## Differential diagnosis of renal mass

### Congenital
- 1. Polycystic kidney
- 2. Pelviureteric junction obstruction
- 3. Multicystic dysplastic kidney
- 4. PUV causing hydronephrosis

### Traumatic
- 1. Perirenal urinoma
- 2. Perirenal hematoma

### Inflammatory
- 1. Perinephric abscess
- 2. Intrarenal abscess
- 3. TB pyelonephritis

#### Benign
- Pyelonephritis → Parenchyma
- Pyonephrosis → Pus in collecting system
- Abscess → Pus pocket in parenchyma

#### Malignant
- 1. Renal cyst
- 2. Oncocytoma → Benign, but indistinguishable from RCC on imaging

### Neoplastic
- 1. Renal cell carcinoma
- 2. Sarcoma
- 3. Lymphoma

#### Others
- Hydronephrosis → ureretic obstruction
- Wall → stricture, PUJO
- Lumen → stone, tumors
- Outside lumen → enlarged LN, tumors

### Clue to reach the diagnosis

#### History
- **Age**
  - Newborn → PUJO, Multi Cystic Dysplastic kidney K, AR – PCKD, Tumors (Mesoblastic nephroma)
  - Children → Congenital causes, tumor (Wilms), Hydronephrosis,
  - Adults → Hydronephrosis due to stones.
  - Old age → Tumors
- **Sex**
  - Renal tumors and stones are more common in male
  - Angiomyolipoma more in female

#### Associated symptoms
- Fever in perinephric abscess
- Hematuria in renal tumors and trauma
- Renal colic in hydronephrosis and stones

### General examination
- Fever : eg. inflammatory cases
- Pallor : eg. Trauma and tumors

#### Local examination
- **Inspection**
  - Echymosis and abrasions → in cases of trauma
  - Redness and pointing → in abscess
  - Diffuse bulge → in hydronephrosis and polycystic kidney.
  - Localized bulge → in renal tumor
- **Palpation**
  - By bimanual palpation
    - Site → in the renal angle
    - Size : variable
    - Shape : variable
    - Surface → regular in hydronephrosis and tumor, irregular in polycystic kidneys
    - Consistency → solid in tumors, cystic in hydronephrosis and polycystic kidneys
    - Tenderness → in perinephric abscess

### Investigations
- **Urine analysis**
  - Hematuria in tumors
  - Pus cells in abscess
  - Crystals in stones
- **Blood picture**
  - Leucocytosis in abscess
  - Anaemia in tumors and trauma
  - Metabolic abnormalities in stones
  - Uremia if affected kidney function

### Radiological
- KUB
  - Soft tissue mass
  - Obliteration of the psoas shadow
  - Ureteric stones
  - Tumor calcification
- IVP
  - 1. Soft tissue mass
  - 2. Hydronephrosis and stones
  - 3. Polycystic kidneys
  - 4. PUV
    - Assess the kidney function
- US
  - Site
  - Size
  - Cystic or solid
  - Stones
- CT
  - The most accurate
  - All criteria of the mass
  - The possible aetiology
  - Assess the kidney function
- MRI
  - No additional advantages over CT
  - Indicated in high serum creatinine
- Isotope scan
  - OF little value
  - Assess the kidney function
Differentiating splenomegaly and an enlarged left kidney

<table>
<thead>
<tr>
<th></th>
<th>Enlarged spleen</th>
<th>Left renal mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palpation</td>
<td>Hand cannot be insinuated anteriorly</td>
<td>Hand can be insinuated anteriorly</td>
</tr>
<tr>
<td></td>
<td>A notch on the anterior border</td>
<td>The inner surface is concave the outer is convex</td>
</tr>
<tr>
<td>Direction of enlargement</td>
<td>Towards the umbilicus</td>
<td>Inferiorly and lateral to midline</td>
</tr>
<tr>
<td>Movements</td>
<td>Moves early on inspiration</td>
<td>Late</td>
</tr>
<tr>
<td>Ballottement</td>
<td>Not ballotable</td>
<td>Ballotable</td>
</tr>
<tr>
<td>Percussion</td>
<td>Dull to percuss</td>
<td>Band of resonance anteriorly due to bowel gas</td>
</tr>
</tbody>
</table>

**Bosniak renal cyst classification**

<table>
<thead>
<tr>
<th>Category</th>
<th>CT features</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Thin wall, water density &amp; does not enhanced No septa, calcification, or solid component</td>
<td>Benign</td>
</tr>
<tr>
<td>II</td>
<td>Thin septa with “perceived” enhancement Fine or slightly thick calcification High attenuation non-enhancing cyst &lt; 3 cm</td>
<td>Benign</td>
</tr>
<tr>
<td>IIIF</td>
<td>Thick regular septa with “perceived” enhancement Thick regular wall with “perceived” enhancement Thick, nodular, &amp; irregular calcification</td>
<td>Likely benign Follow-up</td>
</tr>
<tr>
<td>III</td>
<td>Thick smooth or irregular septa Thick smooth or irregular wall With measurable enhancement</td>
<td>Some benign Some malignant</td>
</tr>
<tr>
<td>IV</td>
<td>Criteria of category III Enhancing mass independent of wall or septa</td>
<td>Malignant Cystic carcinoma</td>
</tr>
</tbody>
</table>

**Bosniak classification of renal cysts**

1. 1% are malignant
2. 2% are malignant
3. 3% are malignant
4. 4% are malignant

[Diagram of renal mass classification]

Table: Bosniak renal cyst classification

- **Category I**: Thin wall, water density & does not enhanced. No septa, calcification, or solid component. Benign.
- **Category II**: Thin septa with “perceived” enhancement. Fine or slightly thick calcification. High attenuation non-enhancing cyst < 3 cm. Benign.
- **Category IIIF**: Thick regular septa with “perceived” enhancement. Thick regular wall with “perceived” enhancement. Thick, nodular, & irregular calcification. Likely benign. Follow-up.
- **Category III**: Thick smooth or irregular septa. Thick smooth or irregular wall. With measurable enhancement. Some benign. Some malignant.
- **Category IV**: Criteria of category III. Enhancing mass independent of wall or septa. Malignant. Cystic carcinoma.

Diagram showing renal mass classification with respective categories and characteristics.