

Overview of Excretory System Disorders

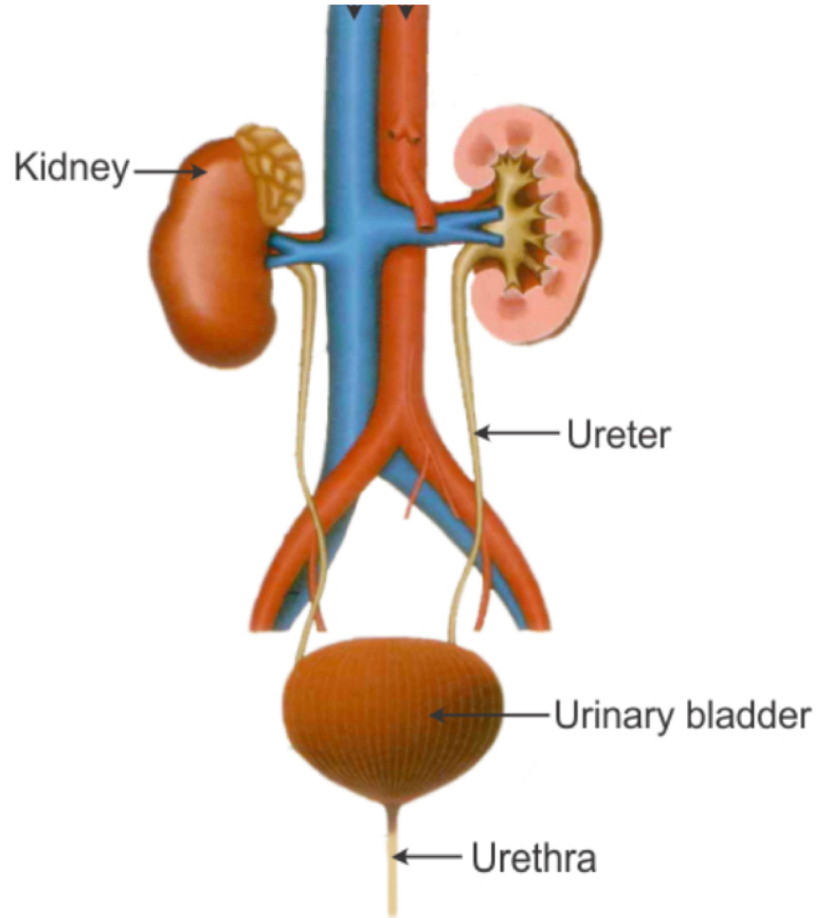
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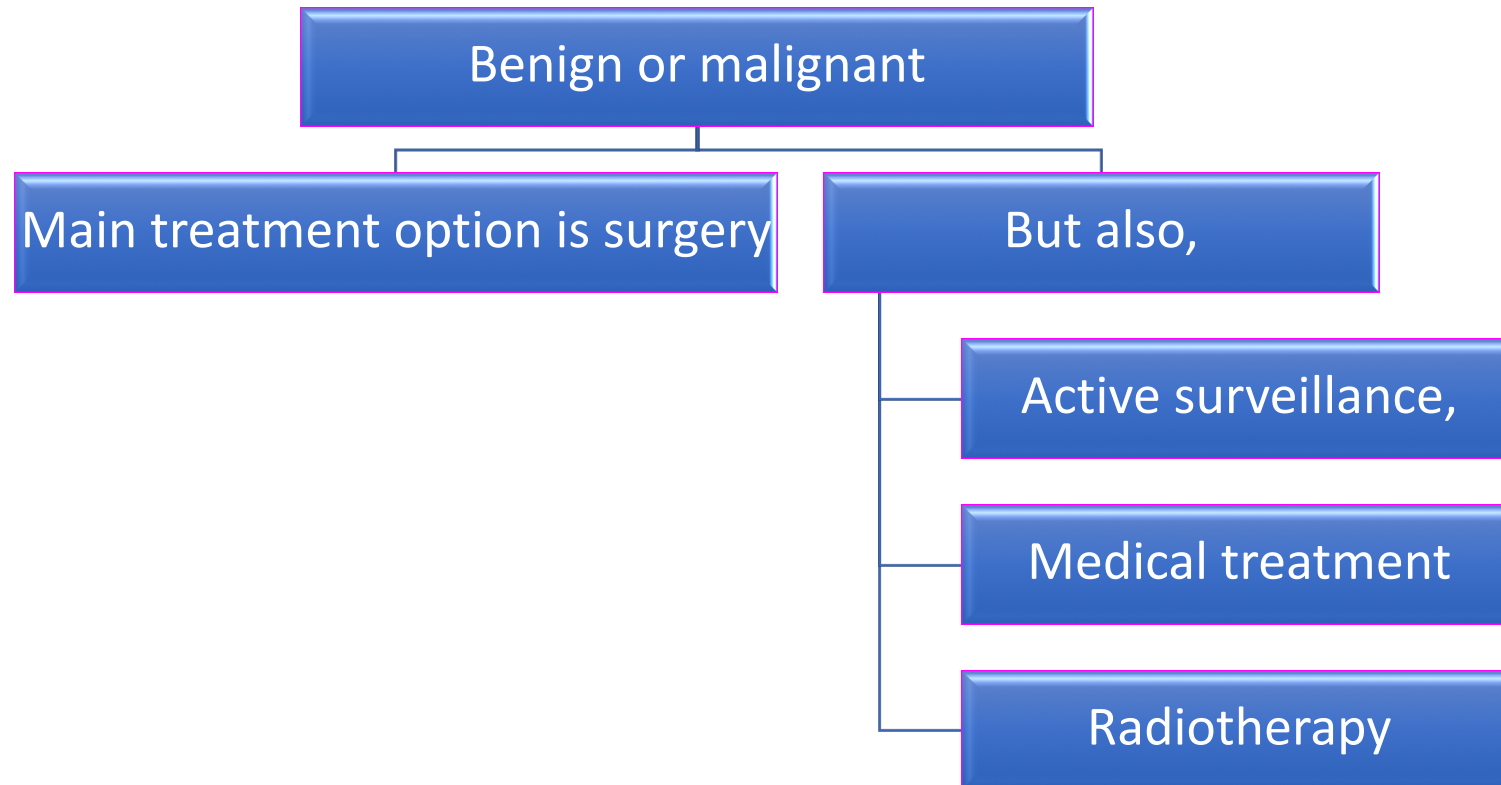
Urology



