Diseases of the bladder:

- Congenital anomalies
- Inflammation
- Neoplasms
Congenital anomalies

Diverticula

Exstrophy
Bladder/Vesical Diverticulum

- Pouch-like evagination of the bladder wall.
- Consists of round to ovoid, saclike pouch (1-10 cm).
- Two forms
  1. Congenital form
  2. Acquired form
**Bladder/Vesical Diverticulum**

**Congenital**

- d/t focal failure of development of the normal musculature
- d/t some urinary tract obstruction during fetal development.
Bladder/Vesical Diverticulum

Acquired

Prostatic enlargement (BPH or neoplasia)

Obstruction to urine outflow

Marked muscle thickening of the wall.

Increased intravesical pressure

Outpouching of the bladder wall

Formation of diverticula.
**Bladder/Vesical Diverticulum**

- Most are small and asymptomatic.
- May be sites of *urinary stasis*, predispose to infection and the formation of bladder calculi.
- May also predispose to vesico-ureteral reflux as a result of impingement on the ureter.
- Rarely, carcinomas may arise in bladder diverticuli.
Exstrophy of the bladder

- Developmental failure in the anterior wall of the abdomen and the bladder.
- Bladder either communicates directly through a large defect with the surface of the body or lies as an opened sac.
- The exposed bladder mucosa may acquire infections that often spread to upper levels of the urinary system.
- Increased risk of adenocarcinoma arising in the bladder remnant.
- **Treatment**: Surgical correction.
Urachal anomalies.

- Normal
- Patent urachus
- Urachal cyst
- Urachal sinus
- Diverticulum
Inflammation

- **Cystitis**: important source of clinical signs and symptoms.
- More common in females of reproductive age group as a result of their shorter urethras
- **Types**: Acute/Chronic/Special forms
- **Etiology**: Bacterial infection (E.coli, proteus, Klebiella, Enterobacter)
  Maybe tubercular, candida, schistosoma
- **Symptoms**: Triad
  Frequency, Lower abdominal pain & dysuria
Interstitial Cystitis
(Chronic Pelvic Pain Syndrome)

Persistent, painful form of chronic cystitis occurring most frequently in females.

*C/f:*
- Intermittent severe suprapubic pain.
- Urinary frequency
- Urgency
- Hematuria and
- Dysuria without evidence of bacterial infection.
Interstitial Cystitis
(Chronic Pelvic Pain Syndrome)

- **Cystoscopic findings:** Fissures and punctate hemorrhages (glomerulations) in the bladder mucosa after luminal distention.

- **Chronic mucosal ulcers** *(Hunner Ulcers)*

- **Transmural fibrosis** ---- Contracted bladder.
Interstitial Cystitis
(Chronic Pelvic Pain Syndrome)
Malacoplakia.

- Peculiar pattern of vesical inflammatory reaction.
- Characterized macroscopically by soft, yellow, slightly raised mucosal plaques 3 to 4 cm in diameter.

**M/E:**
- Infiltration with large, foamy macrophages mixed with occasional multinucleated giant cells and interspersed lymphocytes.
- *Michaelis-Gutmann bodies*: Laminated mineralized concretions (resulting from deposition of calcium in enlarged lysosomes) present within the macrophages.
Soft, yellow, slightly raised mucosal plaques

Foamy macrophages & Michaelis-Gutmann bodies

Soft, yellow, slightly raised mucosal plaques
Polypoid Cystitis.

- An inflammatory lesion resulting from irritation of the bladder mucosa. Indwelling catheters are the most common cause.
- Any injurious agent may give rise to this lesion.
- The urothelium is thrown into broad bulbous polypoid projections as a result of marked submucosal edema.
Cystitis glandularis and cystitis cystica

- Common lesions of the urinary bladder
- Nests of urothelium (brunn nests) grow downward into the lamina propria.
- Epithelial cells in the center of the nest undergo metaplasia and take on a cuboidal or columnar appearance (cystitis glandularis),
- Retract to produce cystic spaces lined by flattened urothelium (cystitis cystica).
**Squamous metaplasia.**
As a response to injury, the urothelium is often replaced by nonkeratinizing squamous epithelium, which is a more durable lining..
Metaplastic Lesions of the Bladder

- **Nephrogenic adenoma.**
- An unusual lesion results from implantation of shed renal tubular cells at sites of injured urothelium.
- Overlying urothelium may be focally replaced by cuboidal epithelium, which can assume a papillary growth pattern.
- Typically less than a centimeter in size, larger lesions can produce signs and symptoms suspicion of cancer.
Metaplastic Lesions of the Bladder

