

Bladder cancer

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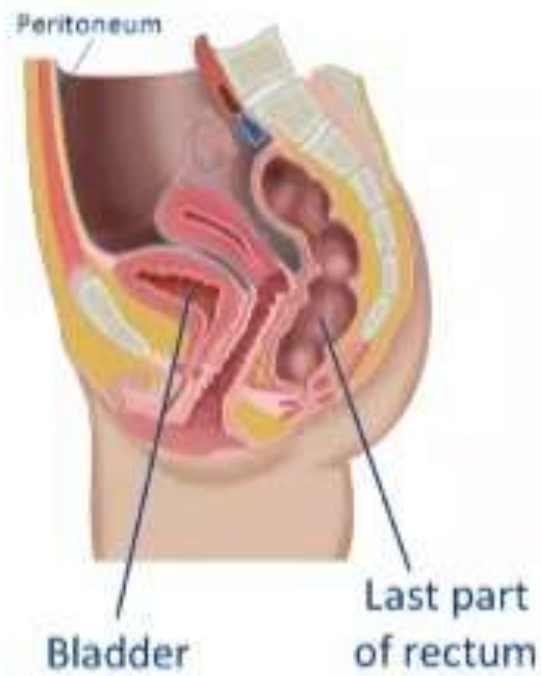
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Subperitoneal



Preperitoneal

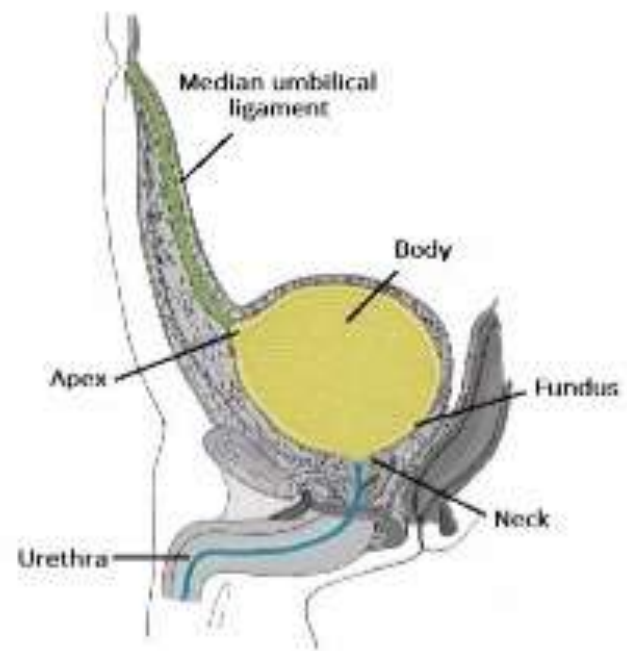


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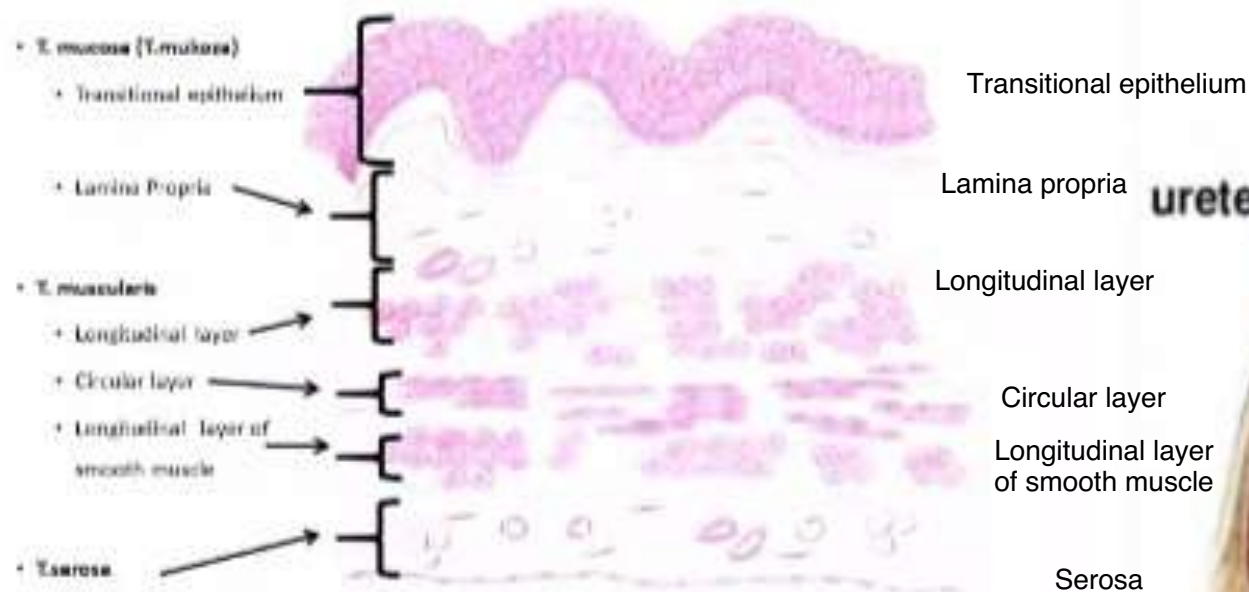
❖ *Parts of the Urinary Bladder:*