- Parenchymal: Kidney and prostate
- Luminal: Ureter, bladder and urethra

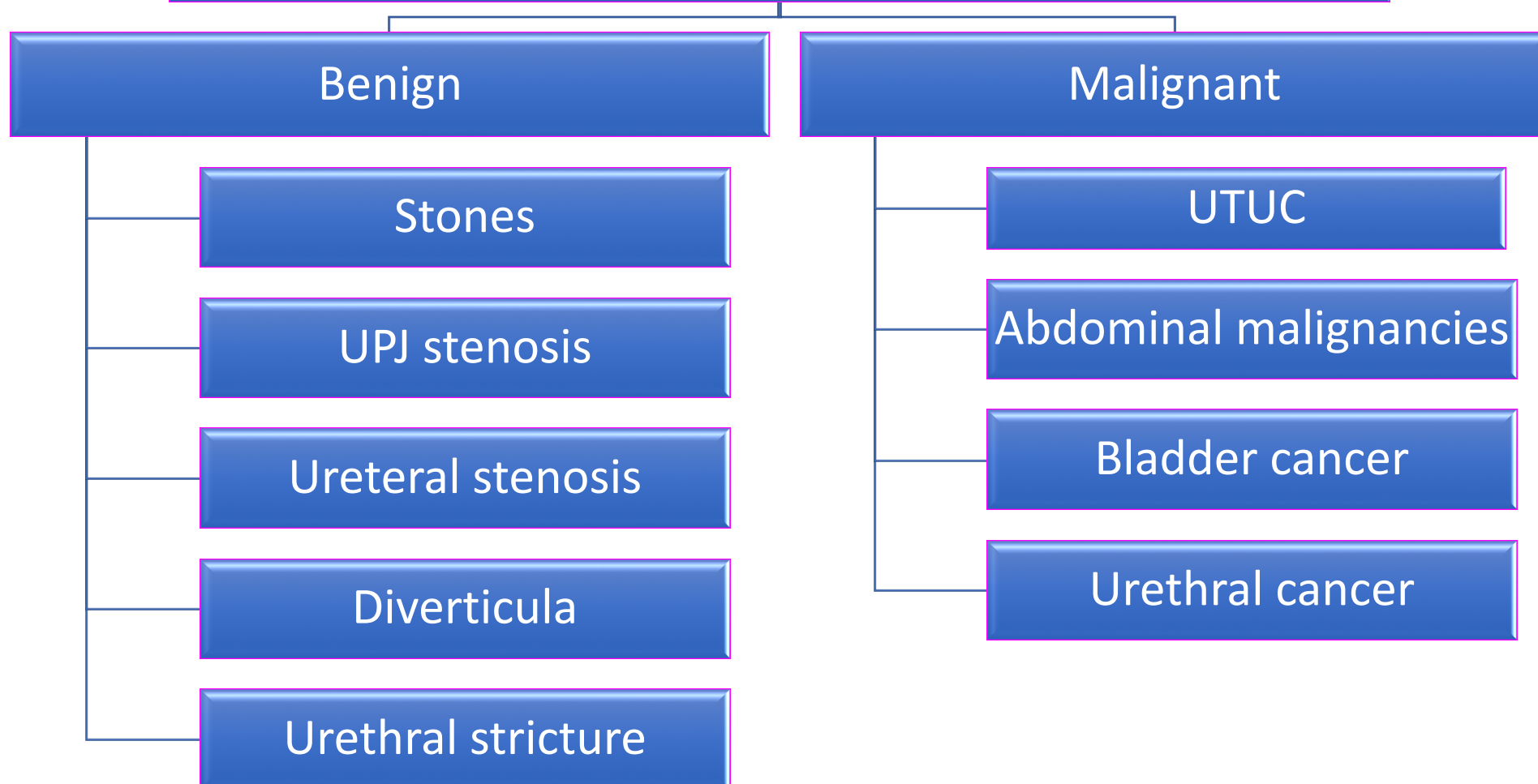
Overview – Urologist point of view

Parenchymal pathologies: Mainly Tumors



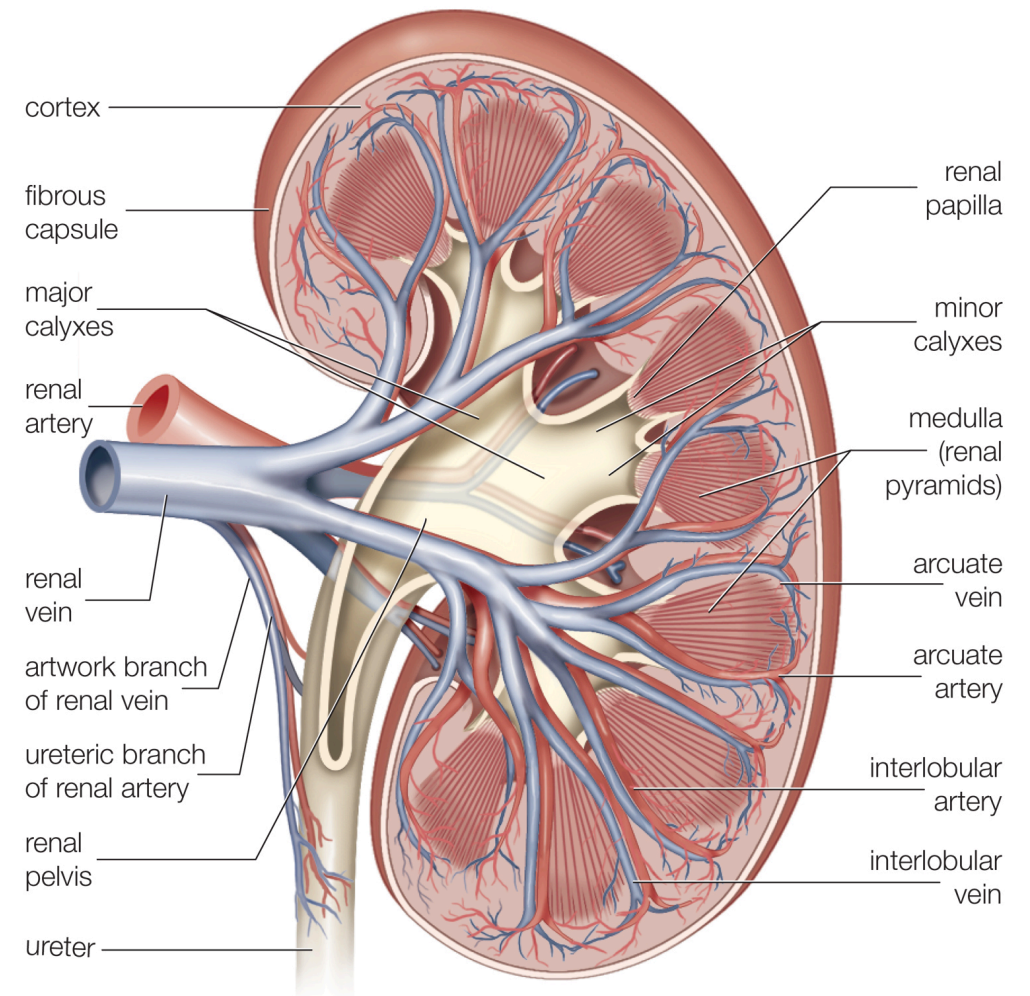
Overview – Urologist point of view

Luminal pathologies: Obstruction!!!



Kidney

- Both parenchymal and luminal pathologies
- Kidney: Parenchyma + Collecting system
- Highly vascular
- Urothelium lines the entire collecting system



Kidney Tumors

- Benign or malignant
- Renal cell carcinomas (RCCs), which originate within the renal cortex, constitute 80 to 85 percent of primary renal neoplasms.
- Other parenchymal epithelial tumors, such as
 - Oncocytomas,
 - Collecting duct tumors, and
 - Renal sarcomas, are rare.

