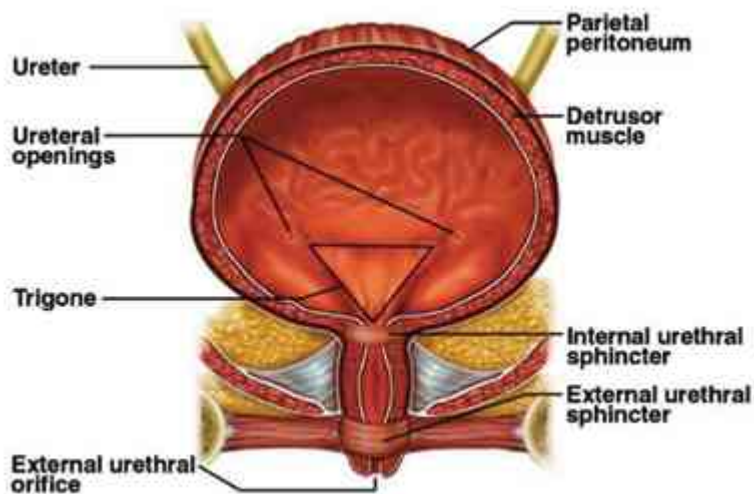


## Disorders of Urinary Bladder

د. ماجد أصغر محمد

- When empty, the adult bladder lies behind the pubic symphysis and is largely a pelvic organ.
- When it is full, it rises well above the symphysis and can readily be palpated or percussed.
- The ureters enter the bladder posteroinferiorly in an oblique manner and at these points are about 5 cm apart.
- In males, the bladder is related posteriorly to the seminal vesicles, vasa deferentia, ureters, and rectum.
- In females, the uterus and vagina are interposed between the bladder and rectum.

In both males and females, the bladder is related to the posterior surface of the pubic symphysis, and, when distended, it is in contact with the lower abdominal wall.



Histology & vascular supply

- The mucosa of the bladder is composed of transitional epithelium.
- The muscular wall is composed of bundles that decussate longitudinally and circularly.
- Blood Supply :The bladder is supplied with blood by the superior, middle, and inferior vesical arteries, which arise from the anterior trunk of the internal iliac (hypogastric) artery, and by smaller branches from the obturator and inferior gluteal arteries. In females, the uterine and vaginal arteries also send branches to the bladder.
- The venous drainage empties into the internal iliac vein.
  - The lymphatics of the bladder drain into the vesical, external iliac, internal iliac (hypogastric), and common iliac lymph nodes

### **Congenital anomalies of the bladder**

- Exstrophy ( Ectopia vesicae ):
- Exstrophy of the bladder is a complete ventral defect of the urogenital sinus and the overlying skeletal system.
- The lower central abdomen is occupied by the inner surface of the posterior wall of the bladder.
- The rami of the pubic bones are widely separated.
- Epispadias almost always accompanies it.
- Renal infection is common, and hydronephrosis caused by ureterovesical junction obstruction may be found on urography.
- Adenocarcinoma may develop in exstrophic bladders.

## Treatment

- bladder closure with sacral osteotomy in order to close the pelvic ring at the pubic symphysis.
- antiureteral reflux procedure and bladder

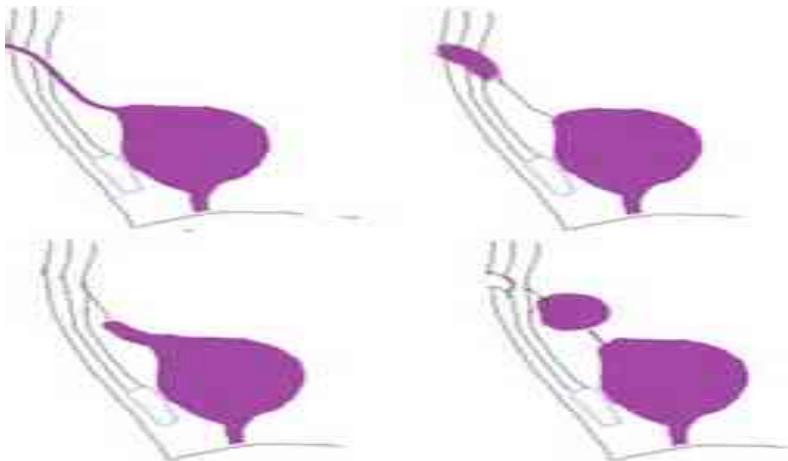
neck reconstruction.

- repair of the epispadiac penis.
- In small-capacity bladders, augmentation

cystoplasty might be needed.

