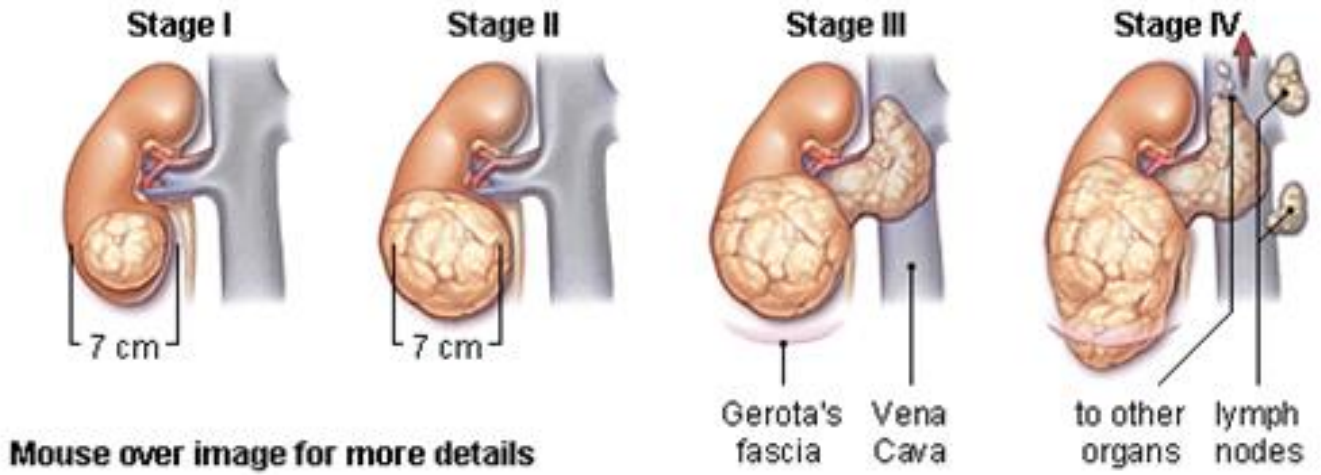
Renal Tumors



Renal Tumors

Benign tumours

1. Adenoma
2. Angioma
3. Angiomyolipoma

Malignant tumours

1. Wilms' tumour
2. Grawit'z tumour
3. Trancisional cell cancer of renal pelvis and collecting system
4. Squamous cell cancer of renal pelvis

Adenoma

- They are asymptomatic and are benign

Angioma

- Angioma may cause profuse haematuria
- Often in young adults
- The bleeding source may be difficult to diagnose without renal angiography

Angiomyolipoma

- Unusual tumour of the kidney
- Often associated with tuberous sclerosis
- High fat content has a typical appearance on CT
- Malignant elements are present in about one-quarter
- May metastasise

Renal cell carcinoma (RCC)

- Derived from renal tubular epithelial cells
- Adenocarcinoma
- Most common neoplasm of the kidney (75%)
- Among the 10 most common cancers worldwide
- Accounting for about 2% of all cancer diagnoses and deaths
- Incidence is 2–5 per 100 population
- Male:female ratio 2:1
- Occur in 5^{th} and 6^{th} decades of the life

Pathology

Macroscopic level,

- The cut surface of RCC tumours is golden-yellow in colour
- Frequent haemorrhagic, necrotic and cystic areas

Microscopically,

- Tumour cells with clear cytoplasm
- Arranged in nests or tubules surrounded by a rich vascular network

Tumour Grading

- Most widely used grading system for RCC is the **Fuhrman grading system**
- Defines 4 nuclear grades
- In order of increasing nuclear size, irregularity and nucleolar prominence

Leibovich score

- Following nephrectomy – the Leibovich prognostic score
- Runs from 0 to 11 and is based on the tumour's stage, grade, size, involvement of lymph nodes and the presence of tumour necrosis histologically

Spread

Direct

- Gerota's fascia and renal vein (10%)

Lymphatic

- Hilar lymph nodes
- Para aortic lymph nodes

Metastasis

- Lung
- Bone

Staging

Staging renal cell carcinoma is based on size, position and lymph node involvement

