

MALIGNANT TUMOR OF THE KIDNEY:

most common malignant tumor - Renal cell carcinoma
And nephroblastoma.

RENAL CELL CARCINOMA (hypernephroma)

↓
Variegated
Appearance

- grey yellow color due to

microscopic Resemblance of the tumor cells to clear cells
of the Adrenal cortex

Risk of factors for Renal cell carcinoma:

Tobacco, Obesity, Hypertension, Tubular sclerosis,
cadmium, estrogen therapy

PATHOGENESIS:

CLEAR CELL CARCINOMA

clear cell RCC is a heterogeneous group of
malignant neoplasm, composed of cell with clear or
eosinophilic granular cytoplasm

PATHOGENESIS:

Most cases are sporadic
can be familial or occur in Association with

Von-Hippel-Lindau

VHL

(VHL disease)

VHL gene - Autosomal dominant disease

- It is tumor suppressor gene

⇒ VHL gene encodes a protein called VHL protein

which form a part of ubiquitin ligase complex
involved in degradation of other proteins.

It also helps in transcription of factor HIF-1 α

⇒ When VHL is inactive, HIF-1 α cannot be degraded
And it accumulates

High level of HIF-1 α cause expression of HIF target gene

Promote Angiogenesis

Stimulation of cell growth.

⇒ The molecular hallmark of clear cell carcinoma is the loss or
inactivation of both copies of the VHL gene

(loss of the short arm of chromosome 3 with
normal karyotype but presence of the VHL gene)

PAPILLARY RENAL CELL CARCINOMA

2nd most common type

Pathogenesis

It arises, darker pigmented, triple, bilateral, renal
x-ray shows masses, hydronephrosis

cell of origin $\rightarrow$ DC and epithelial cell

Gain of chromosome 7, 17

Loss of Y (male patients)

Mutation, Activate MET

$\uparrow$ MET signaling

Abnormal cell growth $\rightarrow$ papillary growth pattern.

CHROMOPHOBIC RENAL CELL $\rightarrow$ least common

cell of origin $\rightarrow$ intercalated cell of CD

Pathogenesis $\rightarrow$ loss of chromosome 1, 2, 6, 10, 13, 17, 7, 21 & Y

MORPHOLOGY:

CLEAR CELL

GROSS: Occurs in Any part but mainly affect upper pole

outer surface: bosselated

solitary And unilobular lesions.

Cut surface: large circumscribed, spherical masses with well demarcated margins.

Tumor is solid, bright yellow gray white, area of hemorrhage, necrosis, cystic change

Yellow colour is due to prominent lipid

Venous Drainage

One of the characteristics of RCC

→ tendency of invade the Renal vein.

IVC → RA.

MICROSCOPY

Growth pattern: solid to tubular (cord-like) nests or tubular.

Tumour cell: composed of cell with clear or granular nucleus - has Rain Appearance cytoplasm.

cell shape: Round or polygonal

cytoplasm: Abundant clear or granular

clear cell cytoplasm is due to glycogen & lipid

↓
which is removed by water &

solvents (xylene)

— Special stain: Glycogen maybe demonstrated with PAS
And fat by oil Red O stain.

→ nucleus - centrally located and small.

NOTE: Canon ball pulmonary metastases: feature of

→ RCC

→ Testicular carcinoma

Chromophobe Renal cell carcinoma

cut surface: tan brown without hemorrhage or necrosis

Microrhy: broad Alveolar pattern

wrinkled nuclei with perinuclear halos.

C.F → costovertebral or flank pain

(fluid)

Palpable Abdominal mass

Hematuria.

Paraneoplastic syndromes: examples:

⇒ polycythemia (due to erythropoietin)

⇒ Hypercalcemia (due to PTHrP)

⇒ Hypertension

⇒ Cushing's syndrome

⇒ Leukophilia, leukemoid Rⁿ

2nd day Angioid

SPREAD:

Local spread: perinephric fat and Renal sinus.

Lymphatic spread: hilar, Aortic, coeliac lymph nodes

Notable features of RCC:

→ Encapsulated in spite of being malignant

→ Spontaneous Regression

→ Prolonged period of stable disease

→ Refractoriness to cytotoxic agents.