## Persistent Urachus

- The urachus is a remnant of a channel allantois between the bladder and the umbilicus where urine initially drains in the fetus during the 1<sup>st</sup> trimester of pregnancy. The channel of the urachus usually seals off and obliterates around the 12<sup>th</sup> week of gestation and all that is left is a small fibrous cord between the bladder and umbilicus called the median umbilical ligament
- If incomplete at superior end , draining umbilical sinus may be noted.
- If inferior end remains opened , it communicate with the bladder.
- If the entire tract remains patent, the urine drains from the umbilicus.
- If the ends only obliterate a urachal cyst will form.



## Acquired diseases of the bladder

### ENURESIS

- Bedwetting after age 3 years.
- At age 6 years, 10% have enuresis.
- More than 50% of cases are caused by delayed maturation of the nervous system or an intrinsic myoneurogenic bladder dysfunction.
- 30% are of psychological origin.
- 20% are secondary to more obvious organic disease.
- The current thinking is that children with enuresis have high nocturnal urine production.
- Genetic factors are currently considered the primary cause of enuresis.

### Clinical Findings

- A child may wet the bed occasionally or regularly.
- The urine is of normal caliber.
- There is no burning micturition.
- General physical & urological examination are normal.

### Investigation

- Laboratory investigations are normal.
- Imaging studies like IVU & cystography are normal.
- Instrumental examination is normal.
- Cystometric studies show features of the “uninhibited” (hyperirritable) neuropathic bladder.

## Differential Diagnosis

- Lower tract obstruction (eg, posterior urethral valves, meatal stenosis).
- Chronic urinary tract infection.
- Neurogenic bladder.
- Distal urethral stenosis.

## Treatment

### General measures :

- Limitation of fluid intake after supper.
- The bladder should be completely emptied at bedtime and the child should be awakened before the usual time of bed wetting.
  - wetting alarm.

### Psychotherapy emotionally unstable parents, birth of new sibling loss of child paramount, fear , anxiety .

### Drug therapy :

- Imipramine has been reported to cure 50–70% of patients and is probably the drug of choice. The starting dose is 25 mg before dinner, which is increased as needed to 50 mg. Usually, 25 mg is sufficient, because of the unfavorable adverse effect profile and the significant risk of death with overdose, not recommended by the World Health Organization
- Parasympatholytic drugs.
- Sympathomimetic drugs.
- Desmopressin is an antidiuretic that increases renal reabsorption of water. It is given as a nasal spray by night.
-

## **DIVERTICULA**

- Most vesical diverticula are acquired and are secondary to either obstruction distal to the vesical neck or the upper motor neuron type of neurogenic bladder.
- Increased intravesical pressure causes vesical mucosa to herniate itself between hypertrophied muscle bundles, so that a mucosal extravesical sac develops.

### Complications

- The diverticula may locate just superior to the ureter & may cause vesicoureteral reflux.
- Residual urine volume may develop inside the diverticulum.
- Urinary infection may develop.
- Carcinoma may develop in the wall of the diverticulum.
- Treatment is surgical removal if symptomatic.

## **VESICAL FISTULAS**

- Vesical fistulas are common. The bladder may communicate with the skin, intestinal tract, or female reproductive organs. The primary disease is usually not urologic.

### Causes

(1) primary intestinal disease—diverticulitis,

50–60%; cancer of the colon, 20–25%; and Crohn disease, 10%.

(2) primary gynecologic disease—pressure necrosis during difficult labor; advanced cancer of the cervix.

(3) treatment for gynecologic disease following hysterectomy, low cesarean section, or radiotherapy for tumor.

(4) trauma.

## Clinical Findings

### A. Vesicointestinal fistula:

- Symptoms include vesical irritability, passage of gases & feces through the urethra.
- There may be a change in bowel habits.
- There may be signs of intestinal obstruction.
- The urine is always infected.
- Invests → barium enema, upper GIT study, sigmoidoscopy, cystogram, cystoscopy.
- Treatment is by proximal colostomy & then definitive repair.

### B. Vesicovaginal fistula

- This fistula is relatively common.
- There is continuous leakage of urine.
- Cystoscopic exam. Shows the fistula's opening.
- Vaginography often successfully shows the fistula.
- Treatment ; if large ,by surgical repair.

## Acute Cystitis

- Acute cystitis more commonly affects women than men.
- It is not due to anatomical or functional abnormality of the urinary tract.
- Fecal- perineal –urethral route is the primary mode of infection.
- 80 % of infections are caused by *E.coli*.