- **Stage I**: tumour <7 cm in the largest dimension, limited to the kidney
- **Stage II**: tumour >7 cm in the largest dimension, limited to the kidney
- **Stage III**: tumour in the major veins or adrenal gland with intact Gerota's fascia, or regional lymph nodes involved
- **Stage IV**: tumour beyond Gerota's fascia

Clinical features

- May be asymptomatic at presentation
- Classic triad

1. Haematuria
2. Loin pain
3. Loin mass

- All 3 present in 10% patients
- Varicocole – left
- Clot colic

- Atypical presentation
- Due to metastasis
- Bone pain
- Pathological fractures
- Pulsatile mass
- Persistent cough
- Haemoptysis
- Persistent pyrexia
- Anemia
- Polycythemia
- Hypercalcemia
- Nephrotic syndrome
- Chronic renal failure
- Inferior venacava obstruction

Diagnosis and investigations

- Blood tests

1. Hb and ferritin - for anaemia
2. Electrolytes and Creatinine - renal function
3. Corrected calcium and alkaline phosphatase – Raised in bony metastases

- Pre- and post-IV contrast-enhanced CT scan of abdomen and chest

Diagnostic and staging investigation of choice

Delineates size, local extent, local invasion, likely sites of possible metastases

- Isotope bone scan if there is clinical or biochemical evidence of bony metastases

Treatment

Surgery

- Recommended as the only curative treatment (Except – very elderly, extensive (inoperable) local invasion, presence of metastases)
- May be via open or laparoscopic approach
- Radical nephrectomy - for large tumours
- Partial nephrectomy - for peripheral tumours <4cm in size
- Resection of the primary cancer is occasionally appropriate with the presence of metastasis

Partial nephrectomy

- Completely remove the primary tumour while preserving the largest possible amount of healthy renal parenchyma
- Indication

1. T1 tumour and a normal contralateral kidney
2. In patients with RCC who have only one kidney (anatomically or functionally)
3. Bilateral synchronous RCC
4. Von Hippel–Lindau syndrome

Radical nephrectomy

- Removal of the kidney, perirenal fat, adrenal gland and regional lymph nodes
- Patients with a tumour <5 cm in size, located at the inferior pole - the adrenal gland can be spared
- Laparoscopic procedure
- Open procedure
- Cytoreductive nephrectomy in those with metastatic disease

Medical therapy

- Used for metastatic disease
- Biological therapy - immune modulators such as interferons and interleukins

Partial response rates of 15–20%

Carries significant morbidity

Reserved for patients with a good performance status

- Chemotherapy - Tumours are not chemosensitive
- Hormonal therapy (androgens and tamoxifen)
- Radiotherapy - To palliate painful bony metastases

Prognosis

- Outcome following nephrectomy is unpredictable
- Tumour confined to the kidney – good prognosis
- Cure is likely if the tumour is <4cm in diameter and if there are no adverse pathological features
- Adverse risk factors

I. extracapsular spread

II. Invasion of the renal vein

III. lymph node involvement

Wilms' tumour (nephroblastoma)

- Mixed tumour (blastemal, stromal, epithelial elements)
- Contains elements from embryonic nephrogenic tissue
- During the first five years of life
- Usually in one pole of one kidney
- Rapidly growing tumour
- Friable in consistency
- 10% of childhood tumour
- Male to female ratio 1:1

Clinical features

- An abdominal tumour grows rapidly
- Mass may be very large
- Some patients are hypertensive
- Haematuria - unfavourable symptom denoting extension of the tumour into the renal pelvis
- Abdominal pain
- Fever

- Metastasis to the lungs occurs early
- Liver, bone and brain metastases are rare
- Lymphatic spread is uncommon

Treatment

- Best treated in specialist paediatric oncology units
- Most unilateral tumours are treated by chemotherapy followed by nephrectomy
- Partial nephrectomy may be possible in patients with bilateral disease

Investigations

- X-ray abdomen – egg shell peripharal calcification
- Ultrsound scan
- CT scan
- MRI

Prognosis

- 80% survive long term with modern chemotherapy and surgery

- The prognosis is worse with

1. metastases
2. older children

5y survival:

- Early stage, 90%
- Disseminated disease, 30%