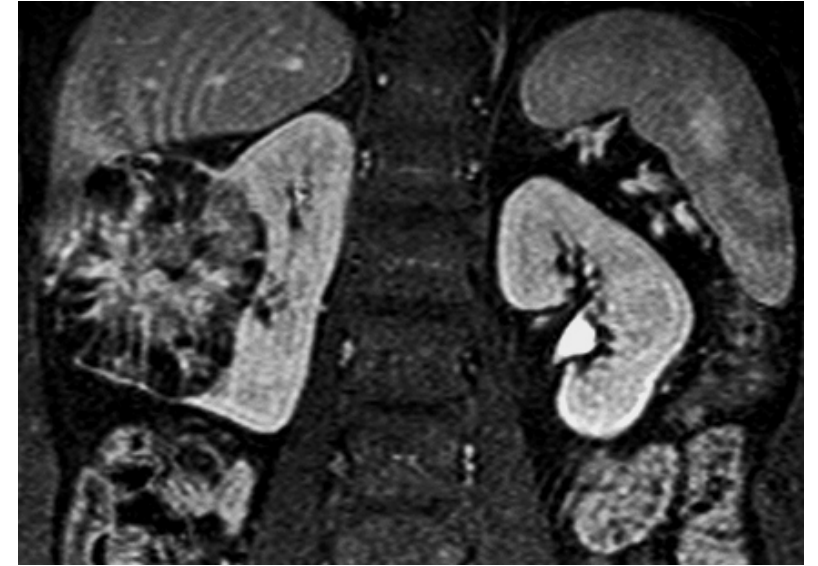


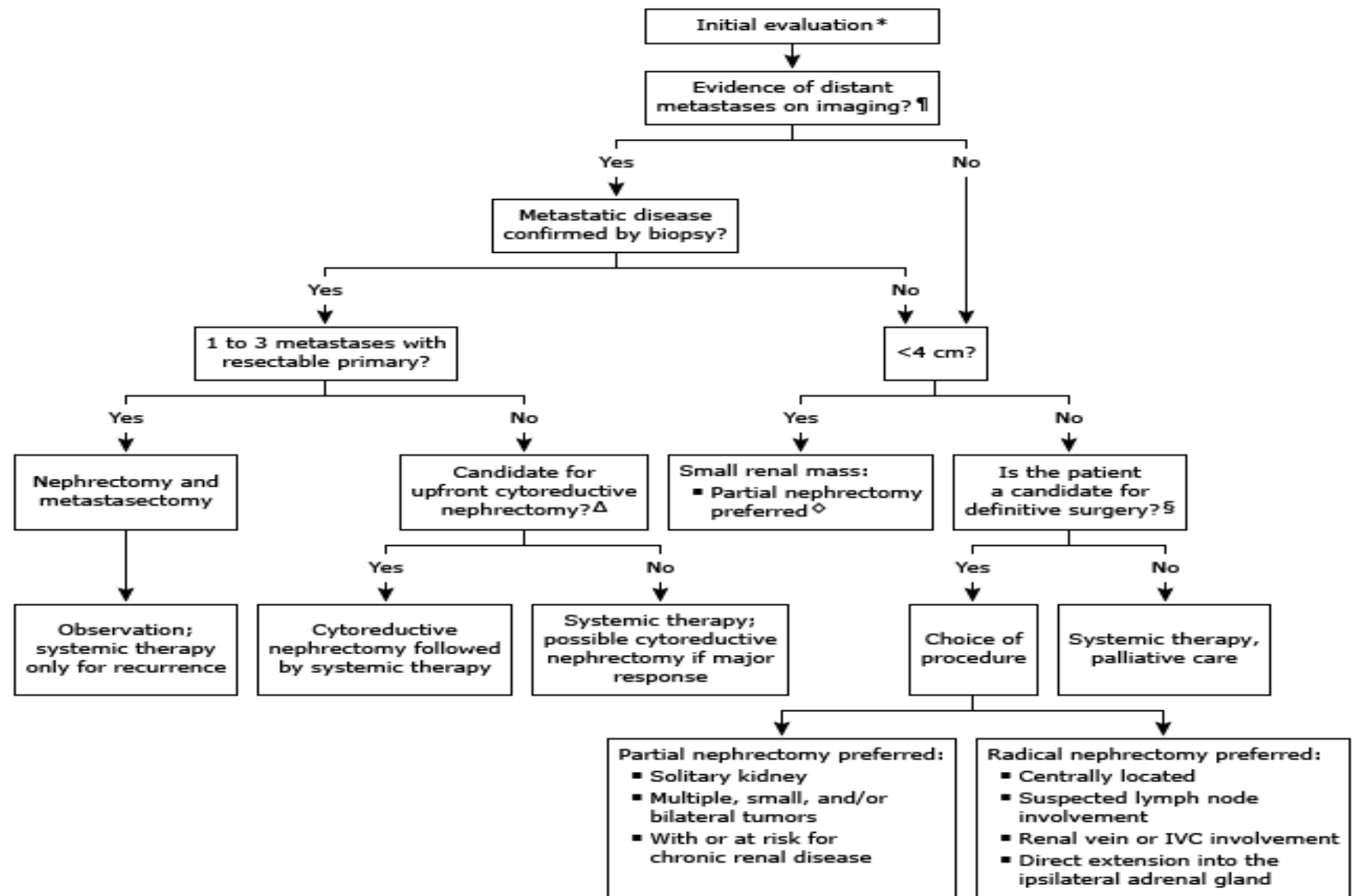
CLINICAL MANIFESTATIONS

- Patients with RCC can present with a range of symptoms;
- Many patients are asymptomatic
- At presentation, approximately 25 % of individuals either have distant metastases or advanced locoregional disease
- The classic triad of RCC
 - Flank pain,
 - Hematuria,
 - A palpable abdominal renal mass
- Occurs in at most 9 percent of patients; when present, it strongly suggests locally advanced disease

Staging and treatment of RCC

- TNM classification
- Treatment: Surgery – for localized disease
 - Radical nephrectomy
 - Partial nephrectomy
- Open, laparoscopy or robot assisted laparoscopic surgery
- Metastatic disease: Systemic therapy
- No Chemotherapy and No radiotherapy!!!
- Targeted therapies



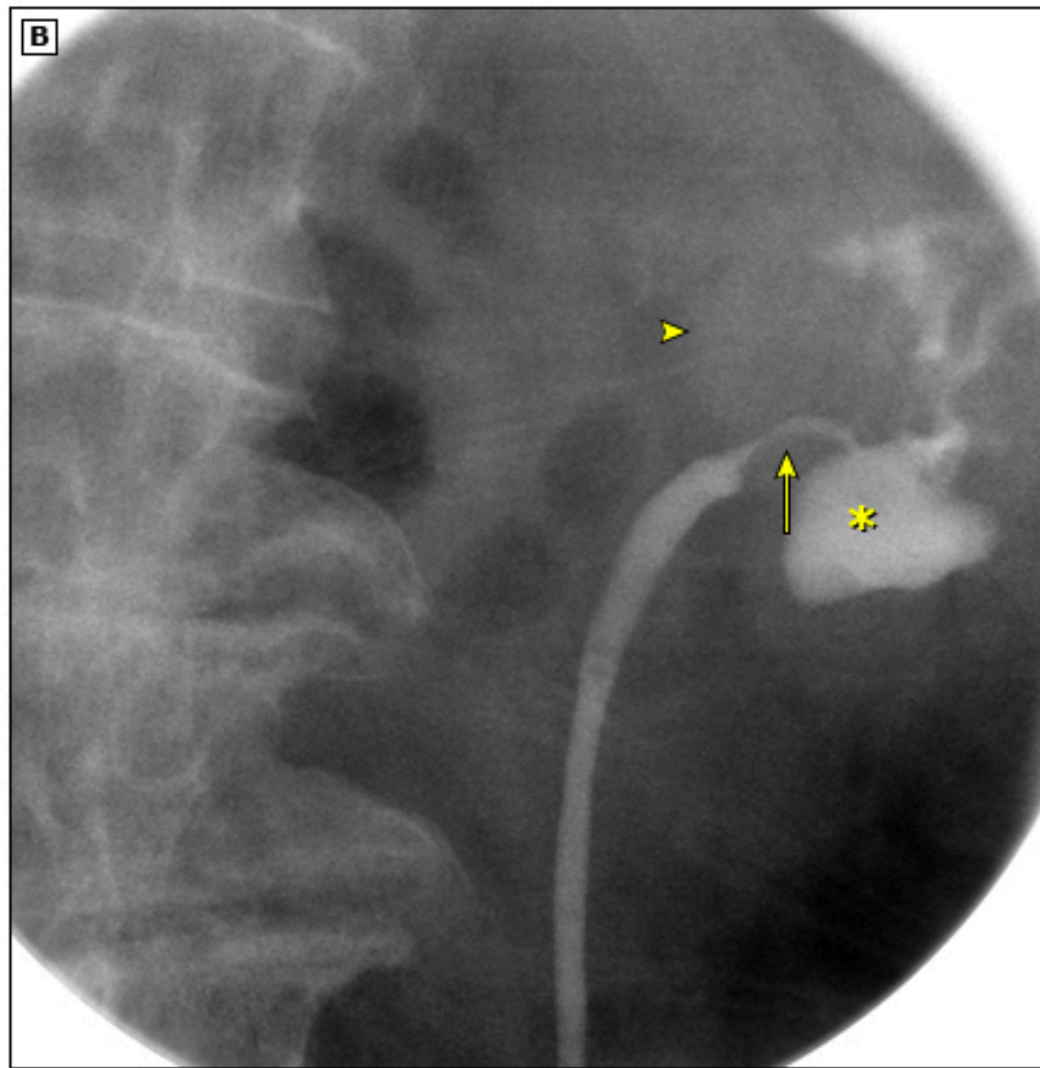
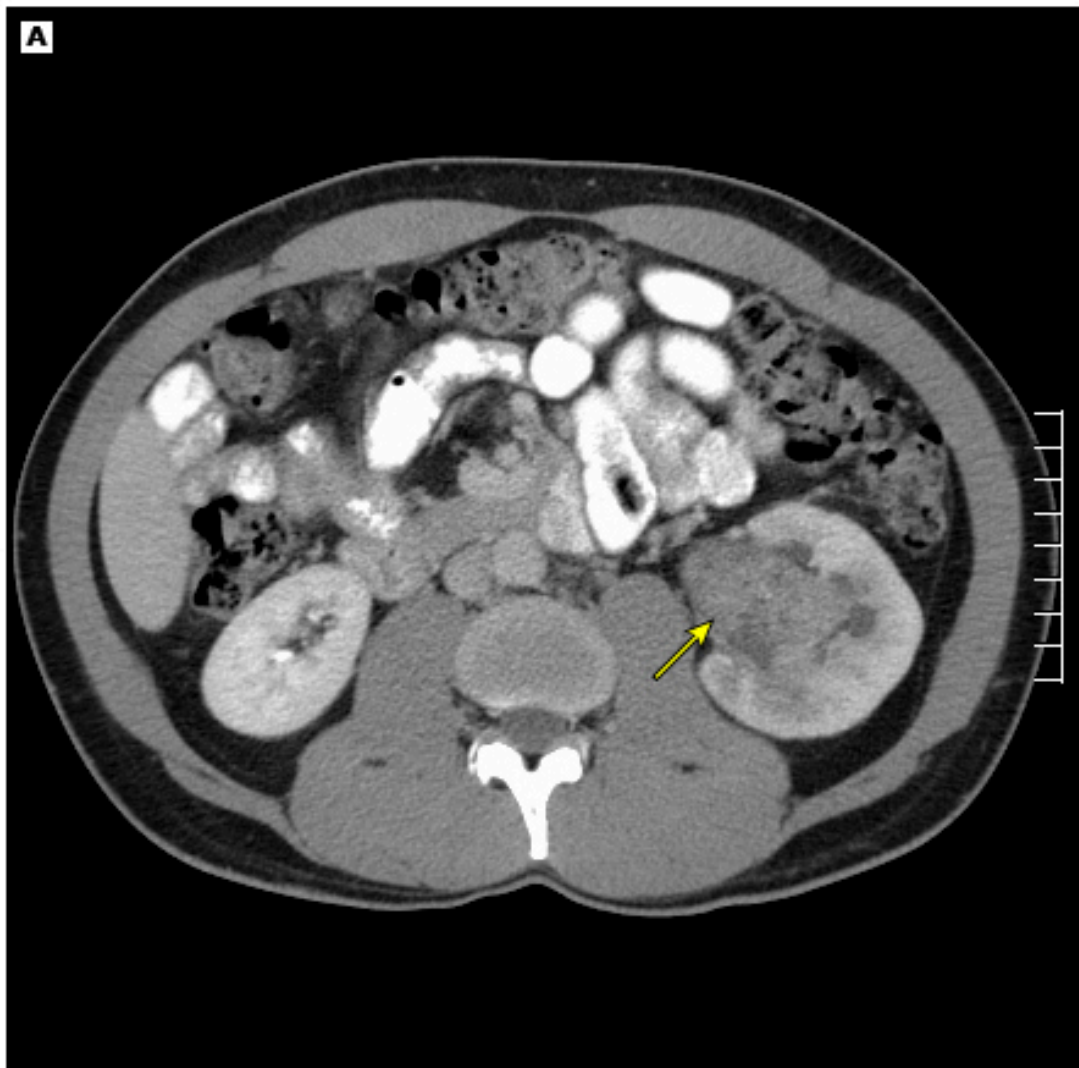


