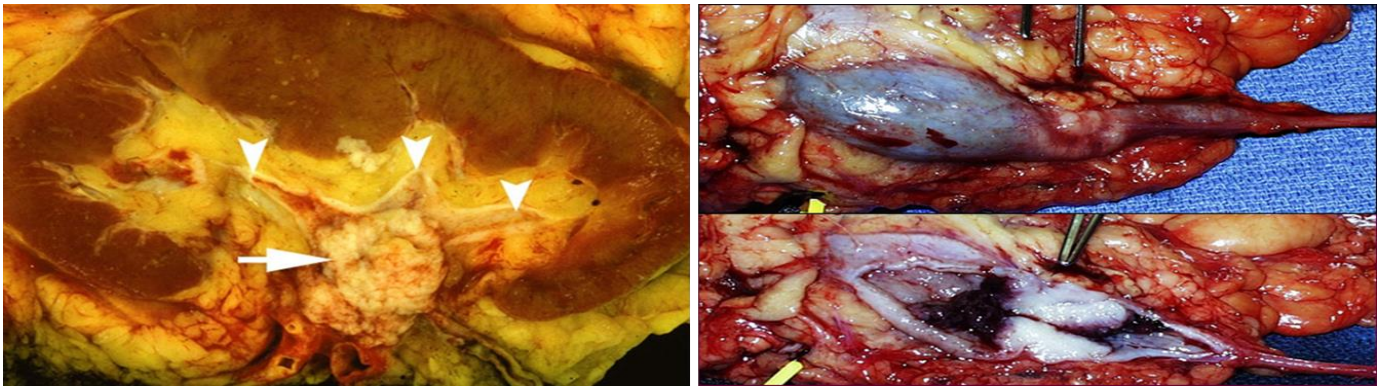
Gross: Solid hemorrhagic and necrotic large mass



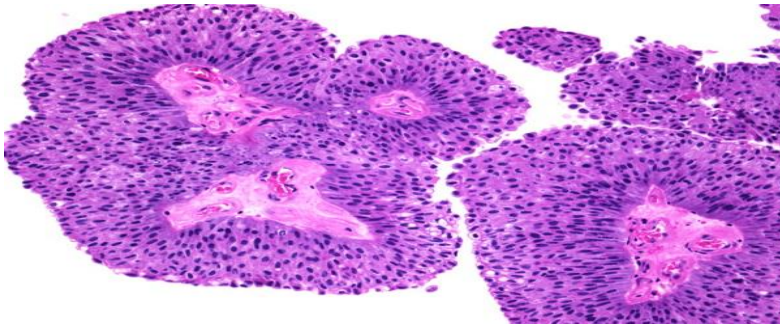
Histopathology : 1-Spindle cell stroma. 2-Blastema. 3-Abortive glomeruli.

12-Carcinoma of renal pelvis (urothelial)

- Central Small tumor - Multifocal - Painless hematuria - Abdominal pain due to hydronephrosis
- Risk factors: Smoking, occupational factors (aniline dyes).
- Prognosis is more worse than Transitional Cell Carcinoma of the Bladder .



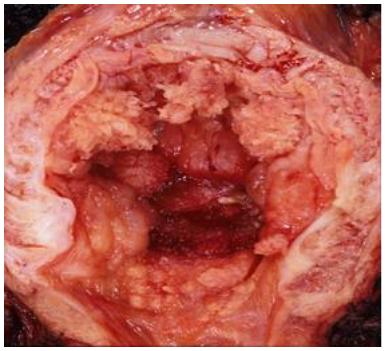
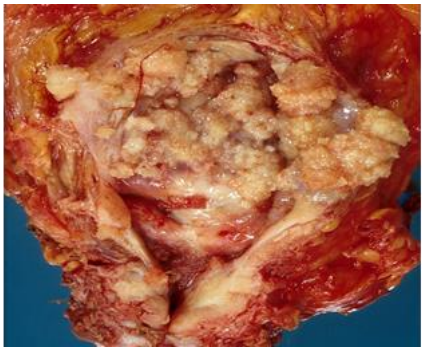
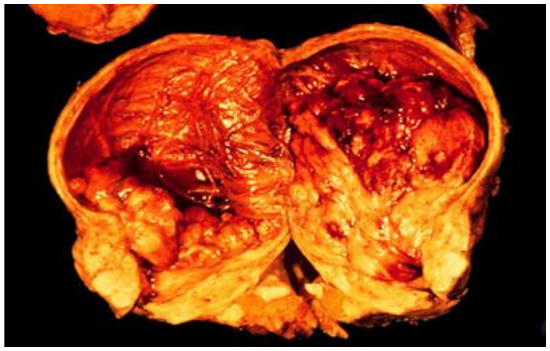
Gross: infiltrative tumor in the renal pelvis



