

THE URINARY SYSTEM **PATHOLOGY**

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Disease of the urinary bladder

Diverticulum of the urinary bladder

Definition: •

Bladder diverticulae are localized out pouching of the bladder wall. •

Congenital: •

Single •

True, formed of all layers of bladder wall •

Acquired: •

Multiple •

False, formed of mucosa only •

Occur with urethral and bladder neck obstruction •

Complication: •

Secondary infection •

Stone formation •

carcinoma •

Cystitis

Definition: inflammation of the urinary bladder •

Predisposing factors: •

Low body resistance •

Stasis of urine: •

Stricture of urethra and senile prostate •

Diverticulum of bladder •

Atony of the bladder: (bed ridden patient, paraplegia, diabetic patient). •

Presence of foreign body stone (phosphate stone, bilharzial ova). •

Truma: catheterization, cystoscopy •

Tumor •

Route of infection: •

- Ascending infection from the urethra
- Desending infection from the renal pelvis and kidney as tuberculosis (tuberculous cystitis).
- Blood borne → tonsillitis, prostatitis, lung abscess.

Pathogenic organisms: •

- E coli
- Staphylococci
- Gonococci
- Proteus, as pyelonephritis

symptoms and signs: •

- Urgency, dysuria, frequency, hematuria

Acute cystitis

Gross examination: •

Suppurative inflammation → mucous membrane hyperaemic •
and covered with pus, odema, ulceration and hemorrhage

Microscopic examination: •

Increased vascularity, odema of the lamina propria with acute •
inflammatory cell infiltrate (polymorphous, pus cells,
histiocyte cells).

Complication: •

Spread of infection → ascending •
Chronicity •
Recovery •

Chronic cystitis

Chronic nonspecific cystitis follows acute cystitis or starts •
as chronic

Gross examination: •

Small contracted bladder with thick wall due to fibrosis, •
mucous membrane granular and opaque white patches
(leukoplakia) due to keratinized squamous metaplasia.

Microscopic examination: •

- Show mild congestion and odema, chronic inflammatory cells infiltrate hyperplasia of the surface urothelium.
- Polypoid lesion → due to regeneration of urothelium and mucosal elevation
 - Brunn's nests
 - Cystitis cystica
 - Squamous metaplasia.

Other types: •

- Eosinophilic cystitis → patient has evidence of allergy, eosinophil cells predominant. •
- Gangrenous cystitis → old diabetic patient •
- Follicular cystitis → formation of lymphoid follicles in lamina propria •
- Polypoid cystitis → polypoid mucosal projections due to indwelling catheters •

Malakoblakia

Unknown cause predominant of histocyte cells (Von •
Hansemann cells) containing cytoplasmic inclusions
(Michaelis Gutmann bodies)

(Multiple yellow plaques with central umbilication). •

Interstitial cystitis (Hunner's ulcer) •

Unknown etiology •

Middle age woman •

Negative urine cultures •

Chronic specific cystitis: •

Bilharzial •

Tubercuosis •

Fungal •

Amoebic •

Complication: •

Spread of infection •

Contracted bladder •

Stones •

Carcinoma •

Tumors of the urinary bladder

Benign tumors: •

Inverted papilloma •

Fibroma •

Neurofibroma •

Angioma •

Leiomyoma •

Extra adrenal pheochromocytoma •

Granular cell tumor •

Malignant tumors •

Transitional cell carcinoma •

Squamous cell carcinoma •

Adenocarcinoma •

Carcinosarcoma •

Leiomyosarcoma •

Rhabdomyosarcoma → embryonal (botryoid sarcoma) •

occurs mainly in children

Lymphoma •

secondary •

Carcinoma of urinary bladder

Transitional cell carcinoma: •

Arise from the transitional epithelial lining •

Chemical carcinogen are of aeiological importance: •

Aniline dye •

Rubber industry •

Paint •

Benzidine and related compounds •

Cigarette smokers •

Chronic cystitis •

Age: above 50 years •

Site → in the lateral and posterior walls of the bladder •

Gross picture: •

Papillary pattern •

Fungating mass •

Ulcerative pattern •

Infiltrating pattern •

The above pattern occur in transitional, squamous, or •
adenocarcinoma

Urothelial carcinoma



This bladder was removed surgically from a male who had a long history of smoking. He had presented with hematuria. The opened bladder reveals masses of a neoplasm that histologically proved to be urothelial carcinoma (previously known as a transitional cell carcinoma). Urothelial carcinoma can arise anywhere in the urothelium lining the urinary tract from the urethra to the calyces, but is most common in bladder. Urothelial carcinoma is often .multifocal and has a tendency to recur