The mucosal surfaces of:

- Renal collecting tubules
 - Calyces
 - Pelvis
 - Ureter
 - Bladder
 - Urethra
-
- All have the same embryologic origin, and the term "urothelium" is used to delineate the lining surface epithelium

Upper tract urothelial carcinoma

- Urothelial (also called transitional cell) carcinomas of the upper urinary tract, bladder, and urethra tend to be multifocal.
- **Clinical presentation**
 - Hematuria is present at diagnosis in 70 to 80 percent of patients.
 - Obstruction of the ureter or ureteropelvic junction due to a tumor mass causes flank pain in 20 to 40 percent of cases.
 - Other urinary tract symptoms, such as those associated with bladder irritation, and constitutional symptoms occur in less than 10 percent of cases



Treatment

- Nephroureterectomy
- AND excision of a cuff of normal bladder and bladder mucosa is the gold standard
- Less extensive procedures
 - Endourologic surgery
 - Segmental ureterectomy
- Appropriate for patients with localized low-grade lesions

Stones

- Crystal deposits formed in the kidneys
- Mainly cause obstruction



CLINICAL MANIFESTATIONS

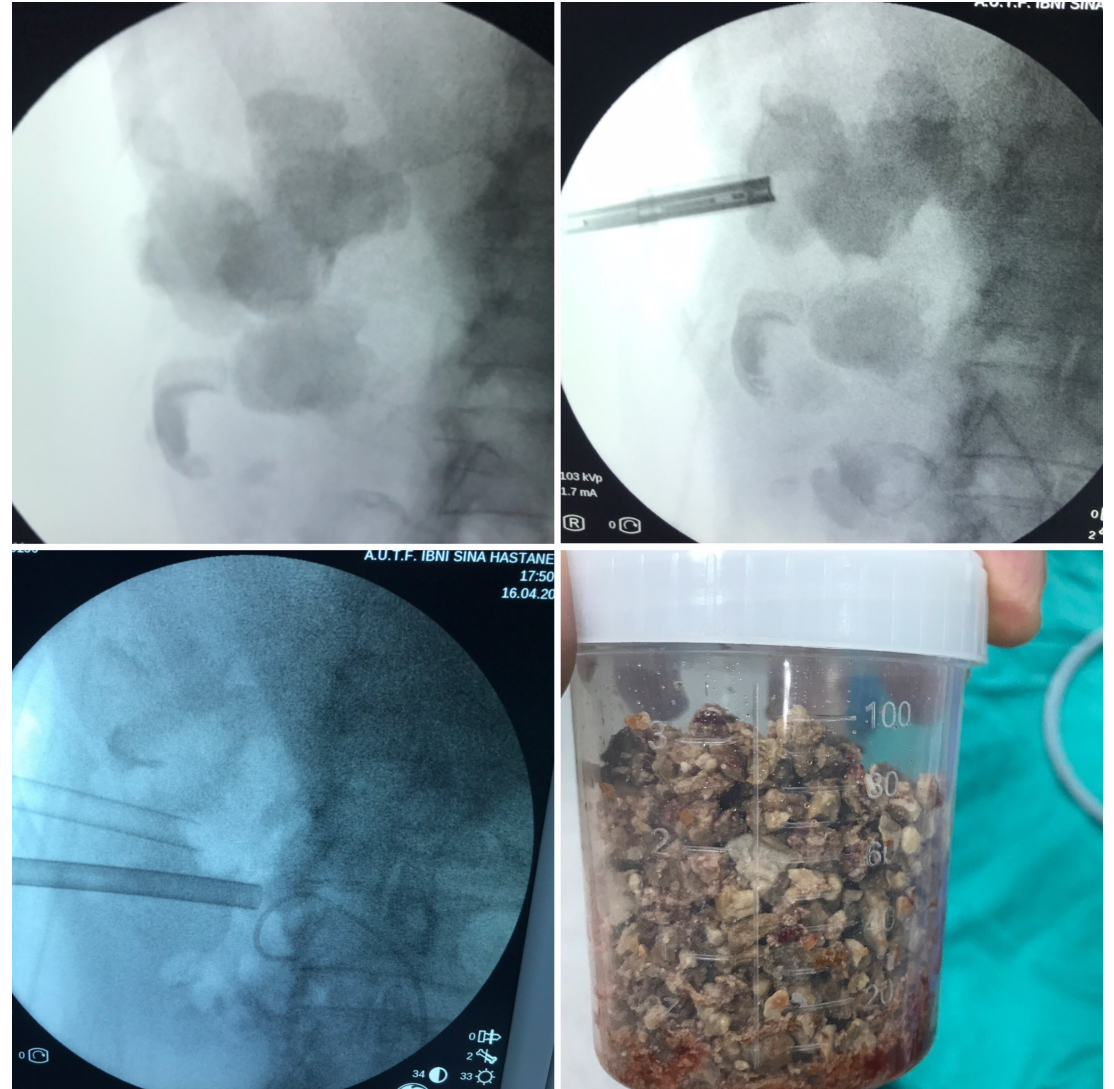
- Symptoms develop when stones initially pass from the renal pelvis into the ureter.
- Pain is the most common symptom
- The pain typically waxes and wanes in severity and develops in waves or paroxysms.
- Paroxysms of severe pain usually last 20 to 60 minutes.
- Pain is thought to occur primarily from urinary obstruction with distention of the renal capsule.
- Consequently, pain due to a kidney stone typically resolves quickly after passage of the stone.