- **Apex** (attached to median umbilical ligament which connects bladder with umbilicus)
- **Body** (resevoir for urine)
- **Neck** (narrow portion leading to urethra)
- **Fundus** (located in the posterior wall of the bladder, contains the trigone)

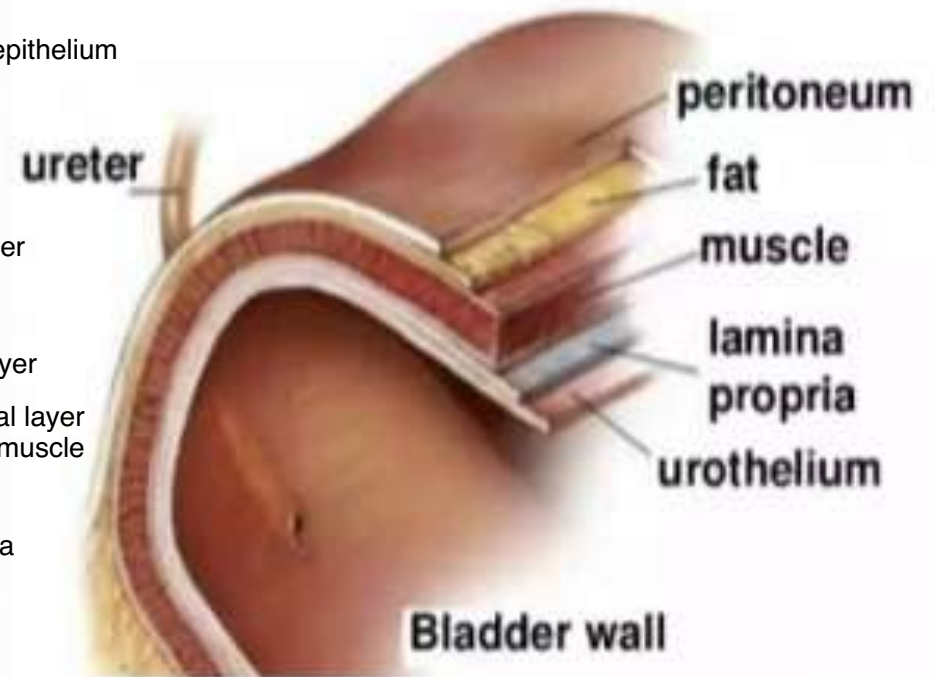


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Layers of the Bladder Wall



Epidemiology

- Male
 - * 4th most common cancer in males.
 - * 9th most common cancer in females.
- Affect men more than women 4-3:1
- Higher incidence in whites than in African Americans
- In middle-aged and older adult males, bladder cancer is the second most prevalent malignancy after prostate cancer
- Age: average age is 65

* When it invades the muscles, it is associated with high mortality.

