

# *Urinary bladder*

## *Diseases of the bladder :*

- ***Congenital anomalies***
- ***Inflammation***
- ***Neoplasms***

# ***Congenital anomalies***

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***Diverticula***

***Exstrophy***

# ***Bladder/Vesical Diverticulum***

- ***Pouch-like evagination of the bladder wall.***
- ***Consists of round to ovoid, saclike pouch (1-10cm).***
- ***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.***

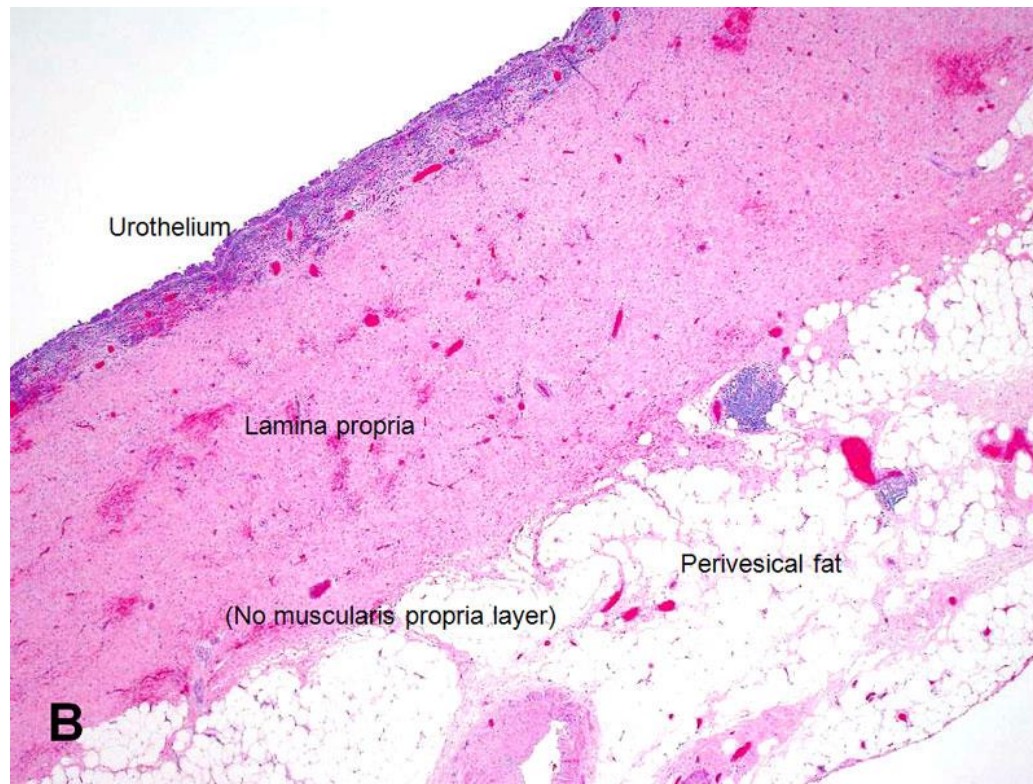
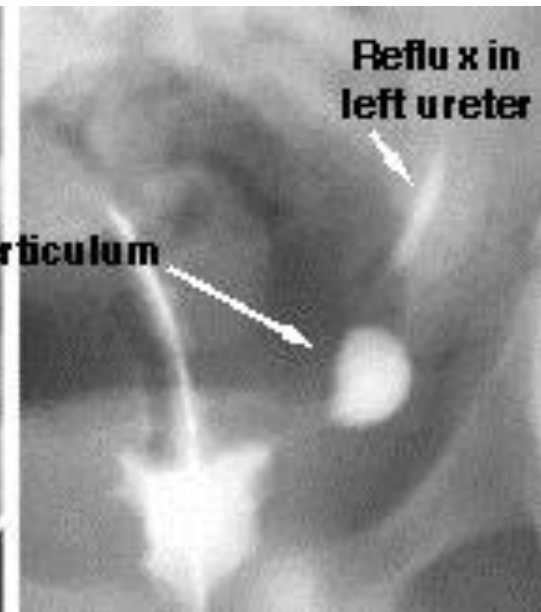