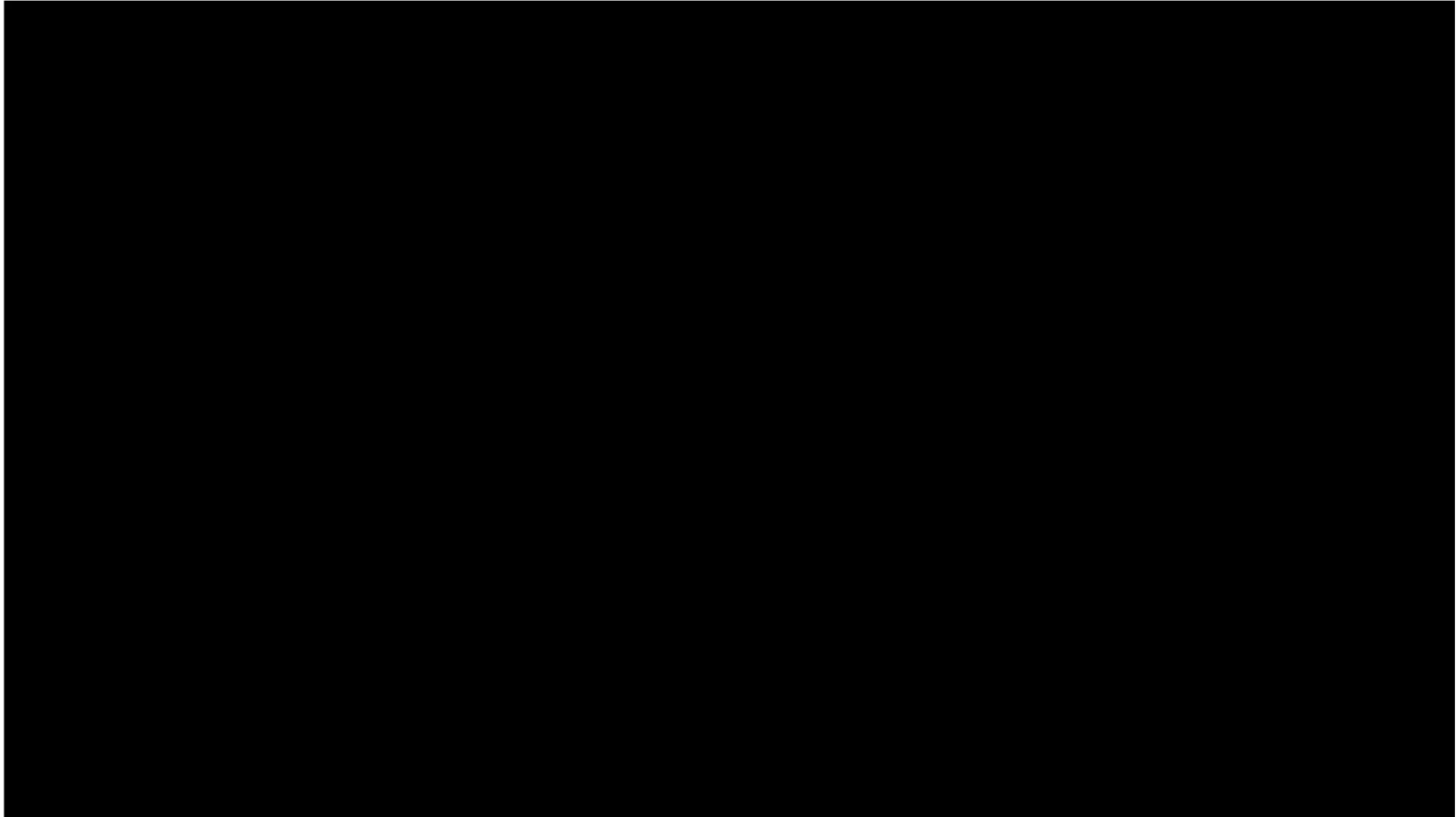
DIFFERENTIAL DIAGNOSIS

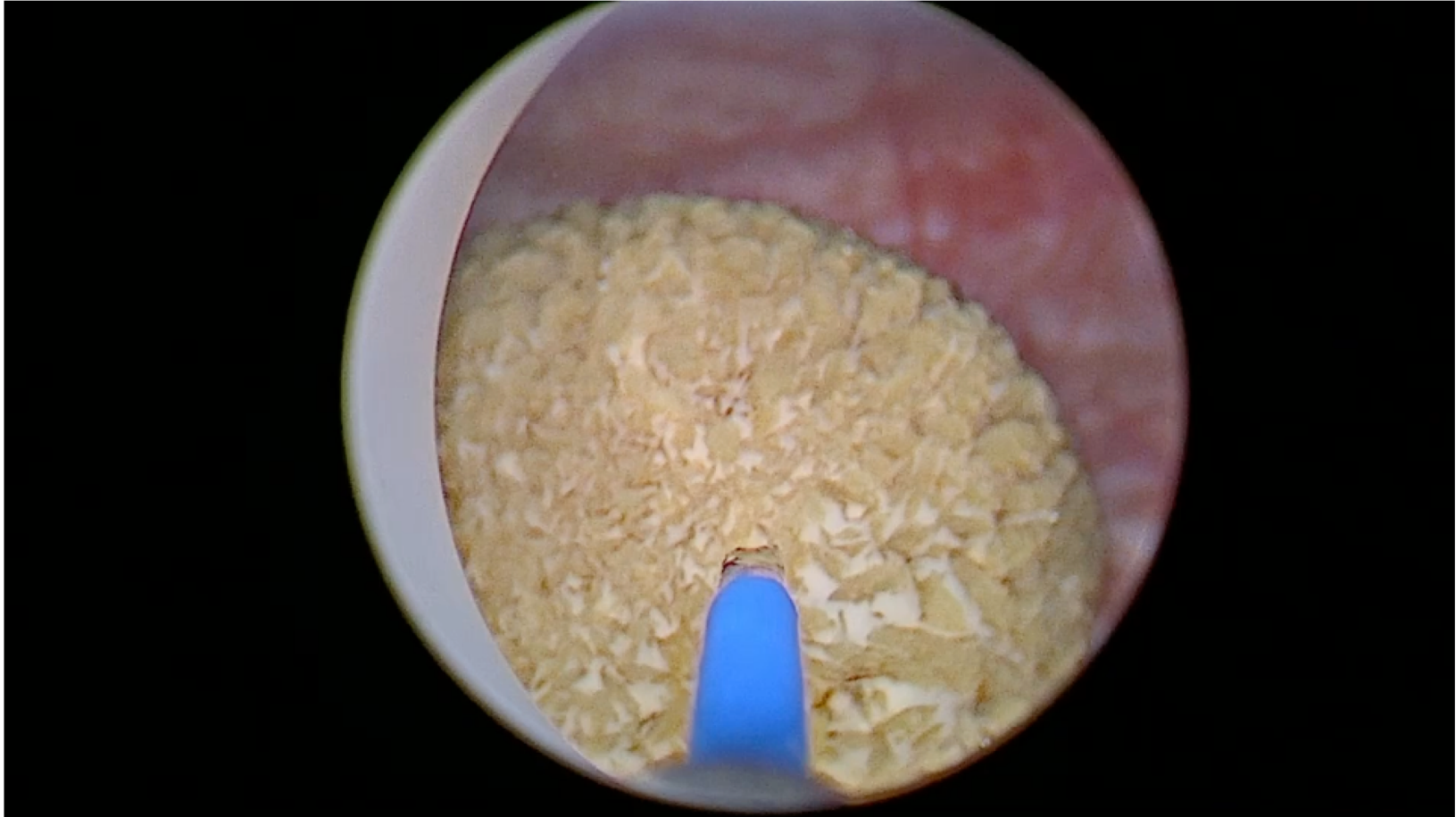
- Hematuria – different etiologies
- Pyelonephritis: frequently presents with flank pain, fever, and pyuria
- Pain due to an ectopic pregnancy can occasionally be mistaken for renal colic.
- Rupture or torsion of an ovarian cyst may present with flank pain
- Acute intestinal obstruction or appendicitis
- Herpes zoster may produce pain in the flank but is usually accompanied by a rash

Treatment

- Spontaneous passage
- SWL
- Ureterorenoscopy
- RIRS
- Percutaneous nephrolithotomy