Urinary bladder carcinoma

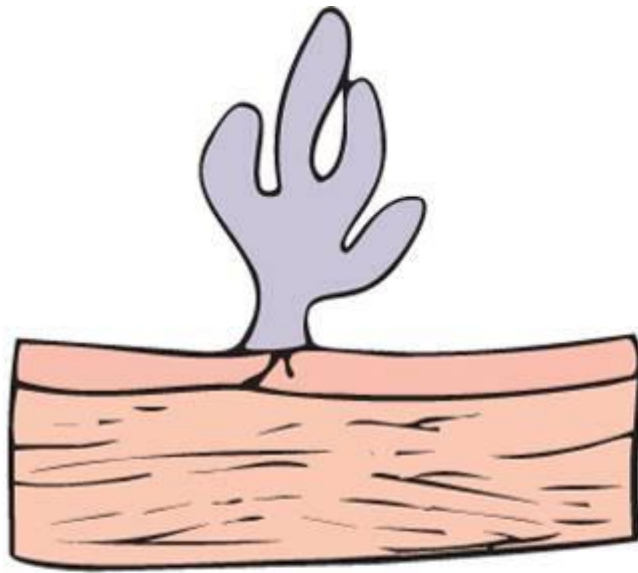


In the bladder removed surgically and opened here can be seen a large urothelial carcinoma. These neoplasms arise from the urothelium. A presenting sign can often be hematuria. Cytologic examination of urine can reveal malignant cells shed from the surface of the neoplasm. Cystoscopy can be performed and biopsies taken.



Microscopic examination: •

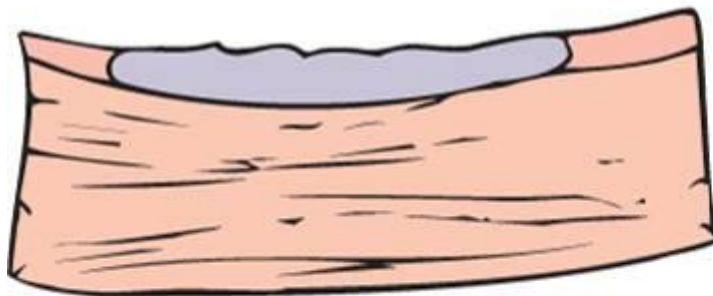
- Papillary projection into the lumen with central fibro vacular core and covered by transitional epithelial cells.
- Grade I: the layers of covering cells from 3 – 4 transitional epithelial cells, mitosis rare
- Grade II: 5 -10 cells, mitosis ↑ & ↑ nuclear pleomorphism
- Grade III: papillary and solid masses, mitosis ↑ , marked pleomorphism
- Grade IV: solid masses, ↑ mitosis, ↑ pleomorphism, anaplastic cells.