***Increased intravesical pressure***



***Outpouching of the bladder wall***

***Formation of diverticula.***



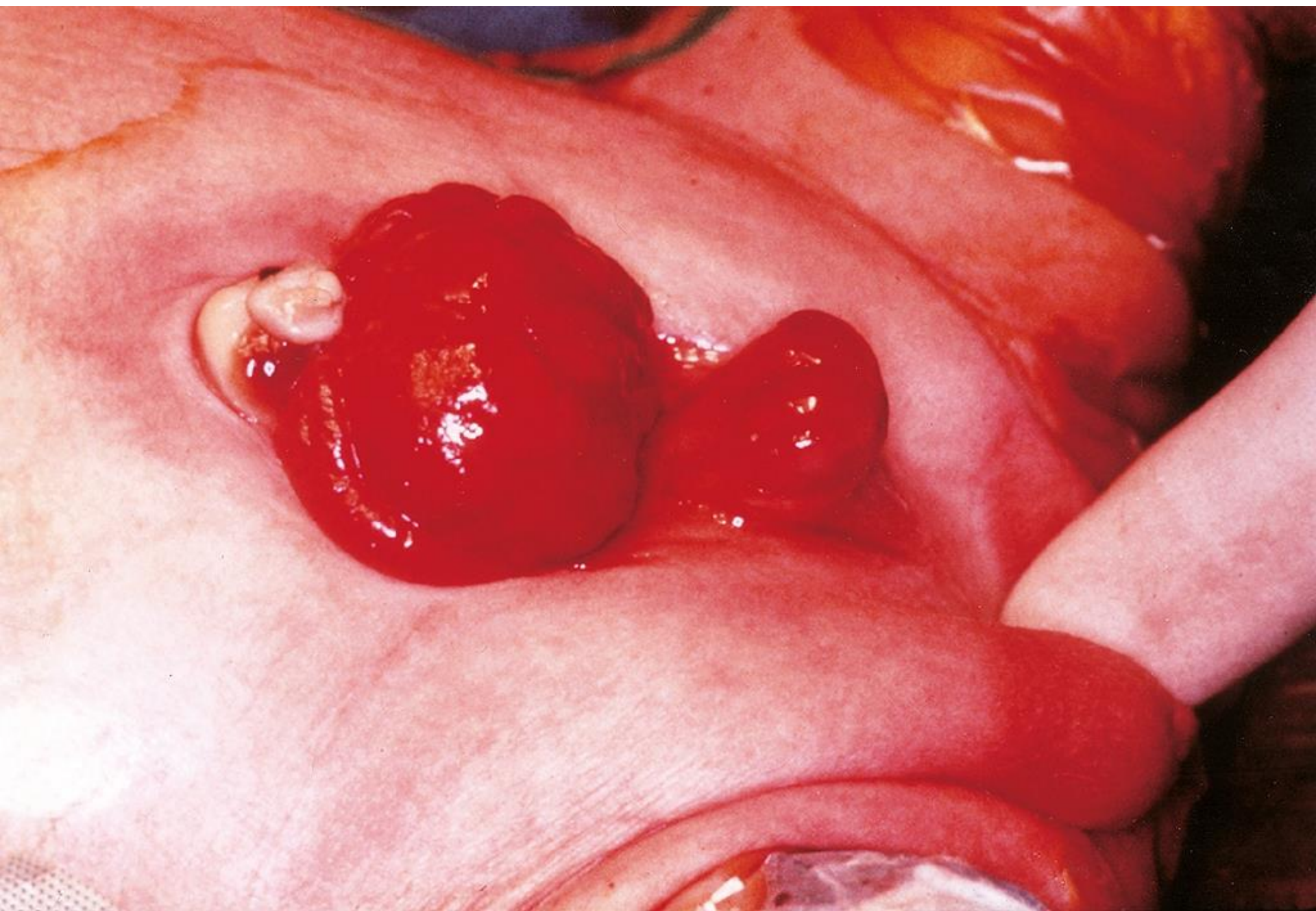
# ***Bladder/Vesical Diverticulum***

- ***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.***

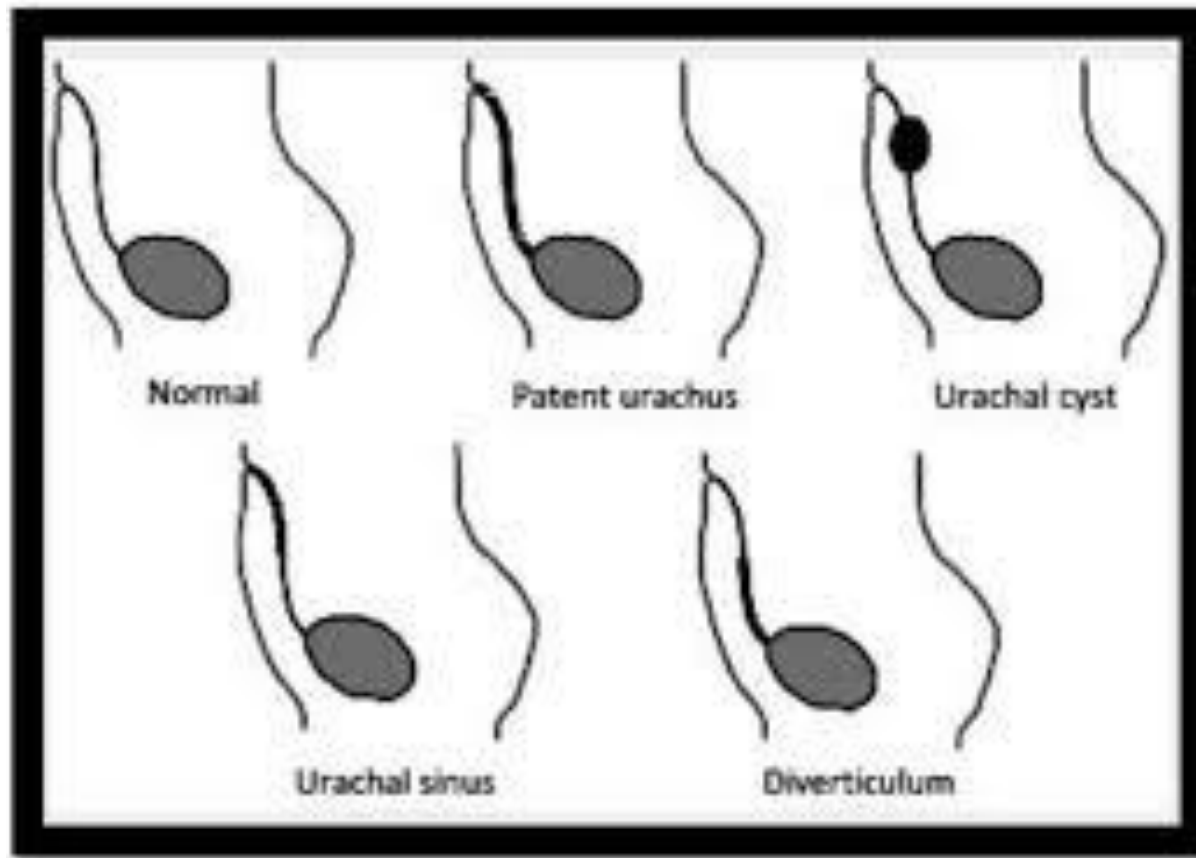