* It is more common in men, but if it occurs in women, the mortality will be higher

- Risk Factors

- Smoking; 50% of cases: 3-fold increased risk relative to non-smokers (aromatic amines, arsenic, polyaromatic hydrocarbons (PAHs), aldehydes)

- Aromatic amines exposure: in rubber, plastic, dyes, paint, metal and leather industries

we should ask about occupation in history

❑ Almost all bladder cancers are epithelial in origin:

➤ More than 90% are transitional cell carcinomas (urothelial carcinoma).

➤ 5% of bladder cancers are squamous cell carcinomas

➤ 2% are adenocarcinomas.

➤ Non-urothelial primary bladder tumors are rare;

(SCC, carcinosarcoma, primary lymphoma, sarcoma)

Histological subtype

- **Urothelial carcinoma** *most common type

- **Squamous cell carcinoma**

Persistent inflammation due to long-term indwelling Foley's or bladder stones.

In underdeveloped countries, associated with Schistosoma haematobium (Bilharzia) bladder infection "Egypt".

Prognosis for bilharzial better than for non bilharzial.

- **Adenocarcinoma** *Rare type → associated with congenital anomalies like patent urachus, it could be a foci for adenocarcinoma

Glandular phenotype (Urachal and non-urachal adenocarcinoma)

bladder exstrophy

remnant of urachal

long history of cystitis

cystoplasty.