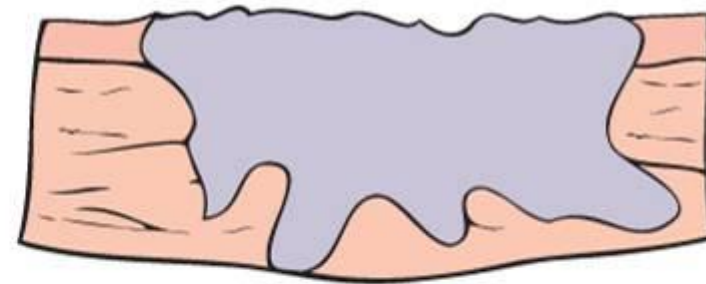
Papilloma-
papillary carcinoma



Invasive
papillary carcinoma

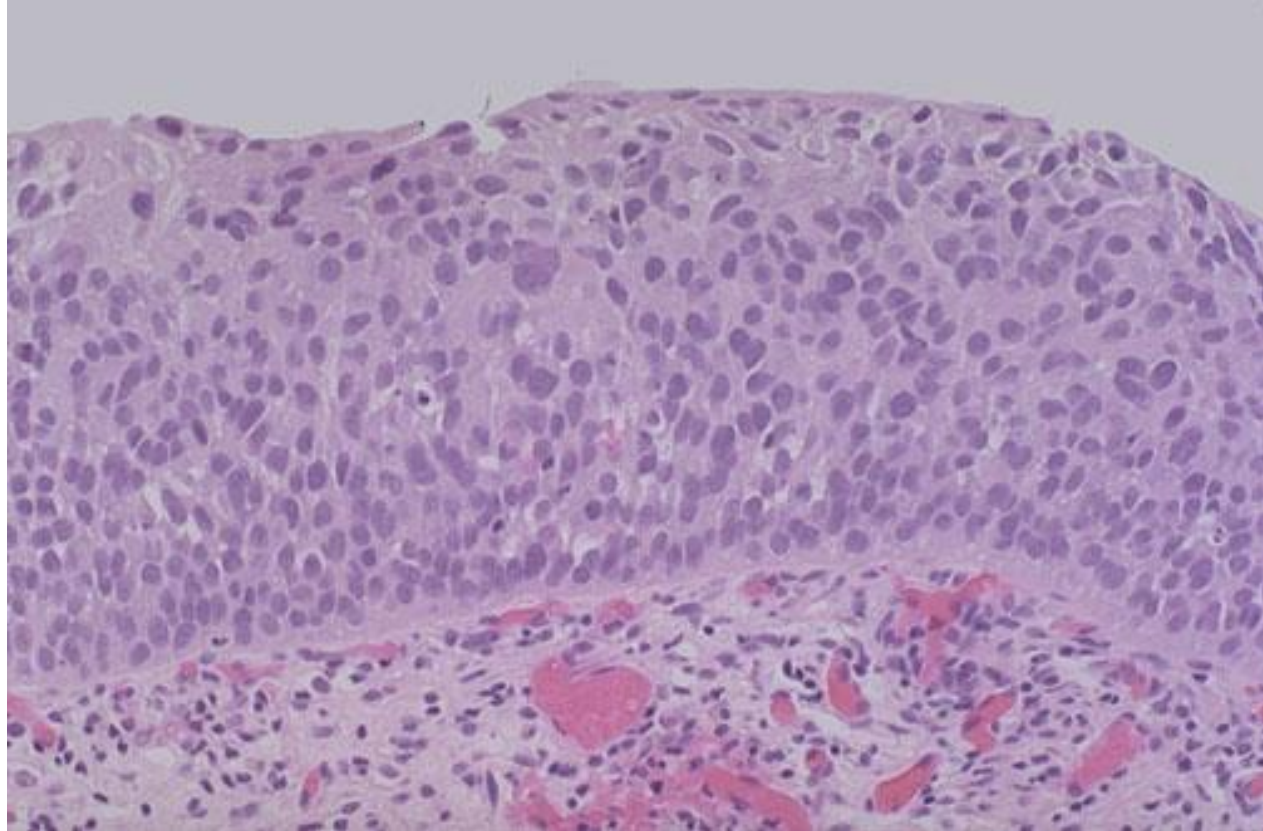


Flat noninvasive
carcinoma

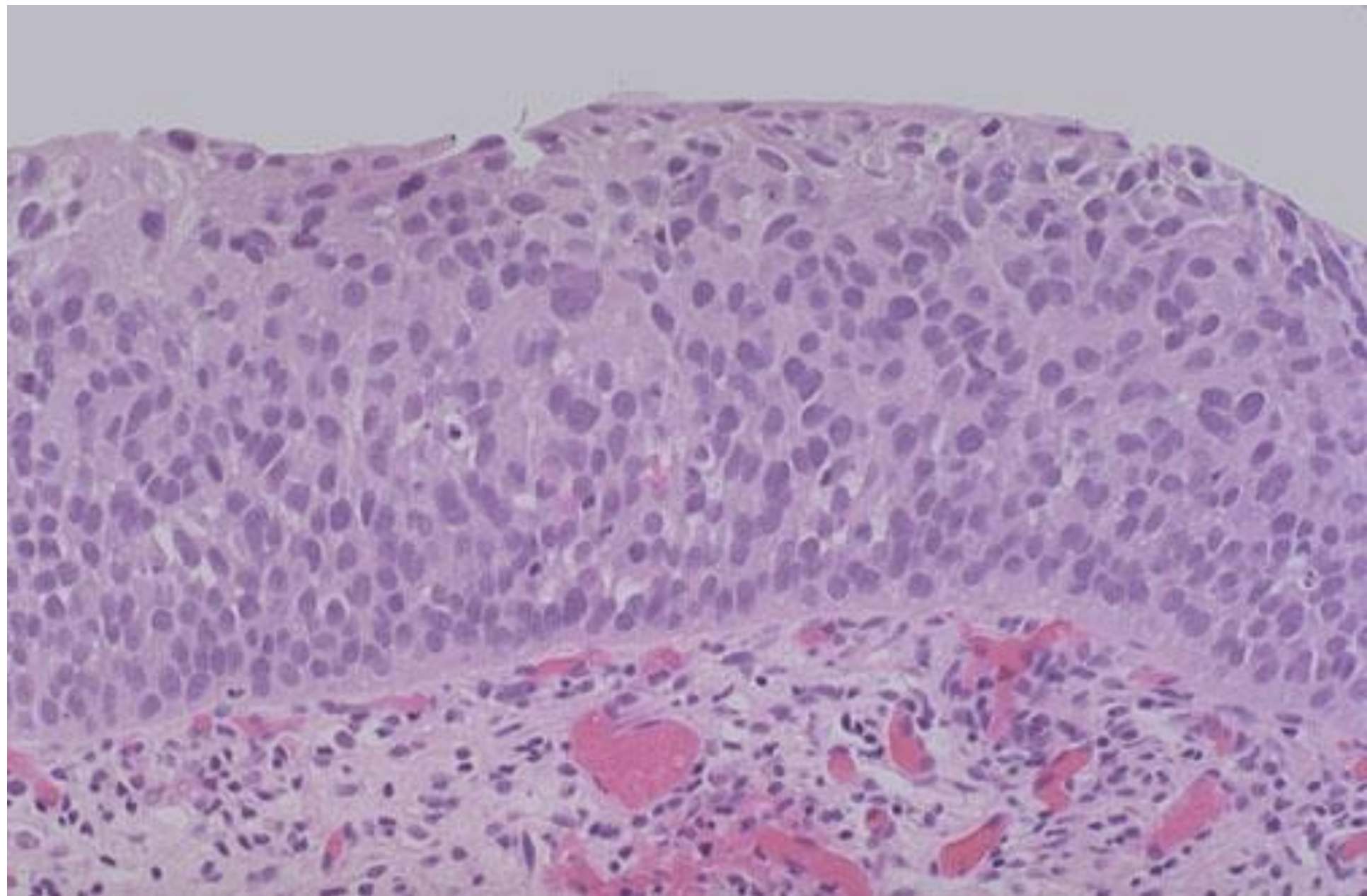


Flat invasive
carcinoma

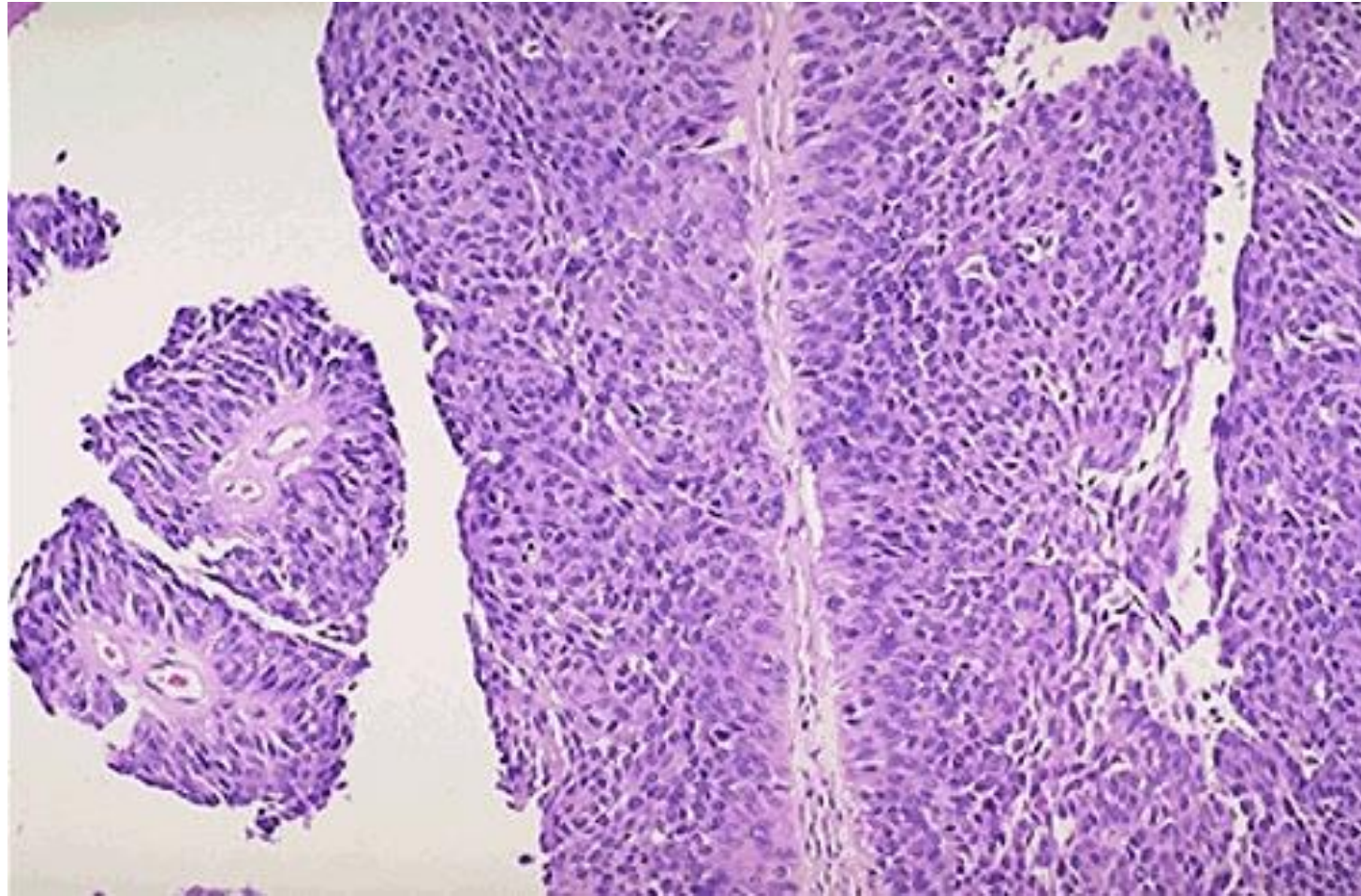