# ***Exstrophy of the bladder***

- ***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.***



# *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*

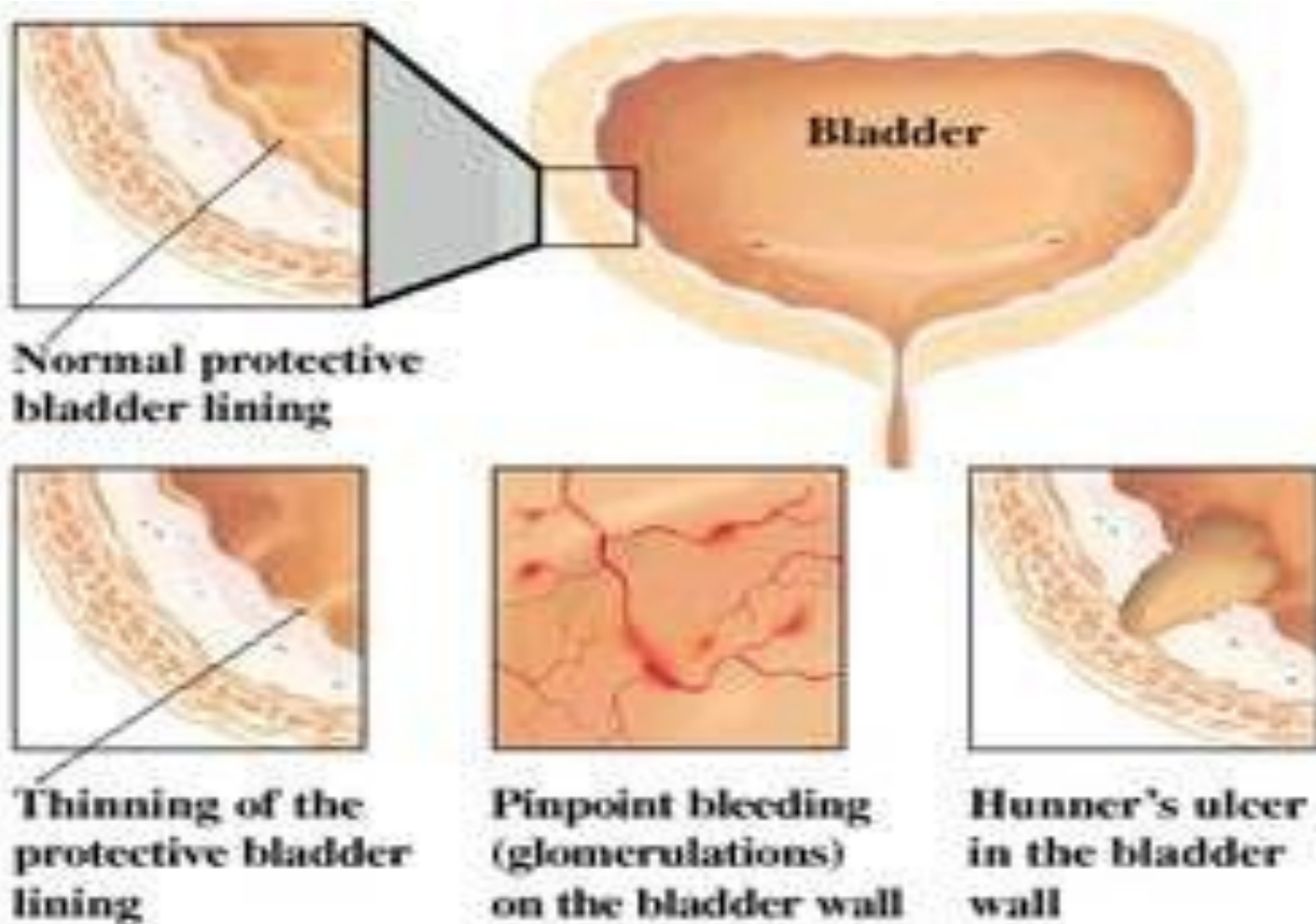
# ***Interstitial Cystitis (Chronic Pelvic Pain Syndrome)***