## Clinical features

- Frequency, dysuria, urgency.
- Lower backache & suprapubic pain.
- No systemic manifestations.
- Diagnosis is by urinalysis, urinary dipstick, urine culture & sensitivity.
- TMP-SMX, NITROFURANTOIN AND FLOUROQUINOLONE have excellent result, 3-5 day treatment course is optimal.

## Recurrent cystitis

Is caused by either bacterial persistence or reinfection with another organism, identification of the cause is important because the management of bacterial persistence and reinfection.

Urine culture and radiological imaging includes ultrasonography, IVP, CT and cystoscopy may be necessary.

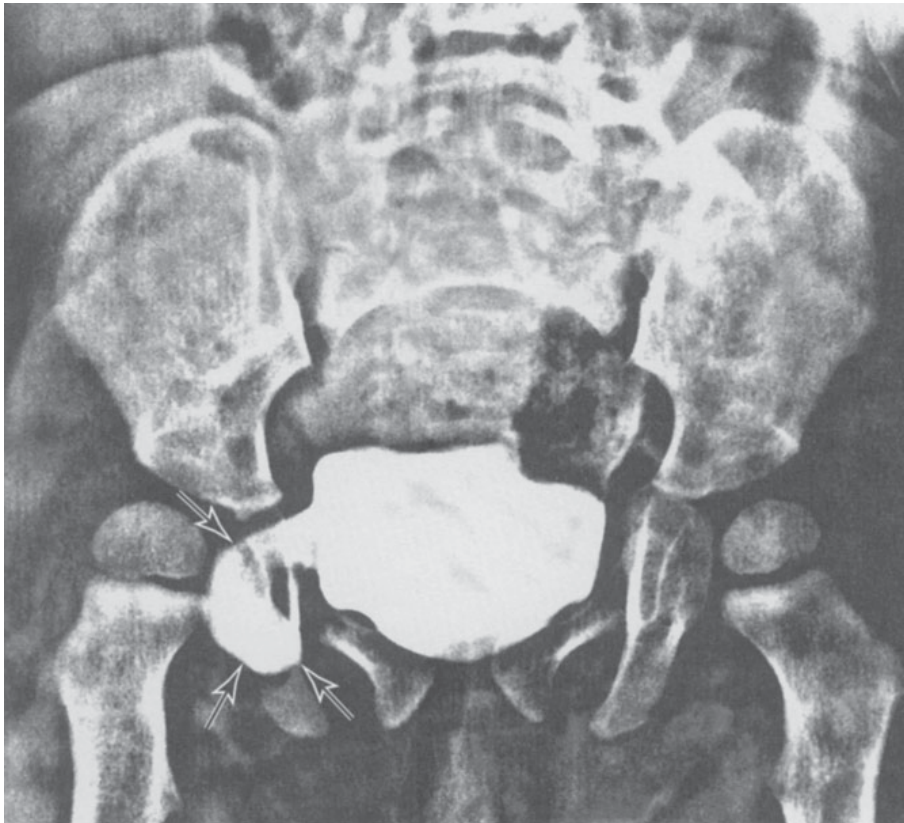
Surgical removal of infected source (such as stone) is needed to treat bacterial persistence.

In most cases of bacterial reinfection, medical management with prophylactic antibiotic is indicated with low dose continuous antibiotic is effective, intermittent self-start antibiotic can be applied. Alternatives to antibiotic therapy includes lactobacillus vaginal suppositories and cranberry juice.



## INTERNAL VESICAL HERNIATION

- ❑ One side of the bladder may become involved in an inguinal hernia (in men) or a femoral hernia (in women).
- ❑ Open or laparoscopic surgery with mesh repair is required .



## Carcinoma of the bladder

- Bladder cancer is the second most common cancer of the genitourinary tract.
- The male to female ratio is 3:1.
- The average age at diagnosis is 65 years.

- At presentation, 75% of bladder cancers are localized to the bladder; 25% have spread to regional lymph nodes or distant sites.
- An initiator or its metabolite induces an alteration in a single normal cell's DNA, which allows its transformation into a malignant cell.
- Promoters bind to receptors on the cell surface to cause already transformed cells to proliferate.

#### Risk factors

- Cigarette smoking .
- Occupational exposures.
- Cyclophosphamide use.
- Physical trauma.
- Genetic predisposition.

#### Histopathology

- Transitional cell carcinoma.
- Carcinoma in situ( CIS).
- Adenocarcinoma.
- Squamous cell carcinoma.
- Undifferentiated carcinomas.
- Mixed carcinoma.

#### Clinical Findings

##### 1. Symptoms:

- Hematuria is the presenting symptom in 85–90% of patients.
- Vesical irritability: frequency, urgency, and dysuria.