Urothelial carcinoma in situ



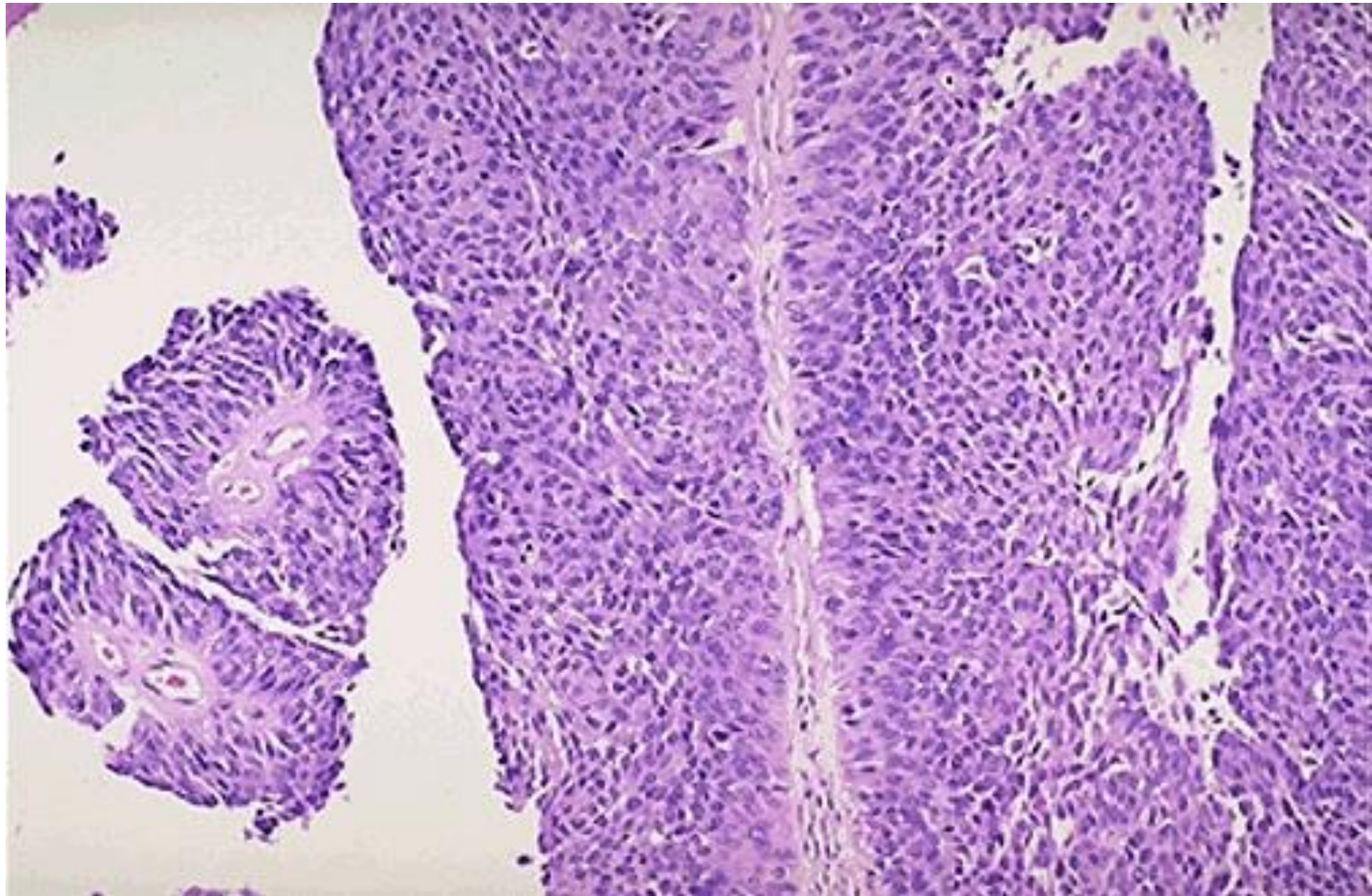
The causative factors for urothelial carcinoma typically act upon the entire extent of the transitional epithelium in the urinary tract, and it is common for areas of neoplasia to arise multifocally. Seen here is urothelial carcinoma in situ. The abnormal cells are confined to the epithelium above the basement membrane. This area was present in a random bladder biopsy in a patient who also had a grossly visible lesion on cystoscopy.