- ***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.***

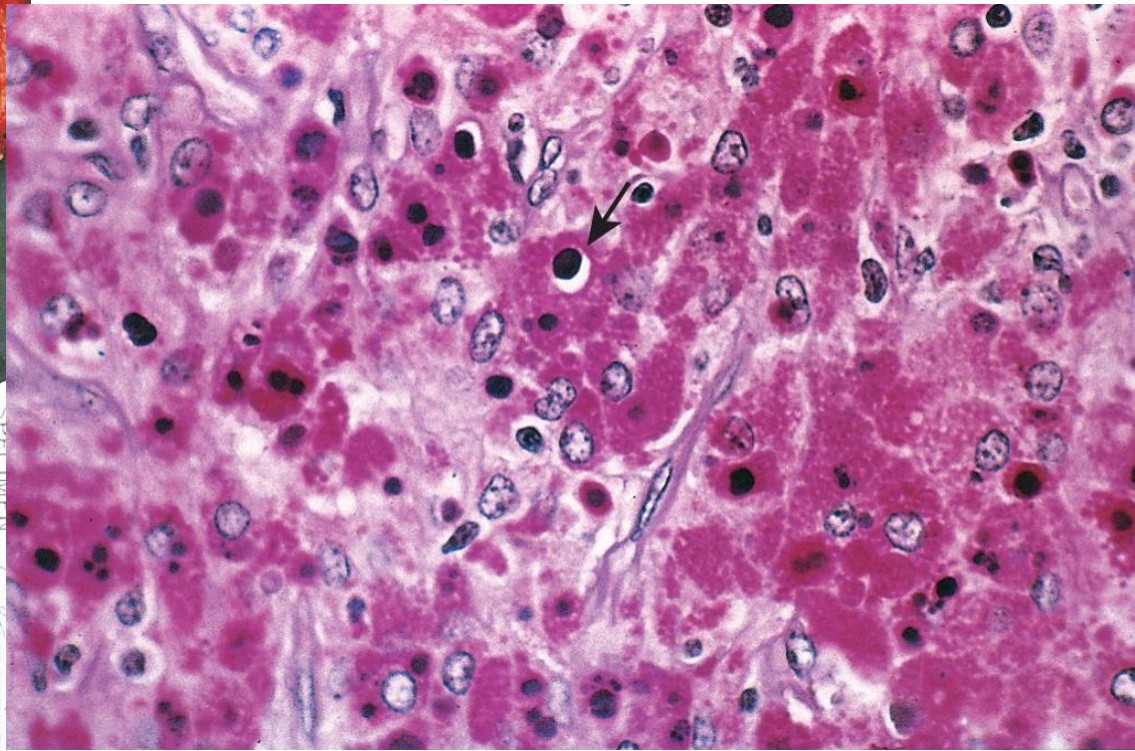
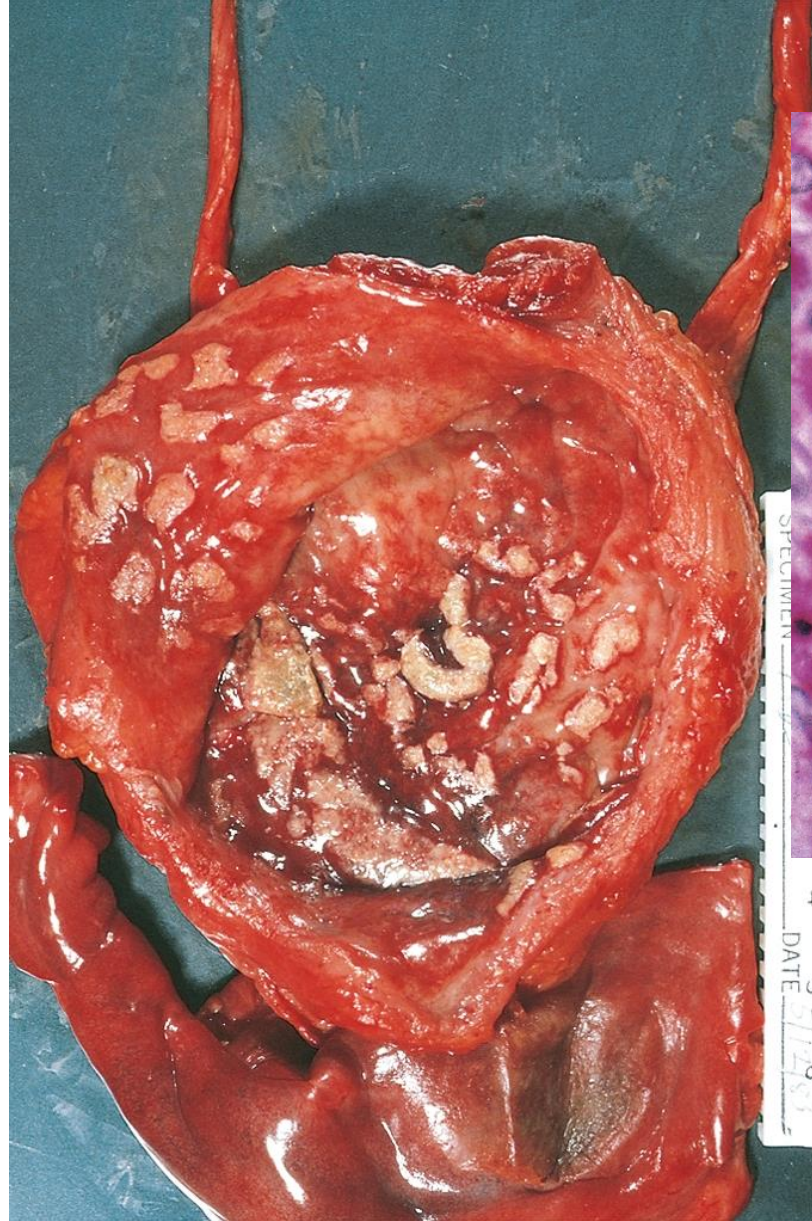
# ***Interstitial Cystitis (Chronic Pelvic Pain Syndrome)***