- Symptoms of advanced disease include bone pain from bone metastases or flank pain from retroperitoneal metastases or ureteral obstruction.

## 2. Signs:

- No signs in early disease.
- Palpable pelvic mass ,hepatomegaly & supraclavicular lymphadenopathy in advanced disease.

## Laboratory tests

- Urinalysis
- Azotemia
- Anemia
- Imaging studies :
- Abdominal US.
- CT scan & MRI of abdomen.
- Chest x- ray.
- Bone scan.
- Cystourethroscope.
- Bimanual examination under anesthesia.

## Treatment

- Treatment options are made after staging.
- They depend on : tumor stage, grade,size,multiplicity, recurrence pattern.
- Natural history is defined by tumor progression & recurrence.
- TURT transurethral resection of tumor

- Tis Ta T1 TUR + intravesical immunotherapy BCG or chemotherapy Mitomycin C weekly for 6 week then Follow up cystoscopy for residual recurrent and progression (more T) .

- Patients with low-risk Ta tumours should undergo cystoscopy at three months. If negative, subsequent cystoscopy is advised nine months later, and then yearly for five years.
- Patients with high-risk T1 tumours should undergo cystoscopy and urinary cytology at three months. If negative, subsequent cystoscopy and cytology should be repeated every three months for a period of two years, and every six months thereafter until five years, and then yearly.
- EUA guide lines

- T2-T4 Radical Cystectomy + urine diversion . Alternative are partial cystectomy or definitive radiotherapy.

- Any T, N+,M+ Systemic chemotherapy + selective surgery or irradiation.

**Ta:** Non-invasive papillary carcinoma

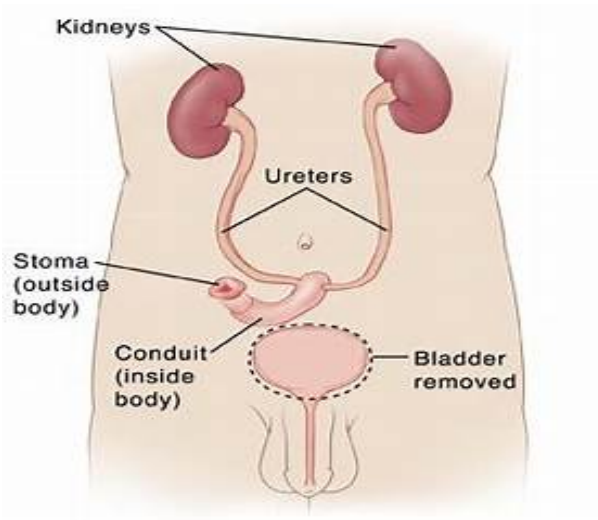
**Tis:** Non-invasive flat carcinoma (flat carcinoma in situ, or CIS)

**T1:** The tumor has grown from the layer of cells lining the bladder into the connective tissue below. It has not grown into the muscle layer of the bladder.

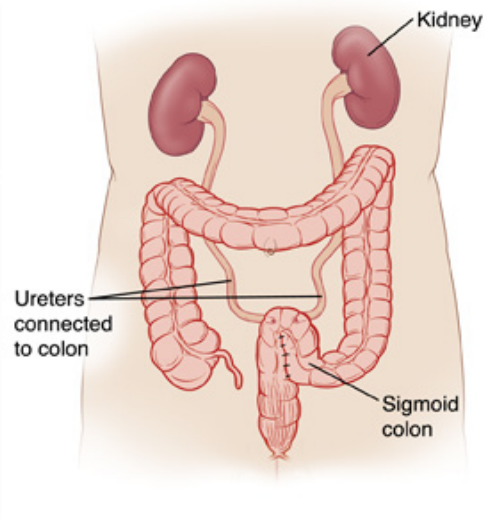
**T2:** The tumor has grown into the muscle layer.

**T3:** The tumor has grown through the muscle layer of the bladder and into the fatty tissue layer that surrounds it.

**T4:** The tumor has spread beyond the fatty tissue and into nearby organs or



**ileal conduit**



**ureterosigmoidostomy**

# Orthotopic Neobladder

- Reservoir created from detubularized bowel which is anastomosed to the native urethra
- Relies upon natural sphincter muscles to maintain continence
- Facilitates restoration of normal voiding mechanism and maintains patient self-image
  - Gaining popularity
  - Requires careful patient selection
    - Contraindicated if urethra is non-functional or involved with tumor
    - Requires active patient training/participation to ensure full return of spontaneous voiding