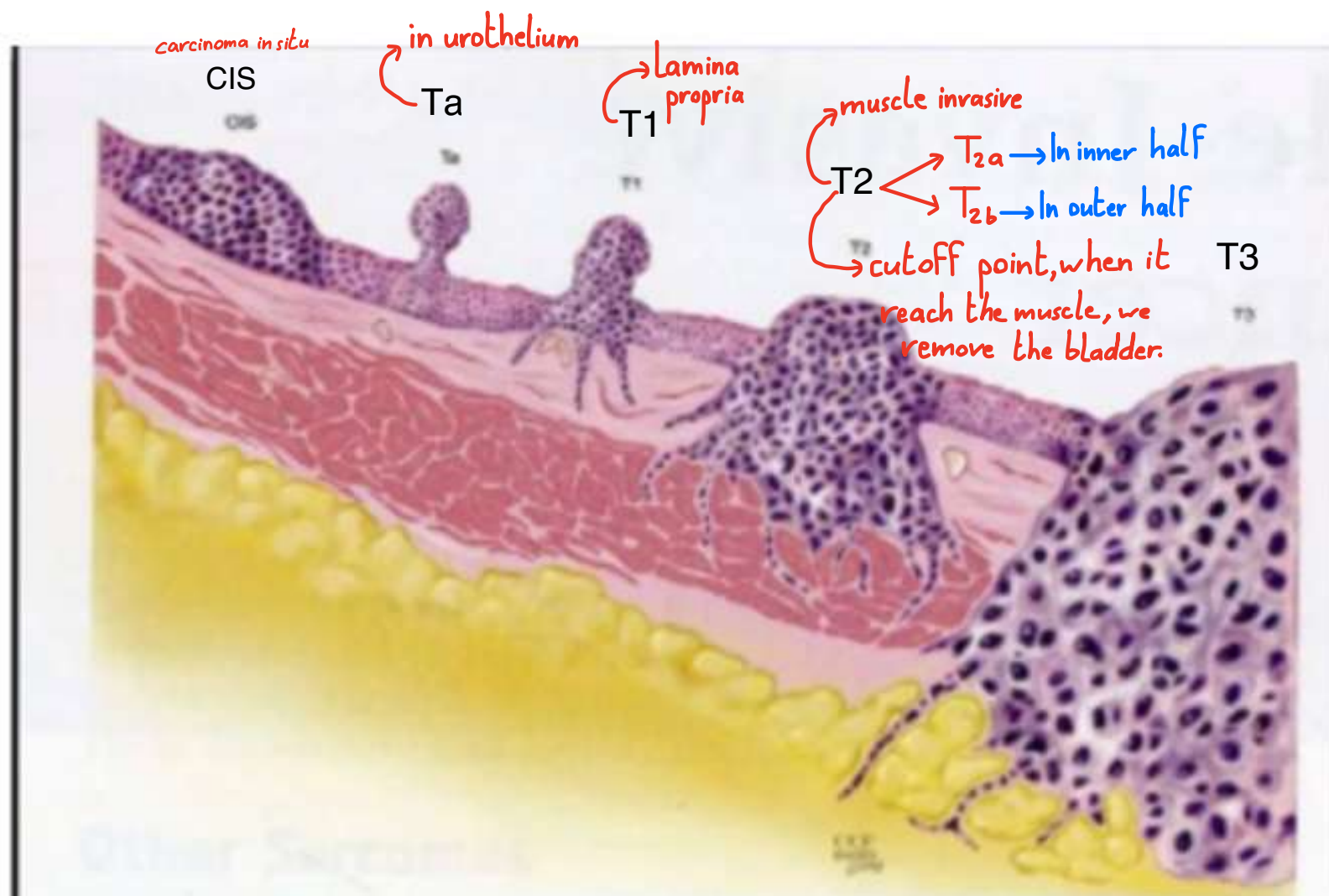


Figure 76-1. CIS is a high-grade, flat malignancy confined to the urothelium. Papillary tumors confined to the urothelium are Ta, whereas papillary tumors invading lamina propria are T1. The T1 tumor here intertwines with the wispy fibers of the muscularis propria but by definition does not invade the smooth muscle fibers of the detrusor. T2 tumors invade the detrusor muscle, and T3 tumors are into extravesical fat as shown.

Presentation

* We could Find Fixed bladder or in advanced disease abdominal lymphadenopathy on P/E.

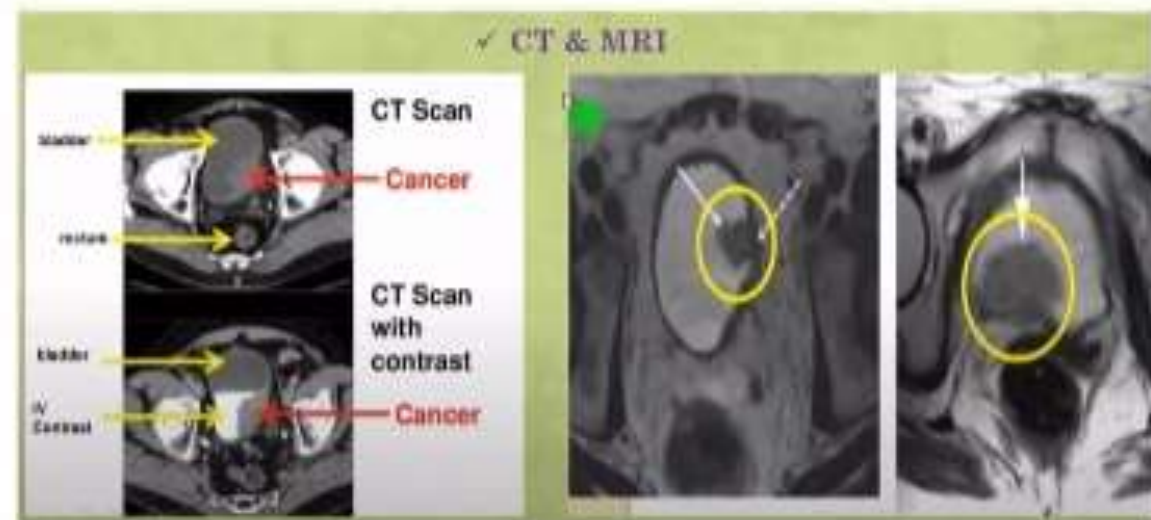
- Painless gross hematuria
- Irritative voiding symptoms
- Urine retention due to a clot
- Incidentally

Unremarkable in most patients, but may find:

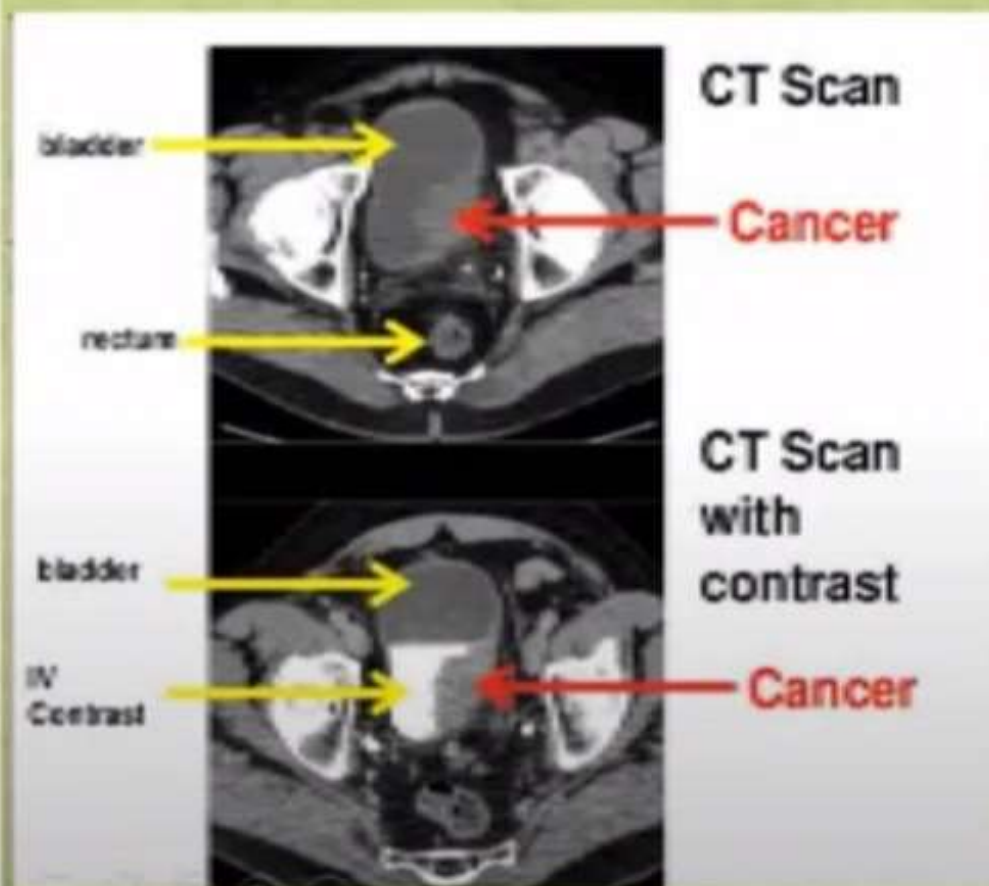
- Induration of the prostate gland can sometimes be felt on DRE (bladder neck ca invading the prostate).
- A solid pelvic mass may be felt in advanced cases.
- Nodularity in the periumbilical region can be seen in advanced lesions involving the dome of the bladder. (urachal cancers)
- Enlarged para-aortic lymph nodes or hepatic metastases

Diagnostic workup

1. Cystourethroscopy
2. Urine cytology
3. UTCT (unenhanced)
4. Urinary biomarkers



✓ CT & MRI



✓ CT & MRI

CT Scan

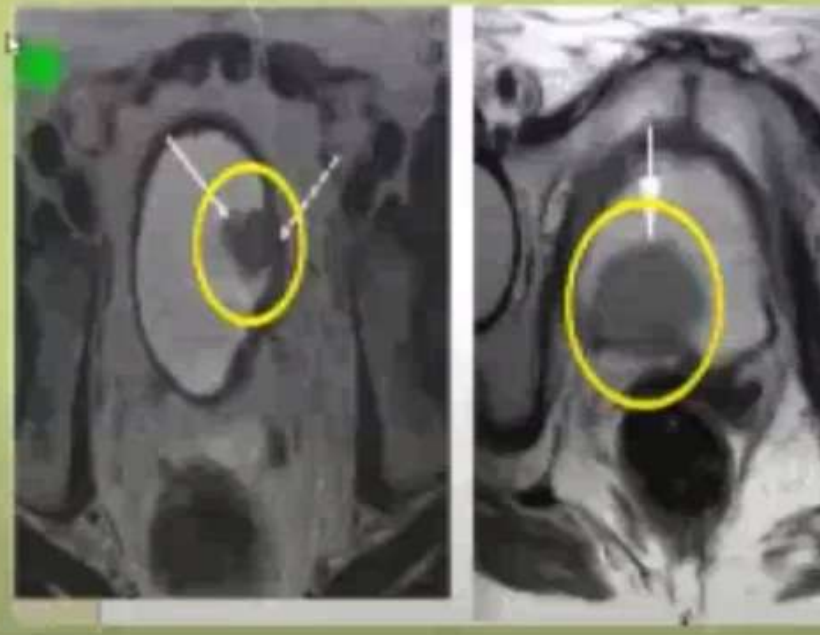
Cancer

CT Scan

with

contrast

Cancer



*We enter to the bladder and we resect the whole tumor and give it to the lab for histopathology and staging