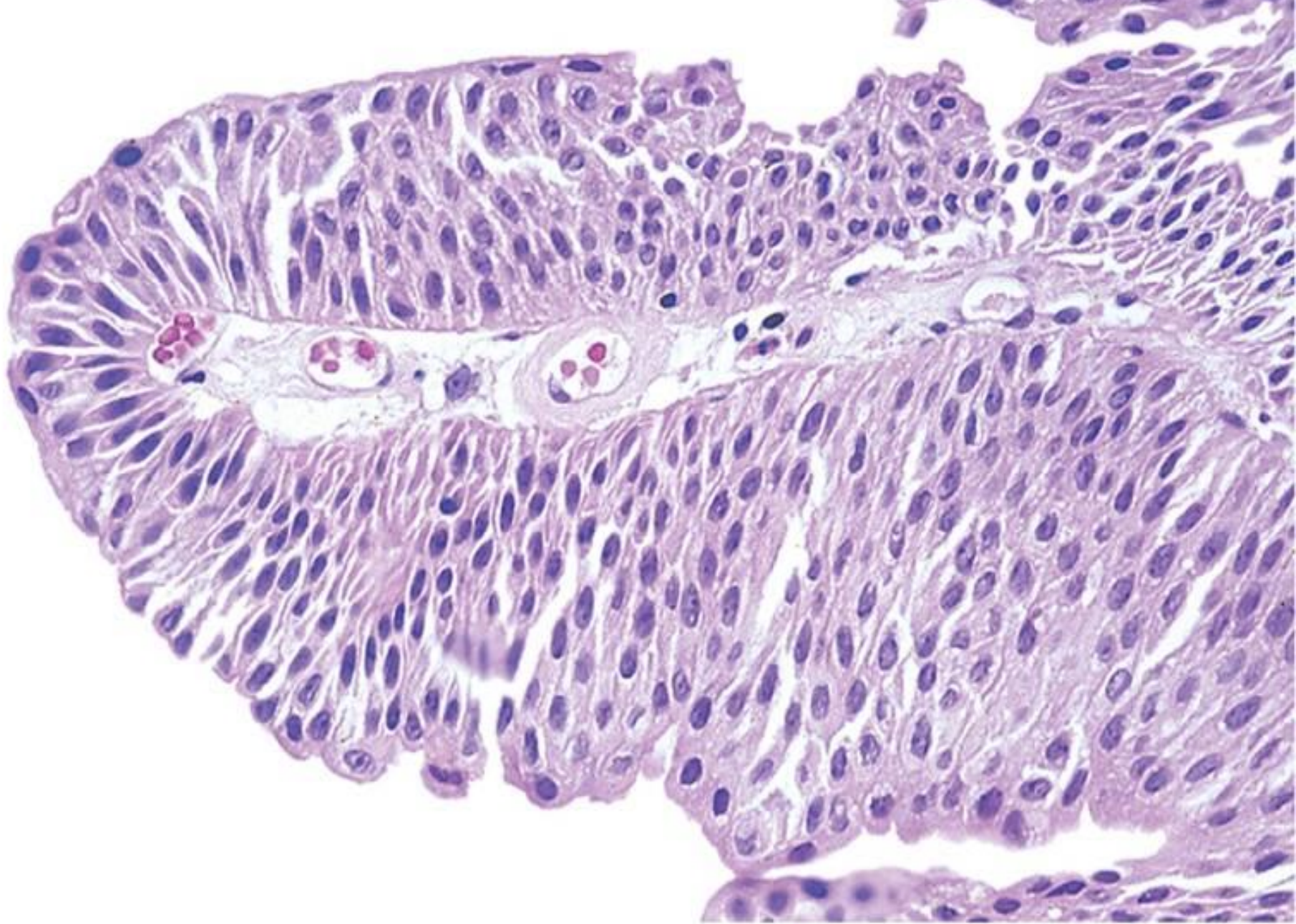


Urothelial carcinoma



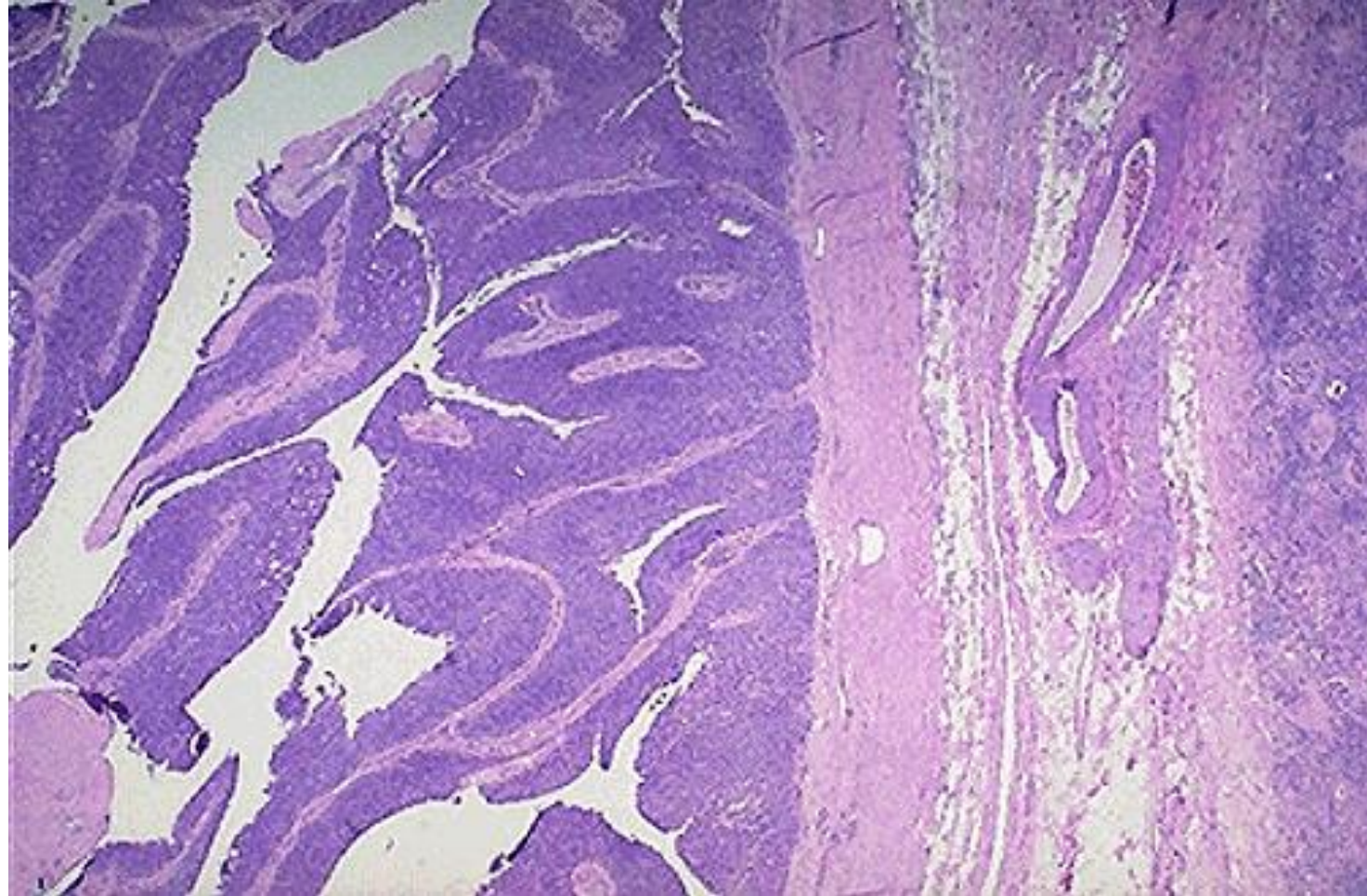
At medium power, the urothelial carcinoma does resemble urothelium, but the thickness is much greater than normal urothelium, and the neoplastic cells show more pleomorphism.