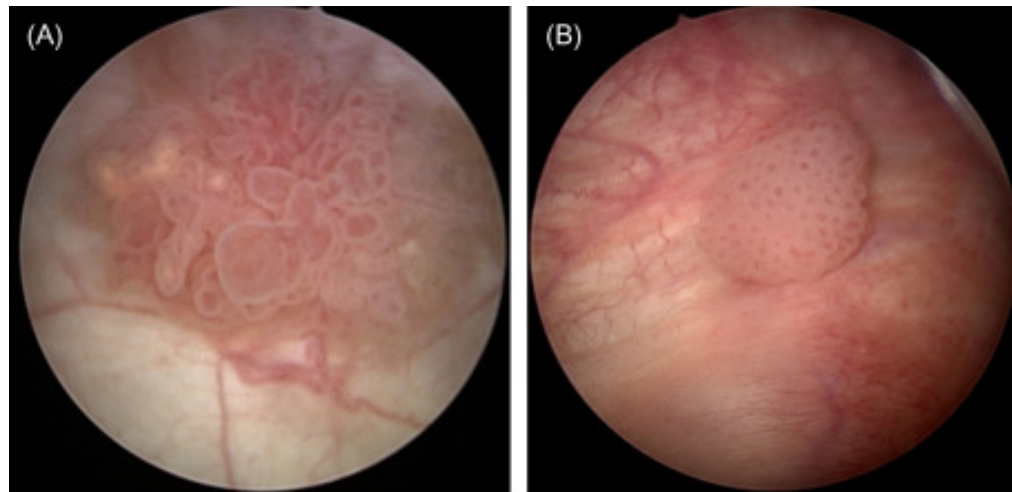






Bladder cancer

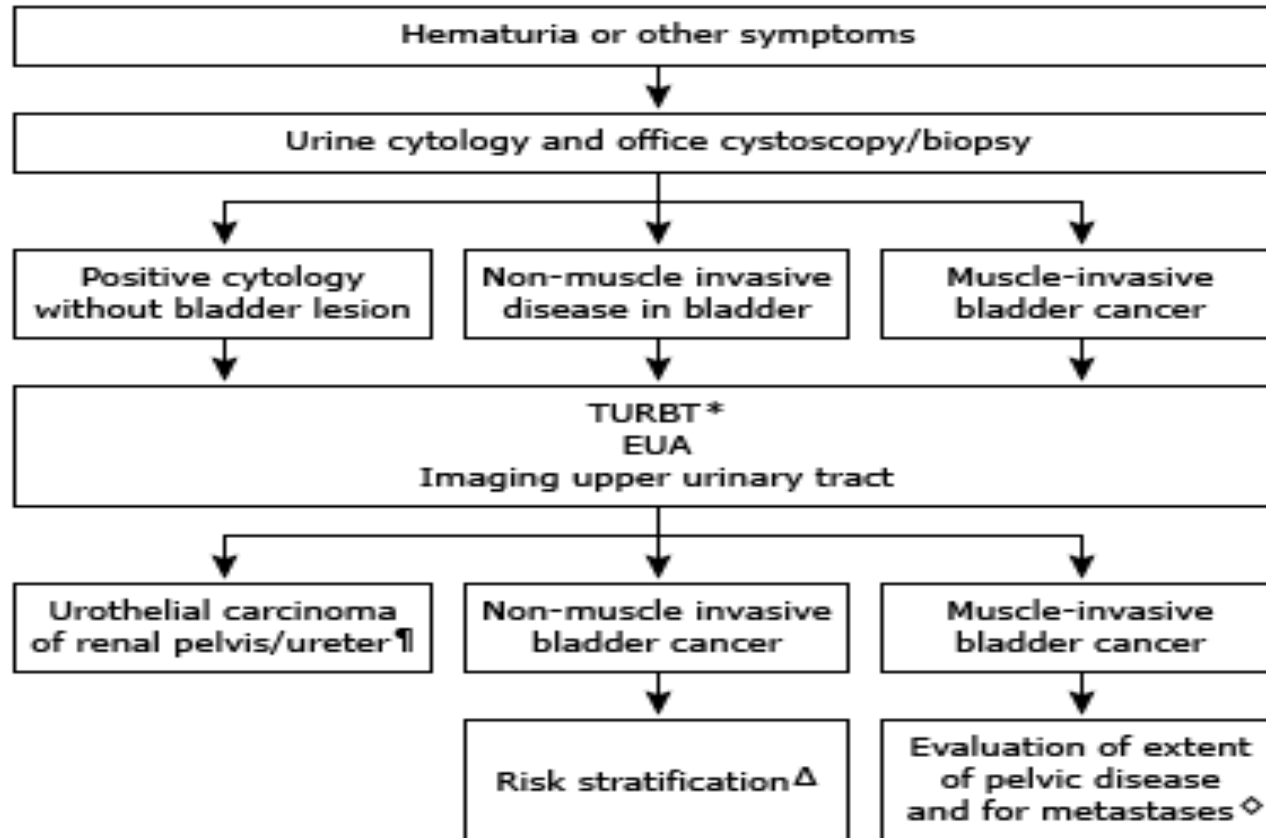
- Bladder cancer is the most common malignancy involving the urinary system.
- Urothelial carcinoma is the predominant histologic type
- The spectrum of bladder cancer includes non-muscle invasive (superficial), Muscle invasive, and metastatic disease



CLINICAL PRESENTATION

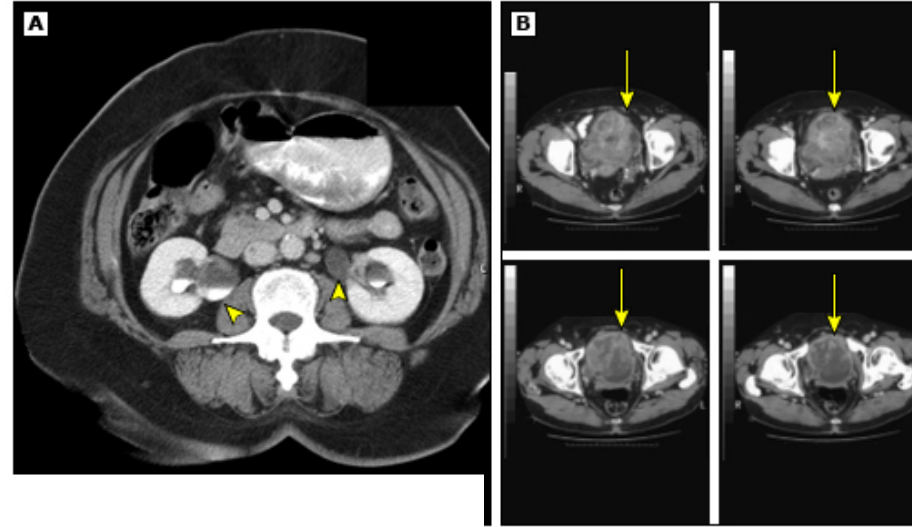
- Patients with bladder cancer classically present with **hematuria**
- Hematuria is typically intermittent, gross, painless, and present throughout micturition.
- Irritative voiding symptoms (frequency, urgency, dysuria) can be the initial manifestation
- **Pain** — Pain associated with bladder cancer is usually the result of locally advanced or metastatic tumors.
- **Flank pain** may result when a tumor obstructs the ureter