# ***Malacoplakia.***

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



***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.***



# ***Metaplastic Lesions of the Bladder***

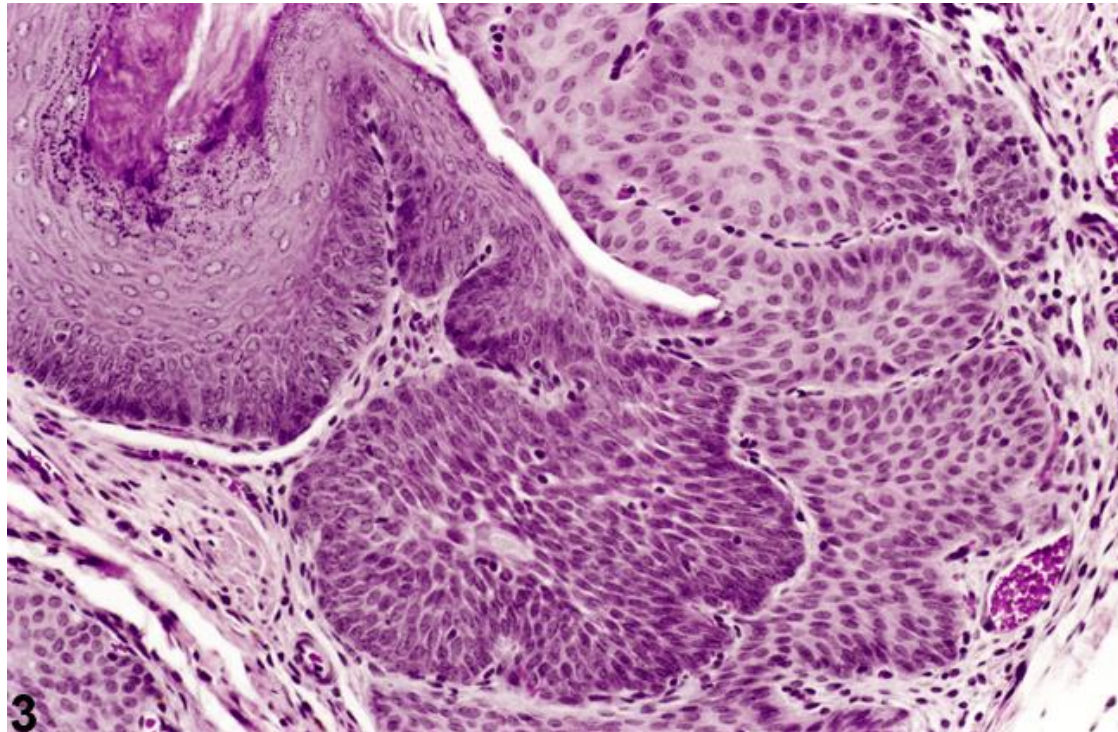
## ***Cystitis glandularis and cystitis cystica***

- ***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).***

# ***Metaplastic Lesions of the Bladder***

## ***Squamous metaplasia.***

***As a response to injury, the urothelium is often replaced by nonkeratinizing squamous epithelium, which is a more durable lining..***

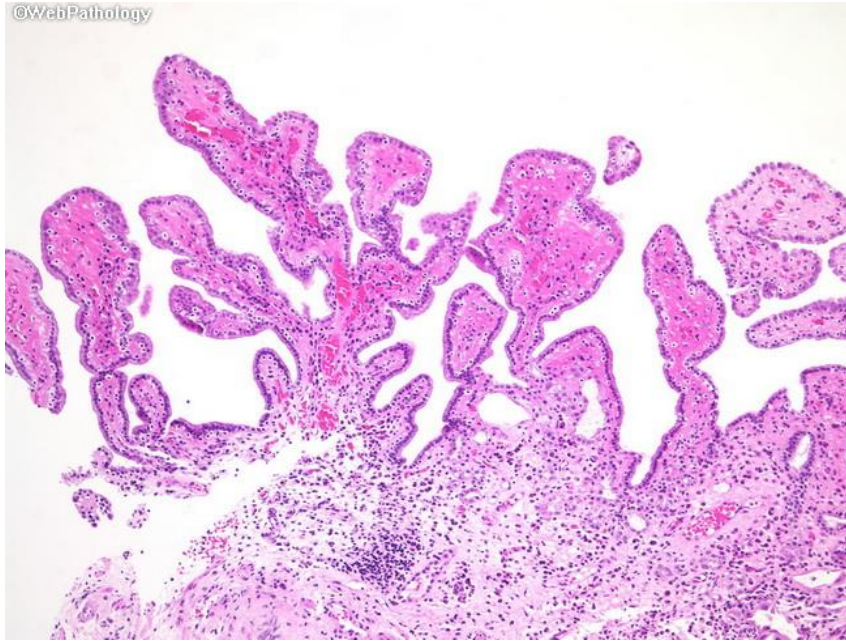


# ***Metaplastic Lesions of the Bladder***

- ***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.***
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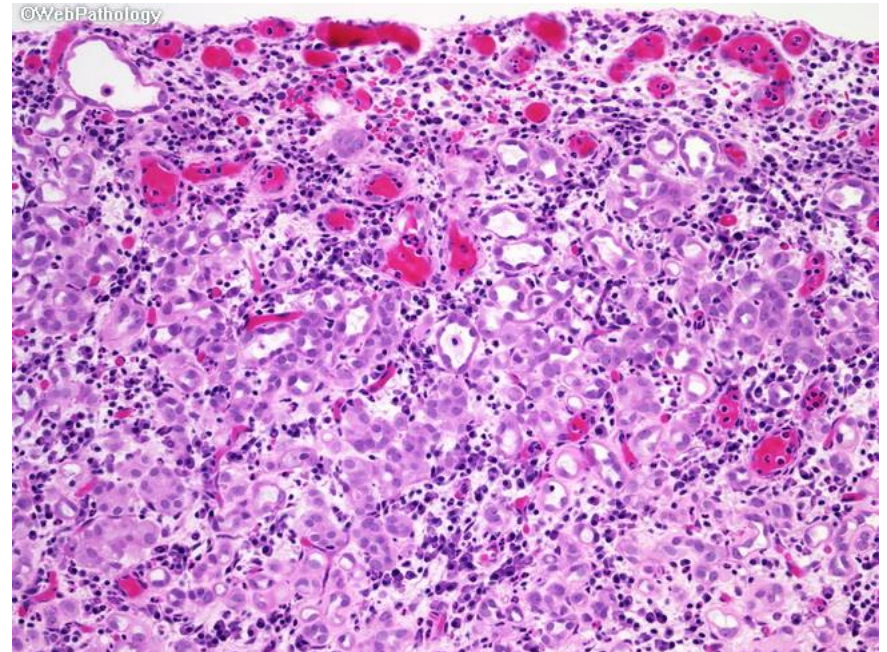


# ***Metaplastic Lesions of the Bladder***



***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



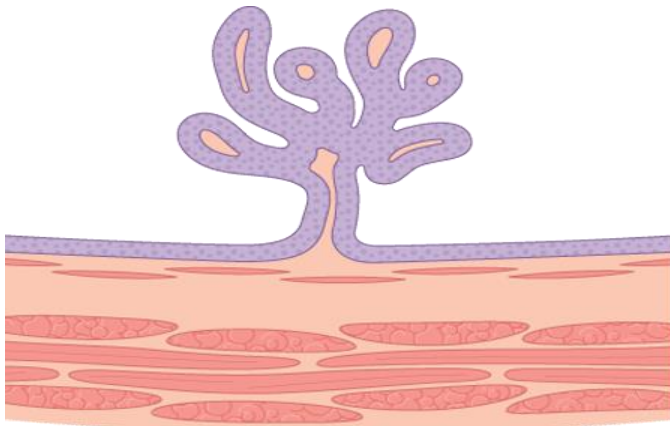
# ***Grading of Urothelial tumors (WHO/ISUP)***

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

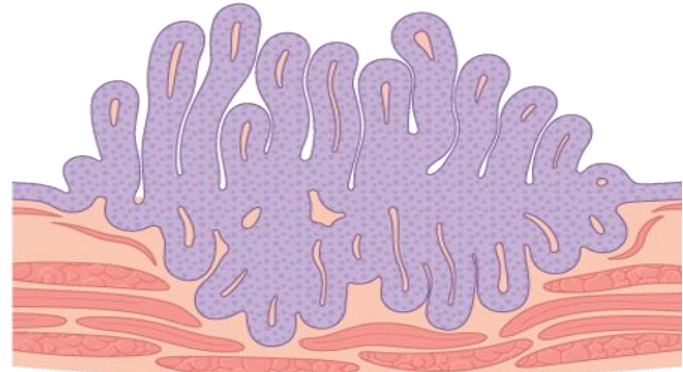
***Prognosis*** of bladder tms depend on