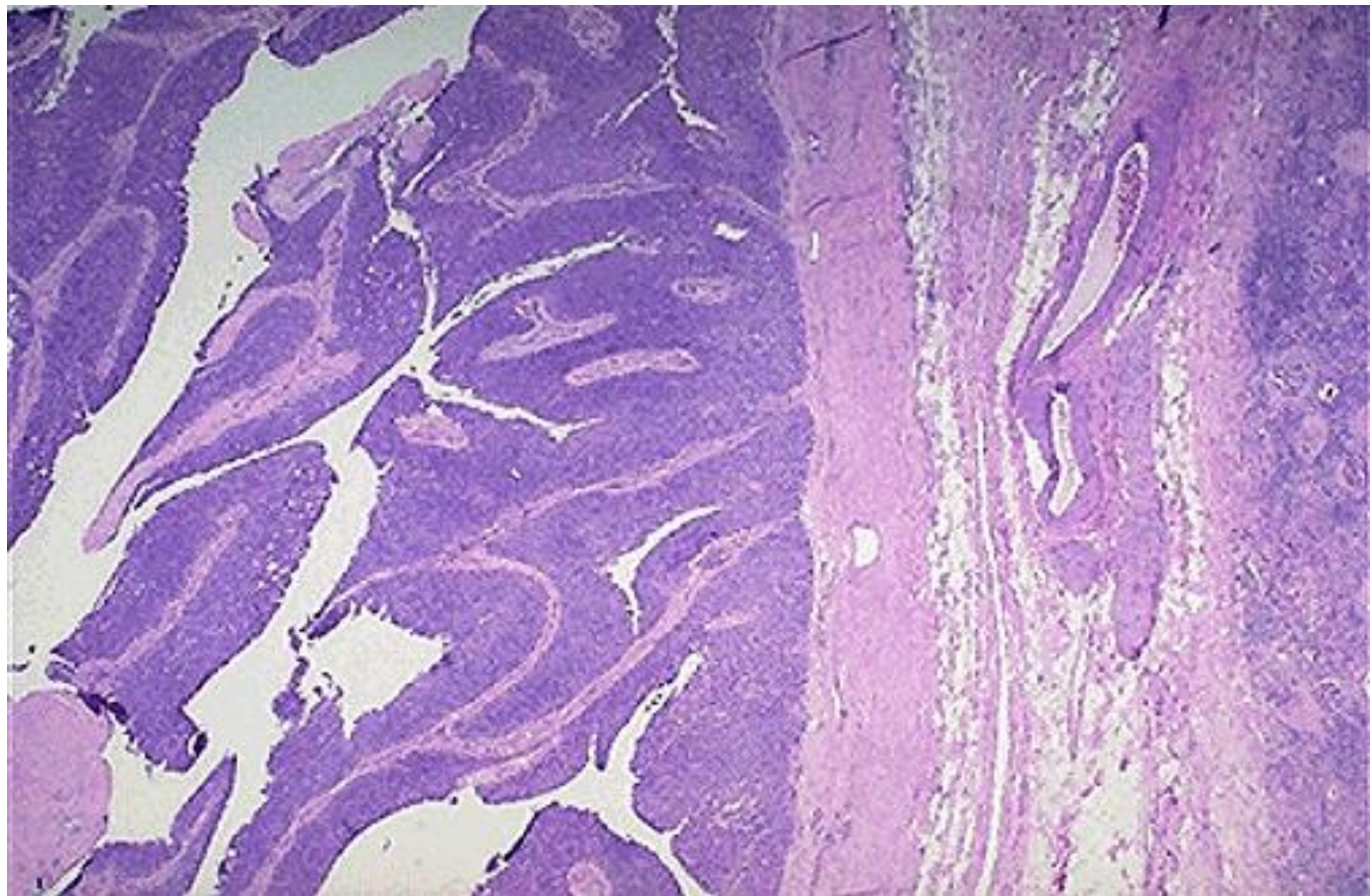


Bladder carcinoma

Urothelial carcinoma



A urothelial carcinoma of the urothelium is shown here at low power to reveal the frond-like papillary projections to the left of the tumor above the surface. It is differentiated enough to resemble urothelium, but it is producing a mass effect. No invasion to the right is seen at this point.



T.N.M Staging of Bladder cancer: •

Tis: carcinoma in situ .1

Ta: non-invasive papillary cancer .2

T1: invasion of lamina propria .3

T2: invasion till superficial musculosa .4

T3a: invasion till deep masculosa .5

T3b: invasion through bladder wall .6

N0,N1,N2,N3,N4: according to the degree lymph node .7
involvement

M0,M1: absent or present of metastasis .8

Spread: •

Direct to prostate, seminal vesicles, ureters, rectum and
vagina •

Lymphatic spread to iliac, para-aortic lymph nodes •

Blood to lungs, liver, bones, brain. •

Complication: •

Hydro ureter, hydronephrosis, renal failure •

Cystitis, pyelonephritis, pyoureter, pyonephrosis •

Hematuria •

Malignant fistula •

Squamous cell carcinoma: •

Stone → squamous metaplasia •

Bilharzial effect → squamous metaplasia •

Adeno carcinoma: •

Common in cases of (Ectopia vesica) congenital •
absence of anterior bladder and anterior abdominal
walls.

Causes of enlarged kidney: •

- Polycystic kidney
- Hydronephrosis
- Renal tumors
- Pyonephrosis
- Chronic venous congestion
- Acute post-streptococcal glomerulonephritis
- Rapidly progressive glomerulonephritis
- Early amyloidosis

Nephrotic syndrome → primary causes •

Fatty change kidney •

Tuberculosis •

Bilharziasis •

Acute pyelonephritis •

Diabetes mellitus •

Leukemias •

Lymphomas •

Causes of small kidney: •

- Hypoplasia
- Late stages of amyloidosis
- Chronic diffuse glomerulonephritis
- Chronic pyelonephritis
- Benign nephrosclerosis
- Atherosclerotic kidney
- Healed infarction
- Radiation nephritis

Hematuria:

Definition: hematuria means passage of blood in urine •

Local cause: •

Nephritic syndrome.1

Polycystic kidney .2

Renal tumors.3

Chronic venous congestion.4

Infarction.5

Stones.6

Inflammations: ureteritis, cystitis, urethritis.7

Trauma → kidney.8

Bilharziasis urinary bladder.9

Catheterization .10

General causes: •

Vitamin C & K deficiency •

Hypertension •

Leukemia •

Anti coagulant therapy •