Initial approach to suspected bladder cancer



Staging

- CT scan for imaging

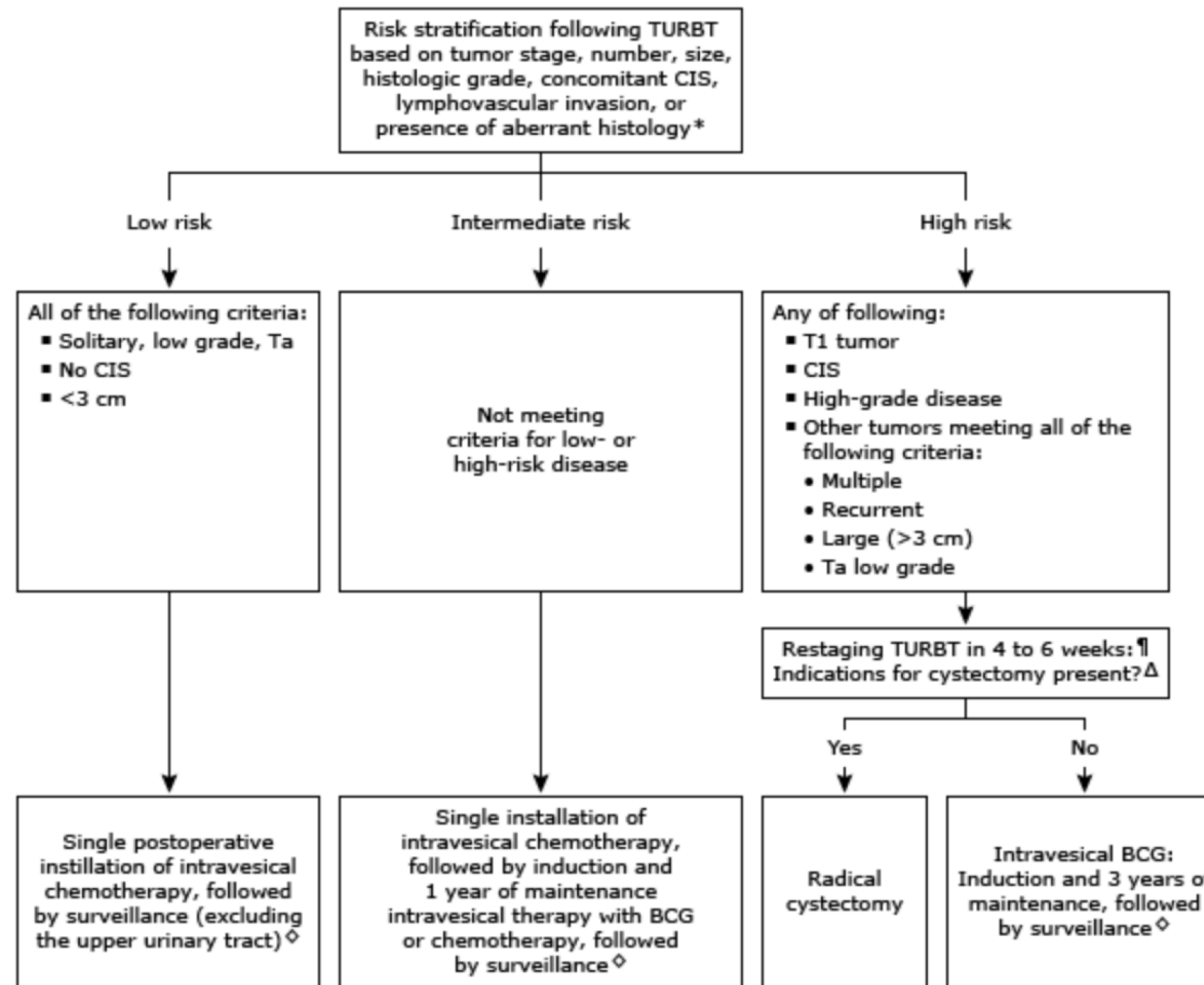


Bladder cancer TNM staging AJCC UICC 8th edition

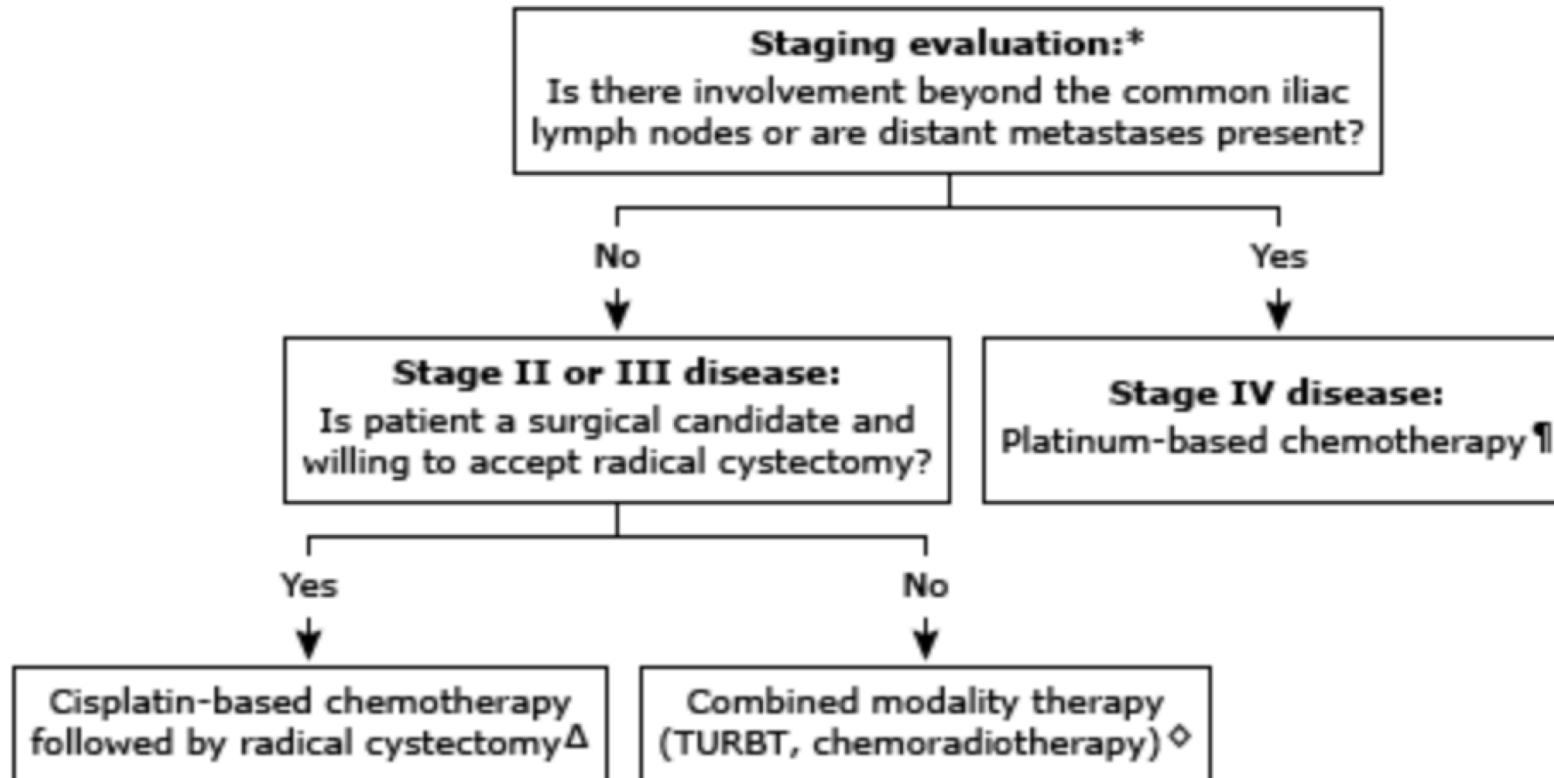
Primary tumor (T)	
T category	T criteria
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Ta	Noninvasive papillary carcinoma
Tis	Urothelial carcinoma <i>in situ</i> : "Flat tumor"
T1	Tumor invades lamina propria (subepithelial connective tissue)
T2	Tumor invades muscularis propria
pT2a	Tumor invades superficial muscularis propria (inner half)
pT2b	Tumor invades deep muscularis propria (outer half)
T3	Tumor invades perivesical soft tissue
pT3a	Microscopically
pT3b	Macroscopically (extravesical mass)
T4	Extravesical tumor directly invades any of the following: Prostatic stroma, seminal vesicles, uterus, vagina, pelvic wall, abdominal wall
T4a	Extravesical tumor invades directly into prostatic stroma, seminal vesicles, uterus, vagina
T4b	Extravesical tumor invades pelvic wall, abdominal wall