Papillary growth

Tubular Proliferation
Tumors Of The Urinary Bladder

- Bladder tumor is **more frequent** cause of death than kidney tumors.
- Also known as **Urothelial / Transitional tumors**
- More common in **males, 50-80 yrs**
- **M:F =3:1**
- **Predisposing factors:**
  - Cigarette smoking (3-7 fold increase)
  - Industrial solvents (**B naphthylamine**)
  - Chronic cystitis
  - Schistosomiasis of bladder
  - Drugs (Analgesics, Cyclophosphamide)
  - Irradiation
Tumors Of The Urinary Bladder

- **Clinical Features**
  - *Painless hematuria (M/C)*
  - **Frequency**
  - **Urgency**
  - **Dysuria**
  - *Pyonephritis / Hydronephrosis*
Classification of Bladder cancer

Urothelial (transitional) tumors
- Exophytic papilloma
- Inverted papilloma
- Papillary urothelial neoplasms of low malignant potential
- Low grade and high grade papillary urothelial cancers
- Carcinoma in situ (CIS, or flat non-invasive urothelial carcinoma)

Mixed carcinoma

Adenocarcinoma

Small-cell carcinoma

Sarcomas
Grading of Urothelial tumors (WHO/ISUP)

- Papillomas
- Papillary urothelial neoplasm of low malignant potential (PUNLMP)
- Low grade- Papillary Urothelial carcinoma
- High grade- Papillary Urothelial carcinoma

Prognosis of bladder tms depend on
- Depth of invasion of lesion
- Histologic grade
- Differentiation
Morphology

- Papilloma—papillary carcinoma
- Invasive papillary carcinoma
- Flat noninvasive carcinoma (CIS)
- Flat invasive carcinoma
Morphology

- Tumors range from small, benign papillomas to large invasive cancers.
- May be papillary/nodular/flat.

**Papillomas:**
- < 1%
- Younger patient
- Usually solitary (0.5-2 cm), do not recur
- Papillary structures having delicate fibrovascular core, covered by multilayered transitional epithelium.
Papillary Urothelial Neoplasms Of Low Malignant Potential (PUNLMPs)

- Similar to papilloma except for thicker urothelium or diffuse nuclear enlargement.
- Mitoses rares
- At cystoscopy, these tumors tend to be larger than papillomas and may be indistinguishable from low- and high-grade papillary cancers
Papillary Urothelial Neoplasms Of Low Malignant Potential (PUNLMPs)
Low grade papillary urothelial carcinomas

- Orderly appearance.
- Cohesive cells maintain polarity.
- Definite evidence of nuclear atypia, consisting of scattered hyperchromatic nuclei.
- Infrequent mitotic figures towards the base.
- Recurrence can be seen.
Low grade papillary urothelial carcinomas
High grade papillary urothelial cancers

- Cells dyscohesive
- Large hyperchromatic nuclei
- Mitotic figures frequent.
- Loss of polarity.
- Higher incidence of invasion into the muscular layer.
Histology: Normal UB
Low grade

High Grade

Low grade

High Grade
### Pathological Tumor Staging (AJCC/UICC)

<table>
<thead>
<tr>
<th>Depth of Invasion</th>
<th>AJCC/UICC</th>
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<tbody>
<tr>
<td>Ta</td>
<td>Noninvasive, papillary</td>
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<tr>
<td>Tis</td>
<td>Carcinoma in situ (noninvasive, flat)</td>
</tr>
<tr>
<td>T1</td>
<td>Lamina propria invasion</td>
</tr>
<tr>
<td>T2</td>
<td>Muscularis propria invasion</td>
</tr>
<tr>
<td>T3a</td>
<td>Microscopic extra-vesicle invasion</td>
</tr>
<tr>
<td>T3b</td>
<td>Grossly apparent extra-vesicle invasion</td>
</tr>
<tr>
<td>T4</td>
<td>Invades adjacent structures</td>
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</tbody>
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Urothelial Tumors

- **Local spread:**
  - Prostate
  - Seminal vesicles
  - Ureters and
  - Retroperitoneum

- **Hematogenous spread:**
  - Liver
  - Lung and
  - Bone marrow
Urothelial Tumors

- **Treatment**

- **Transurethral resection**: Localized papillary tumors.

- **Topical BCG therapy**: Pts at risk of recurrence or progression

- **Radical cystectomy**: High grade papillary cancer, tumor invading muscularis.
Thank you