*This procedure is called TURBT (transurethral resection of bladder tumor)

Cystourethroscopy

*We also need to know the grade of tumor (low grade vs high grade) ^{→ better prognosis}

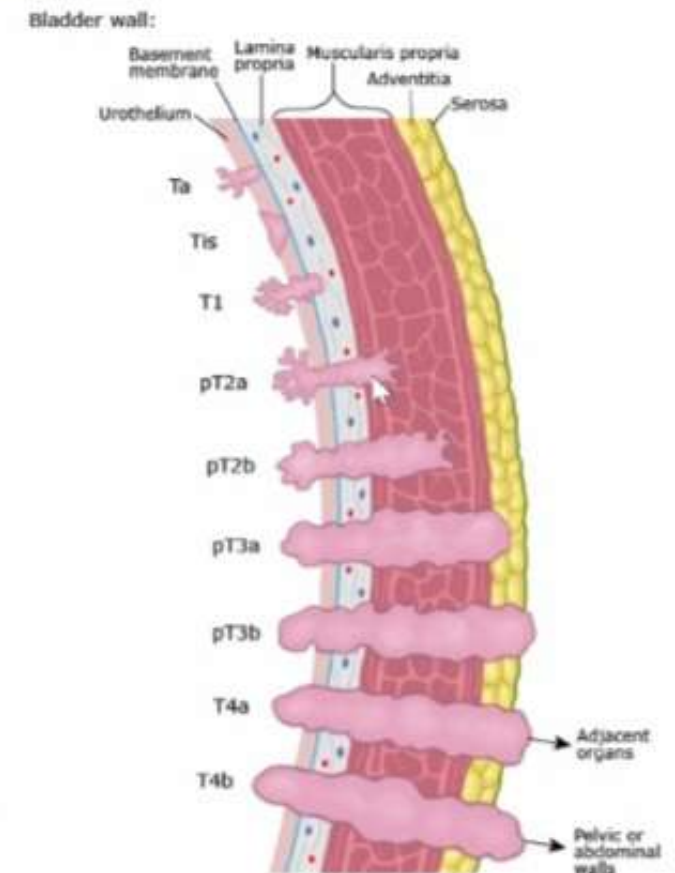
- Gold standard for
 - - initial diagnosis and staging
 - - to determine the histology and depth of invasion
- Definitive diagnosis made on biopsy taken by rigid cystoscope
- EAU recommends Fluorescent cystoscopy for CIS detection.

cauliflower like appearance



Pathological Staging (TNM classification)

- Ta: non-invasive (papillary) exophytic lesions
- Tis: carcinoma in situ
- T1: invasion of lamina propria or submucosa
- **T2: invasion into muscle**
- T3: extend beyond muscle into perivesical fat
- T4: extending into adjacent organs
 - T4a: extend into prostate, vagina, uterus, bowel
 - T4b: fixed to abdominal or pelvic walls



Management

- Treatment of urothelial tumors depends on many factors including the presence of muscle invasion, metastasis (staging) and grading, among others. *(Non-muscle-invasive vs muscle-invasive tumors)*
- Treatment modalities include:
 - Transurethral resection of bladder tumor (TURBT)
 - Intravesical chemotherapy (mitomycin or gemcitabine)
 - Intravesical BCG
 - **Bacillus Calmette Guerin** – A live attenuated mycobacterium that stimulated immune cells at site of injection. Activated immune cells can target and kill tumor cells
 - Radical cystectomy
 - Palliative systemic chemotherapy (systemic disease)
- Treatment of non-urothelial carcinomas (squamous, adenocarcinoma) is mainly surgical.