Treatment - Depends on the stage

Initial management of non-muscle invasive bladder cancer

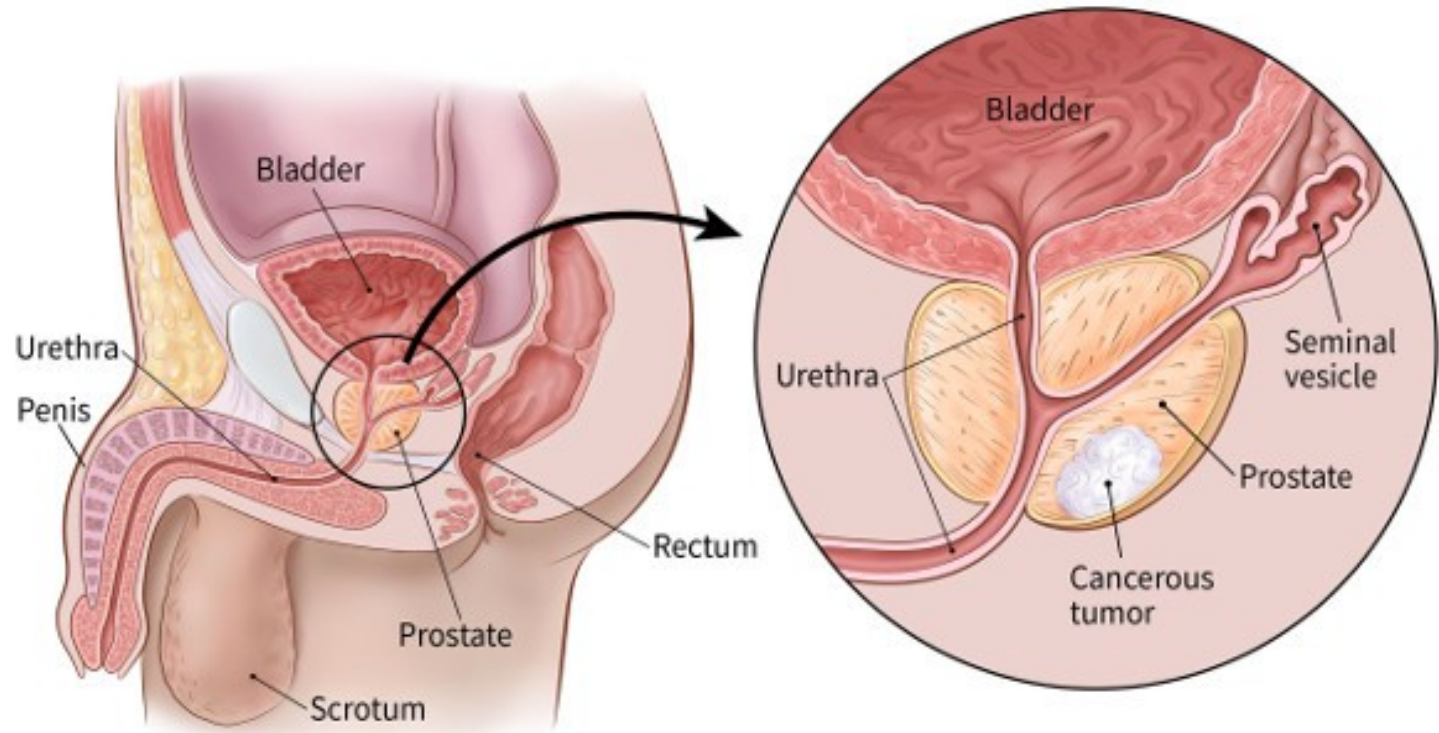


Management of muscle invasive bladder cancer



Prostate pathologies

- BPH and Male LUTS
- Prostatitis
- Prostate cancer



Benign prostatic hyperplasia

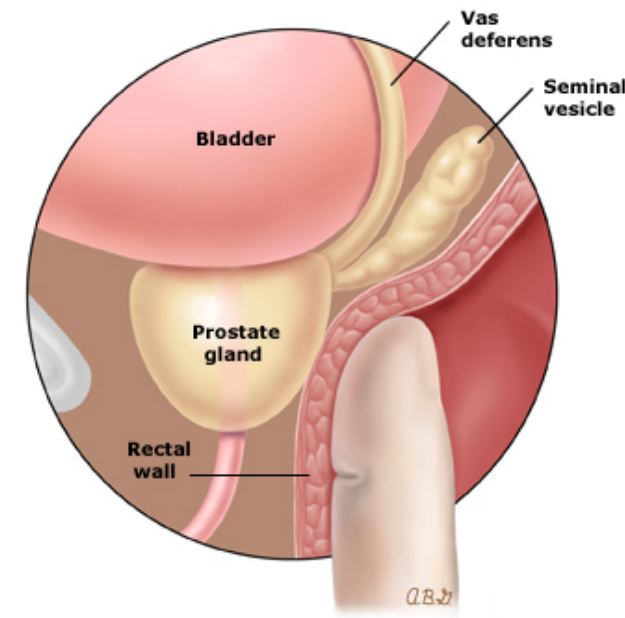
- BPH is a condition that occurs when the prostate gland enlarges, potentially slowing or blocking the urine stream.
- 8 % of men aged 31 to 40 have BPH.
- Over age 80, more than 80 % have BPH.

BPH SYMPTOMS

- The symptoms of BPH usually begin after age 45.
- The most common symptoms of BPH include:
 - Frequent urination, especially at night
 - A hesitant, interrupted, or weak stream of urine
 - The need to urinate frequently
 - Leaking or dribbling of urine

Patient evaluation

- Digital rectal examination
- DRE helps to determine if there are signs of prostate cancer
- Urinalysis: To check for infection or hematuria
- Blood tests: PSA – prostate specific antigen
- Kidney function evaluation !!!



Urodynamic studies

- Uroflowmetry - noninvasive test
- Maximum urine output rate – ml/sec
- Residual urine volume ?

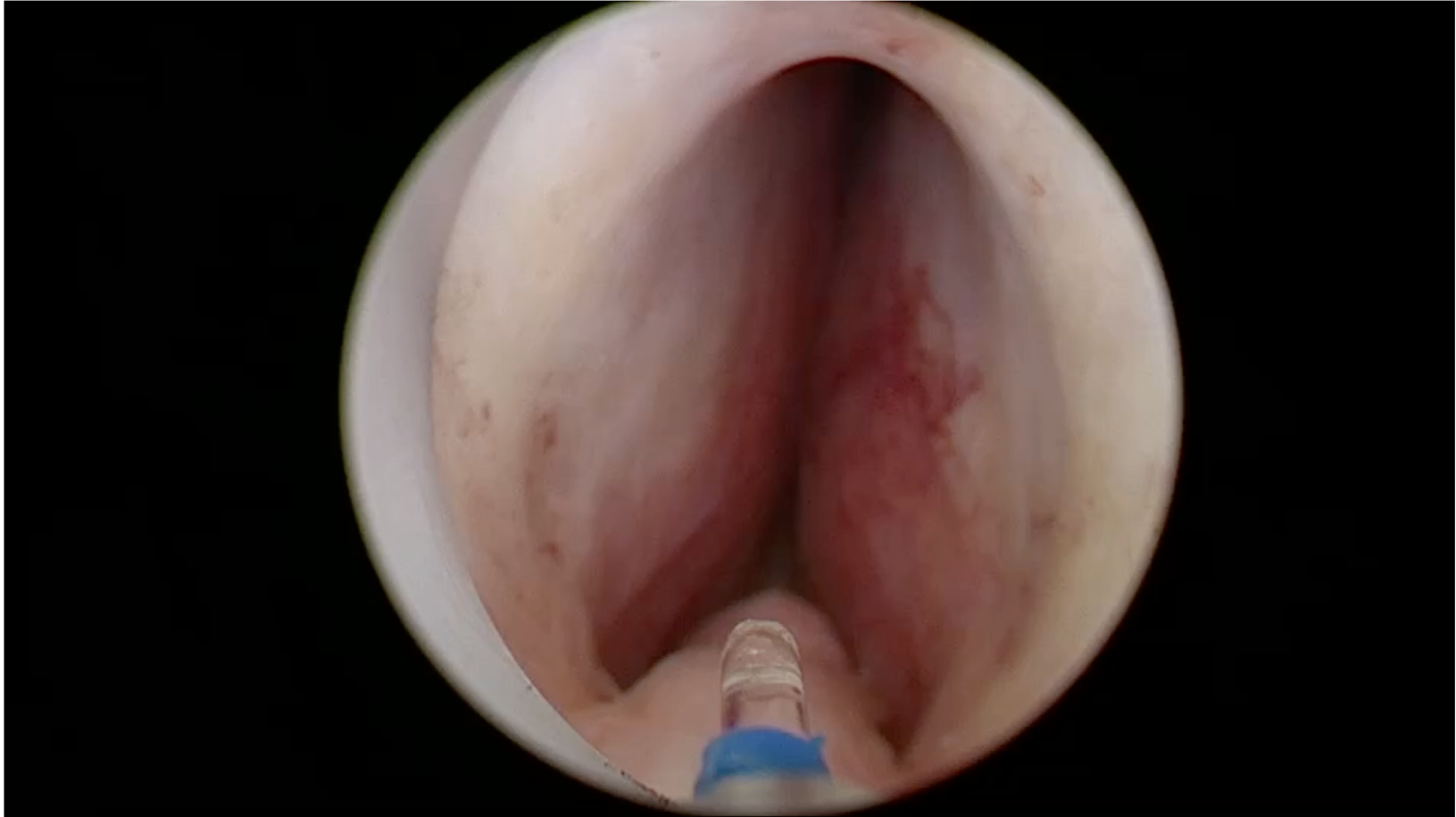
- Invasive urodynamic tests:
 - Pressure – Flow studies

Management

- Lifestyle changes
- Medical management
- [Alpha Blockers: terazosin, doxazosin, tamsulosin, alfuzosin, and silodosin](#)
- Phosphodiesterase inhibitors — [Tadalafil](#)
- Alpha-reductase inhibitors - [Finasteride](#) and [Dutasteride](#)
- Herbal medicines

Surgical management

- Transurethral resection of the prostate (TURP)
- Laser ablation or enucleation
- Photoselective vaporization (PVP) and
- Holmium laser enucleation of the prostate (HoLEP)
- Thulium laser enucleation of the prostate THuLEP
- Open – robotic – laparoscopic adenectomy



Prostate cancer

- Prostate cancer is among the most common cancers in men worldwide
- Symptoms — It is rare for patients to present with symptoms attributable to prostate cancer.
- Most prostate cancers are diagnosed in the local stage and are asymptomatic.
- Mainly diagnosis related to PSA screening

Diagnosis

- Prostate biopsy
- Transrectal ultrasound guided or perineal needle biopsy
- Biopsy is reported with Gleason Score
- A higher score is related to poor prognosis
- Staging is performed with TNM system

Treatment

- Localized and locally advanced disease
 - Active surveillance
 - Radical prostatectomy
 - Open
 - Robot assisted laparoscopy
 - Radiation therapy
- Metastatic disease
 - Hormonal therapies
 - Chemotherapy

Summary,

- Urology deals with the medical and surgical treatment of excretory system disorders
- The pathologies may either develop from the parenchymal organs or luminal organs
- Successful management requires
 - Meticulous diagnostic interventions
 - Multi-disciplinary approach (Nephrology – Radiology – Pathology – Oncology)
- Developing technologies aid us in providing the best care for our patients.

Thank you