- ***Depth of invasion of lesion***
- ***Histologic grade***
- ***Differentiation***

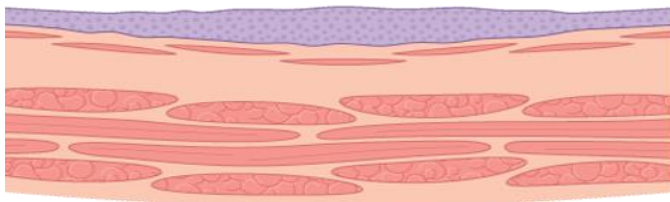
# ***Morphology***



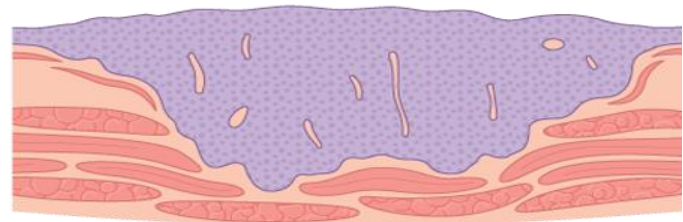
Papilloma—  
papillary carcinoma



Invasive  
papillary carcinoma



Flat noninvasive  
carcinoma (CIS)

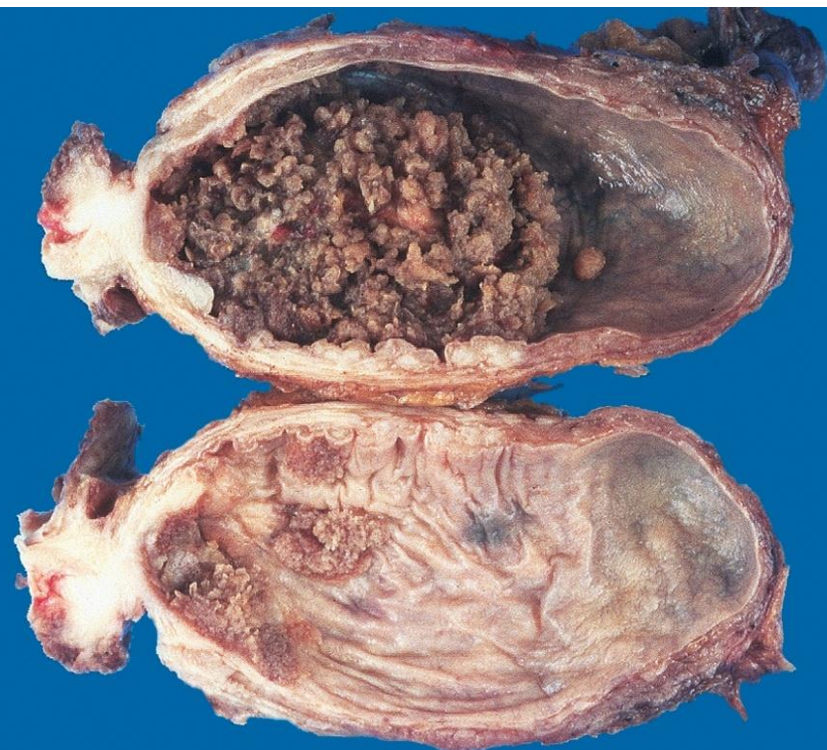


Flat invasive  
carcinoma

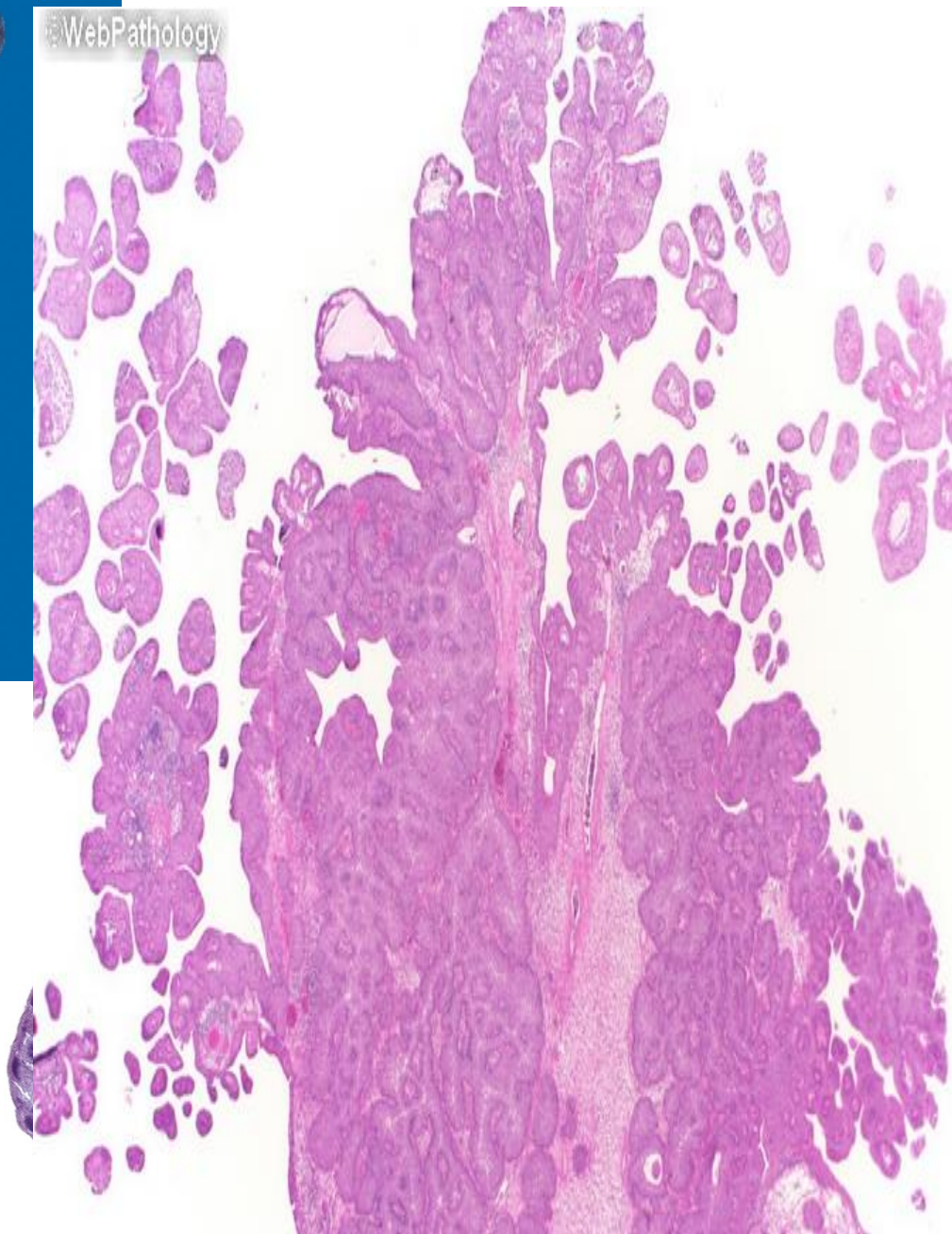
# Morphology

- *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.*





WebPathology



# ***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***



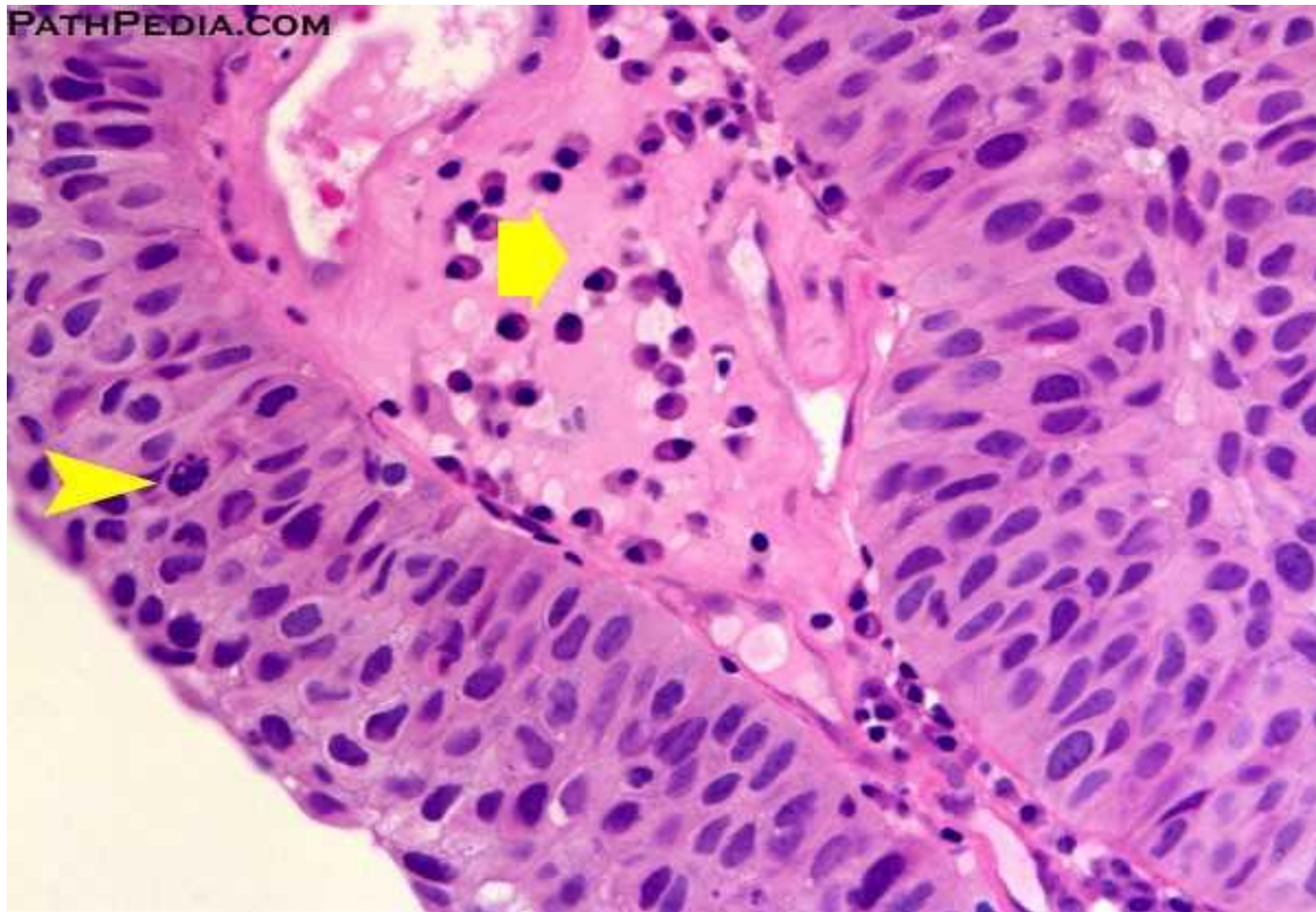
# ***Papillary Urothelial Neoplasms Of Low Malignant Potential(PUNLMPS)***