* When we resect the tumor, we give the patient a single intravesical chemotherapy (It decrease the risk of recurrence)

* Bladder cancer has a characteristics like:-

1- High risk of recurrence

2- Field change theory (multiple independent tumor)

- * Non-muscle invasive (Ta, Tis, T1) treatment: TURBT + intravesical therapy, then we do cystoscopy
 - Intravesical therapy: 1) intravesical chemotherapy (mitomycin and gemcitabine) for low or intermediate-risk tumors or 2) intravesical immunotherapy (BCG) for high-risk patients (e.g., Tis)
- IF low risk → every 3 months
IF intermediate → we give 6 doses of chemo
IF high risk → we give 6 doses of chemo, then maintenance every 3 months

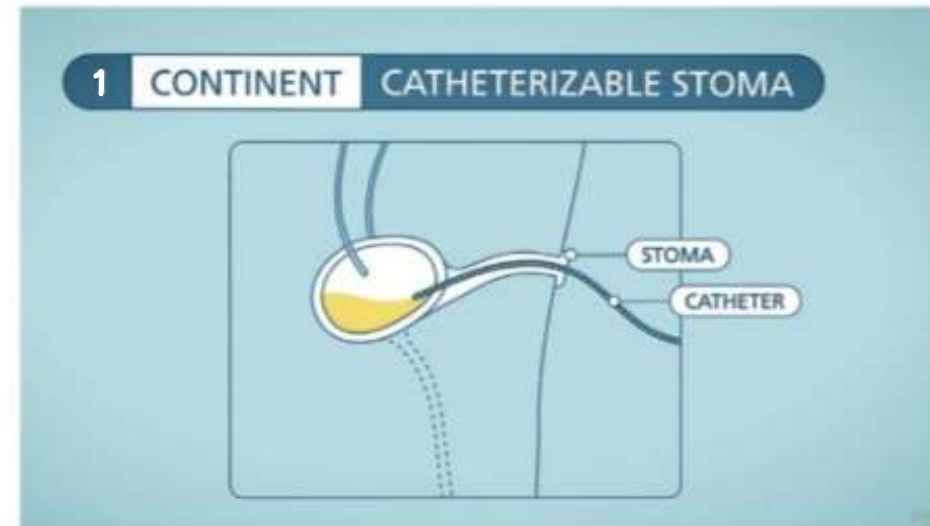
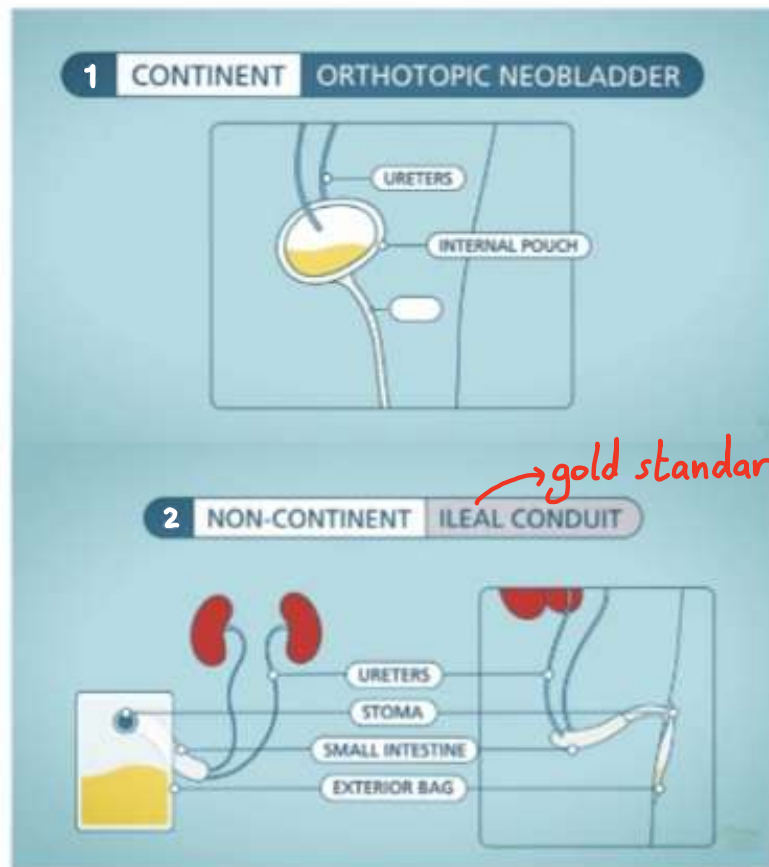
* In non-invasive bladder cancer, we fear from many complications like transformation into muscle invasive