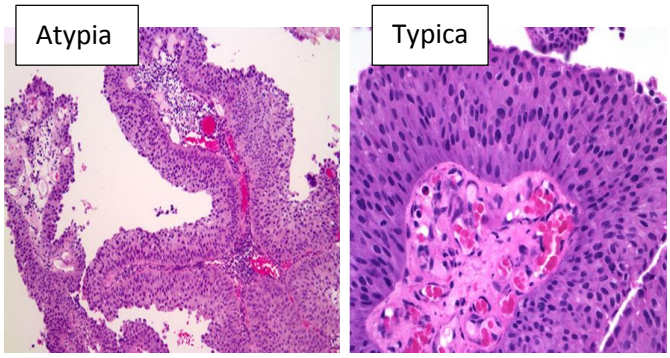
Histopathology:
1- non-invasive
2- cytological atypia

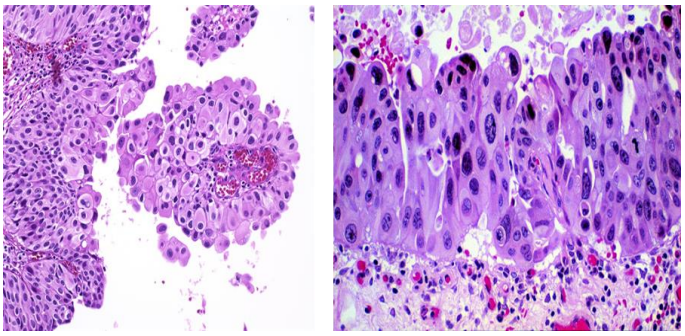
13-Carcinoma of urinary bladder

- 90% of bladder cancers are transitional cell carcinoma , Originates from transitionalepithelium .
- The other 10%: squamous cell carcinoma (caused by Schistosomiasis infection) , adenocarcinoma, sarcoma, small cell carcinoma, secondary metastases
- Clinical Features: All bladder tumors present with gross painless hematuria.
- Risk Factors: Smoking, Various occupational carcinogens.

Gross: 1- The wall of the bladder is infiltrated by tumor 2- Fingers like structure



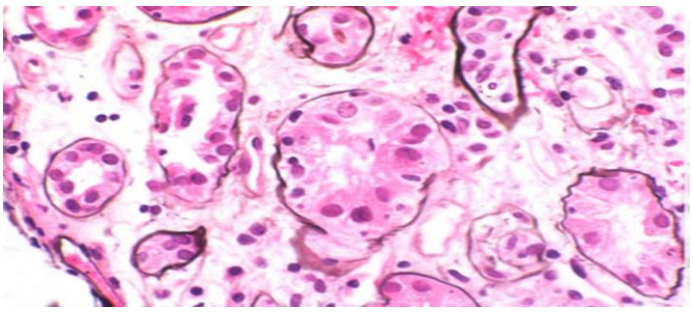


Histopathology:
Papillary structure with cytological ↑ low grade

Histopathology:
Papillary structure with cytological atypia high grade

14-Allograft

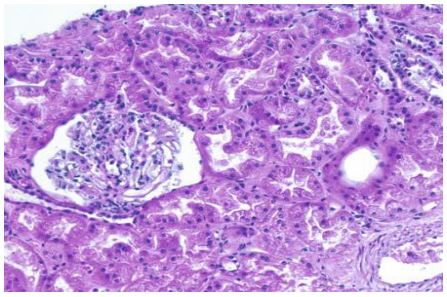
Acute cellular rejection

Gross: Hemorrhagic swollen kidney

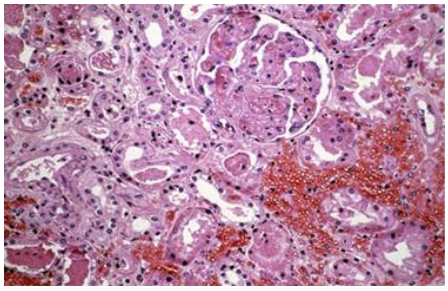
Histopathology : Lymphocytes within the tubules

Acute humoral rejection



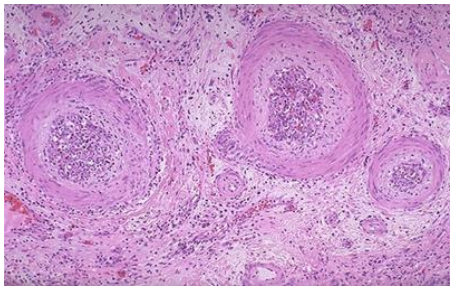
Histopathology:
1- Glomerular or tubular injury
2- Necrosis of the artery

Hyperacute rejection



Histopathology:
1- Thrombi
2- Hemorrhage
3- Neutrophilis

Chronic rejection



Histopathology:
1- intimal fibrosis
2- intimal thickening
3- intimal inflammation

Pathology OSPE 434

Pathology OSPE Revision - Male + OSPE Pathology – Team

Thanks

Good Luck