# ***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***

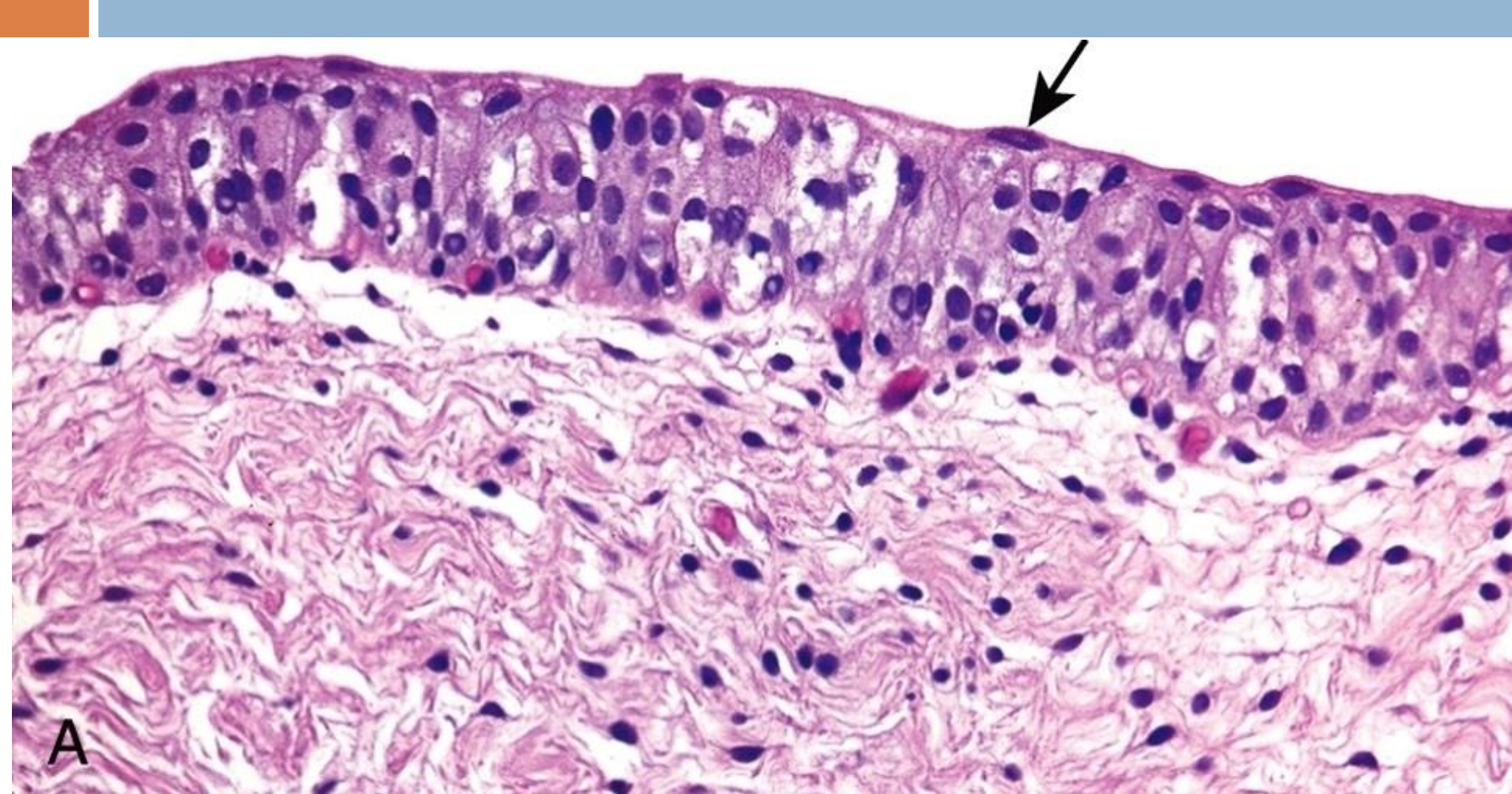




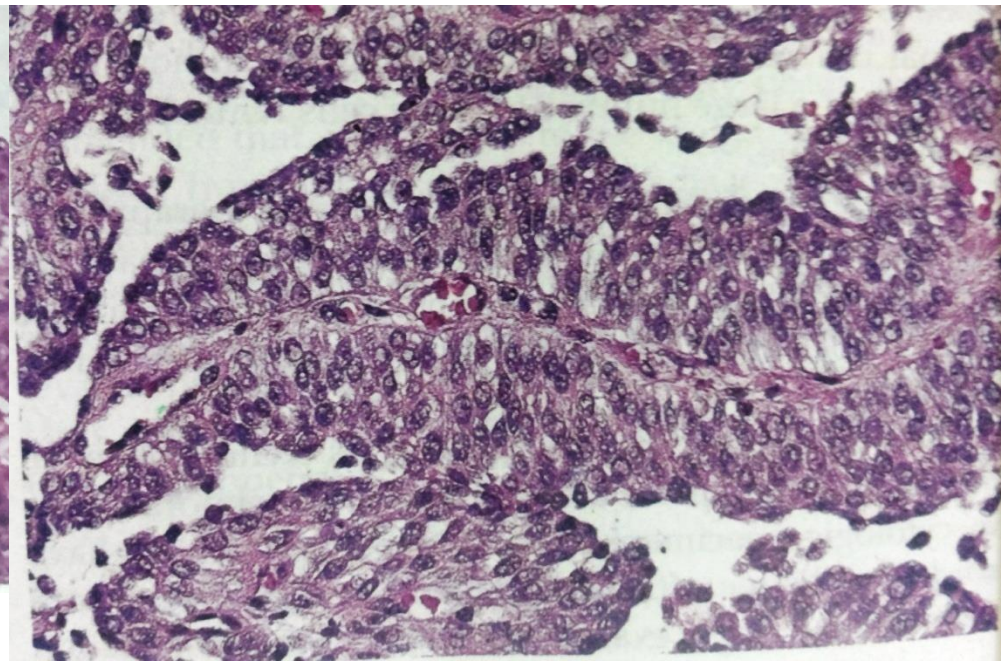
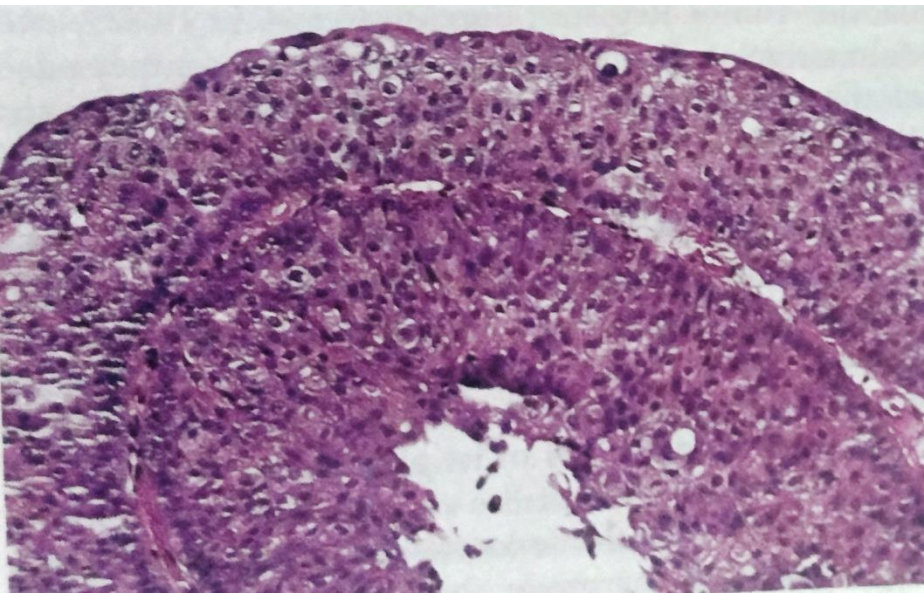
# ***High grade papillary urothelial cancers***

- ***Cells dyscohesive***
- ***Large hyperchromatic nuclei***
- ***Mitotic figures frequent.***
- ***Loss of polarity.***
- ***Higher incidence of invasion into the muscular layer.***