Management: Muscle-invasive ($\geq T2$):

- Radical Cystectomy
- Males: Radical cystoprostatectomy with pelvic lymph node dissection *→ we do it in Female also*
- Females: Anterior pelvic exenteration of uterus, fallopian tubes, ovaries, bladder, urethra and segment of anterior vaginal wall.
- After radical cystectomy, urinary diversion is needed. This can be achieved via:
 - Ileal conduits
 - Cutaneous continent reservoir (e.g., Indiana pouch)
 - Orthotopic neobladder
- Neoadjuvant Chemotherapy *→ we give 6 cycle after operation* (regimens include MVAC (methotrexate, vinblastine, doxorubicin, cisplatin) or gemcitabine + cisplatin)

** IF it is a metastatic disease, we give a systemic chemotherapy*

Urinary diversion



A. Ileal conduit — incontinent diversion

This is the classic and relatively simple urinary diversion.

Construction

A short segment of ileum is isolated while maintaining its blood supply:

Kidneys → ureters → isolated ileal segment → stoma → external bag

The remaining bowel is reconnected to restore intestinal continuity.

The ureters are implanted into one end of the ileal segment, and the other end is brought through the abdominal wall to form a **stoma**. Urine continuously drains into an external appliance. Uroweb

Important point

There is **no urine storage reservoir**.

Therefore:

Ileal conduit = continuous urine drainage + external bag

B. Continent cutaneous reservoir

Here, bowel is used to create an **internal reservoir** that **stores urine**.

Basic concept

Kidneys → ureters → continent reservoir → catheterizable stoma

Unlike the ileal conduit, the reservoir has a **continence mechanism**, so urine does not continuously leak through the stoma.

The patient periodically inserts a catheter through the stoma to empty the reservoir.

Example

Indiana pouch is a classic example.

Why doesn't urine leak?

A narrow catheterizable channel is created, often using the appendix or a tapered bowel segment. Its configuration produces a **valve-like continence mechanism**.

Feature	Ileal conduit	Continent reservoir	Neobladder
Urine storage	✗	✓	✓
External bag	✓	✗	✗
Stoma	✓	✓	Usually ✗
Urethral voiding	✗	✗	✓
Catheterization	Usually ✗	✓	Sometimes
Complexity	Low	High	High
Example	Ileal conduit	Indiana pouch	Studer neobladder

C. Orthotopic neobladder

This is another **continent diversion**, but the reservoir is placed in the original bladder position and connected to the urethra.

Basic pathway

Kidneys → ureters → neobladder → urethra → outside

A segment of intestine is detubularized and reconstructed into a low-pressure reservoir. The ureters are connected to the reservoir, and the reservoir is connected to the urethra.

EAUN

The patient therefore **voids through the urethra** rather than through an abdominal stoma.

Why detubularize the bowel?

A normal bowel segment has **peristaltic contractions**.

If you simply use a tubular bowel segment, it can generate relatively high pressures.

Detubularization and reshaping creates a more **spherical, low-pressure reservoir**, which is better for urine storage.

* Upper urinary tract urothelial carcinoma

- It occurs in renal pelvis and ureters.
- 5-10% of urothelial carcinoma, the majority occurs in the bladder.
- There are a mutations that are associated with upper urinary tract urothelial carcinoma, but not bladder cancer like mismatch repair gene, microsatellite instability and could be due to some genetic syndrome like HNPCC (Lynch syndrome).
- It is more difficult to diagnose.
- In low risk, we treat it with laser, but he need follow up.
- In high risk, we do radical nephroureterectomy (we remove the kidney, ureter and the part of ureter inside the bladder).