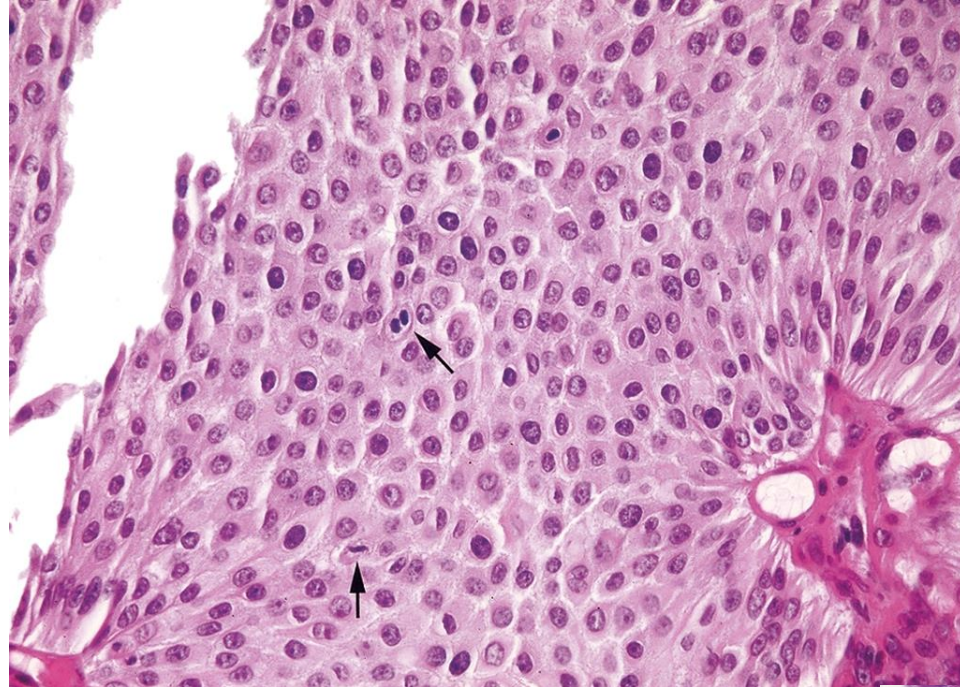
# ***Histology: Normal UB***





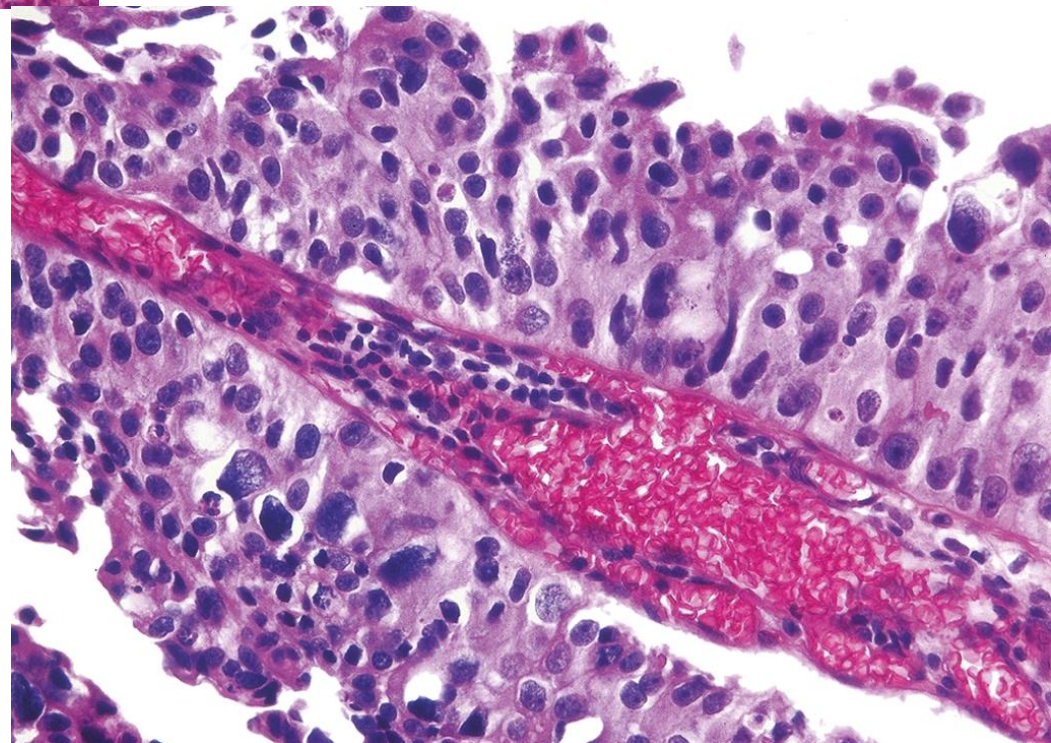






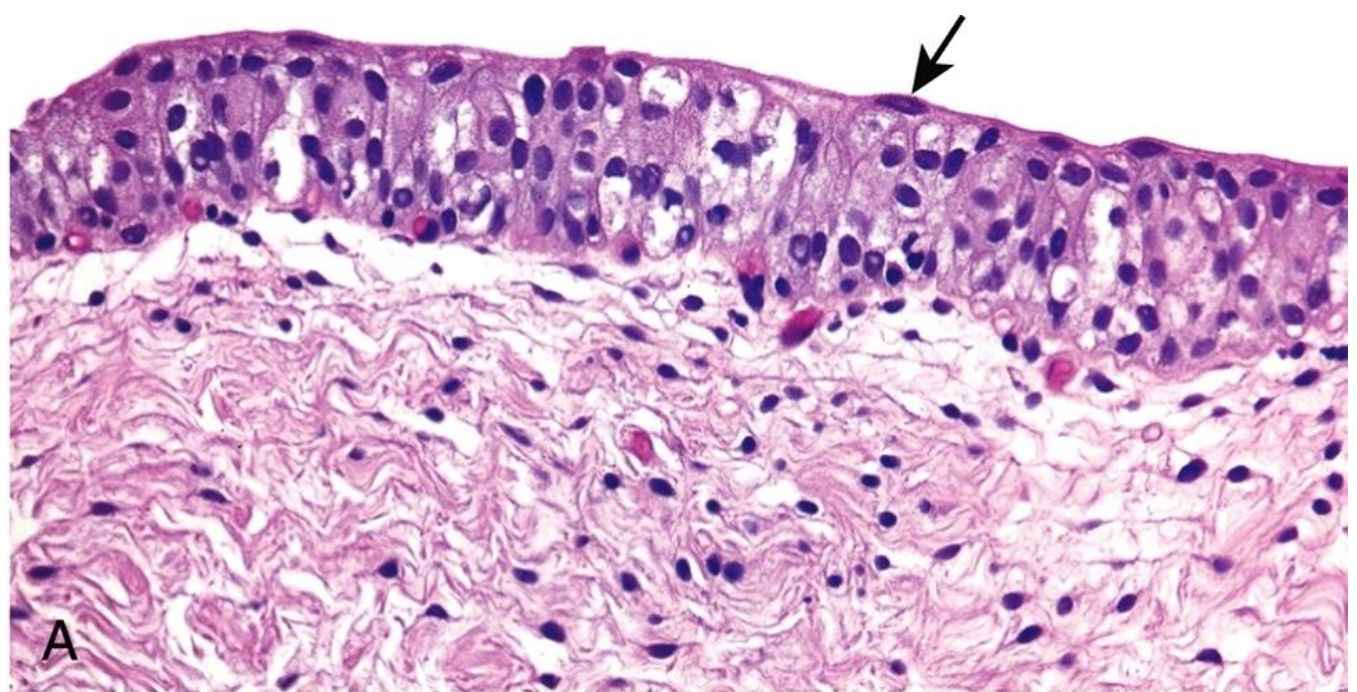
***Low grade***

***High Grade***

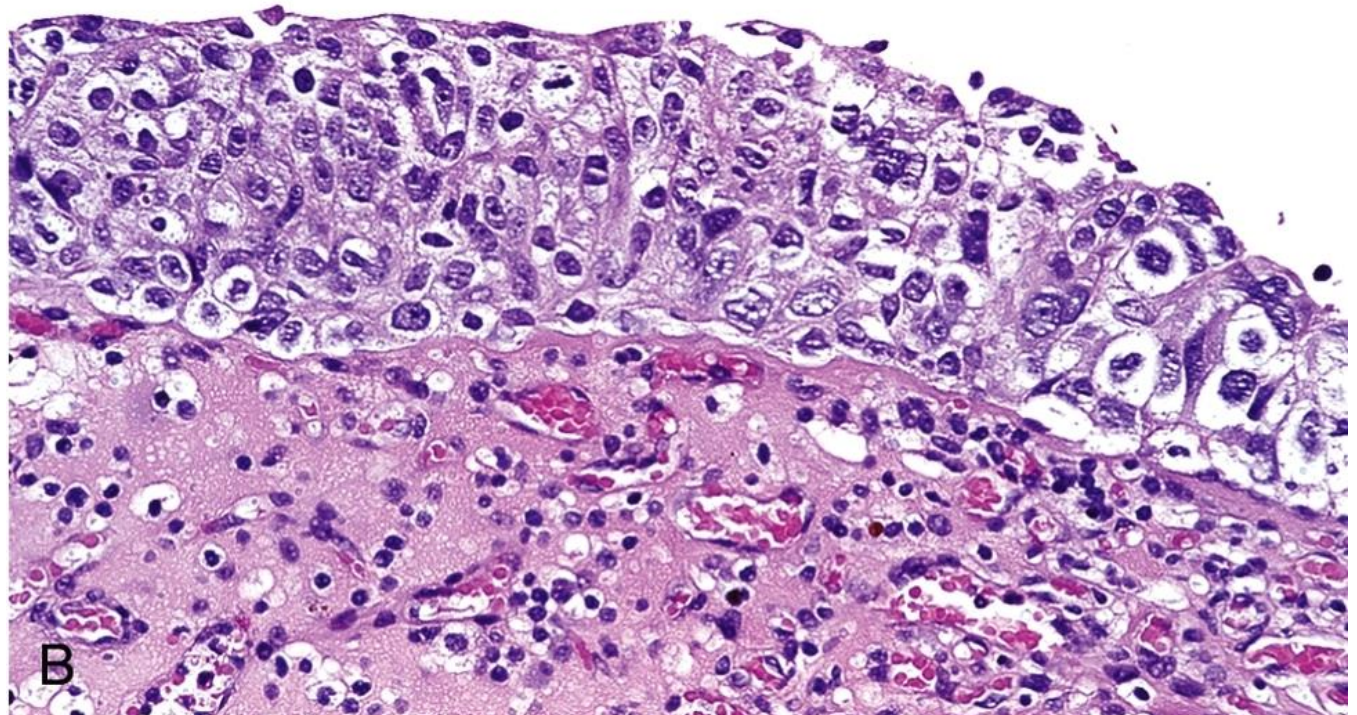




**Normal**



**CIS**



# ***Pathological Tumor Staging (AJCC/UICC)***

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

# ***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*