GMT109: Practical Class- Lower Urinary Tract and Male Genital Tract Pathology

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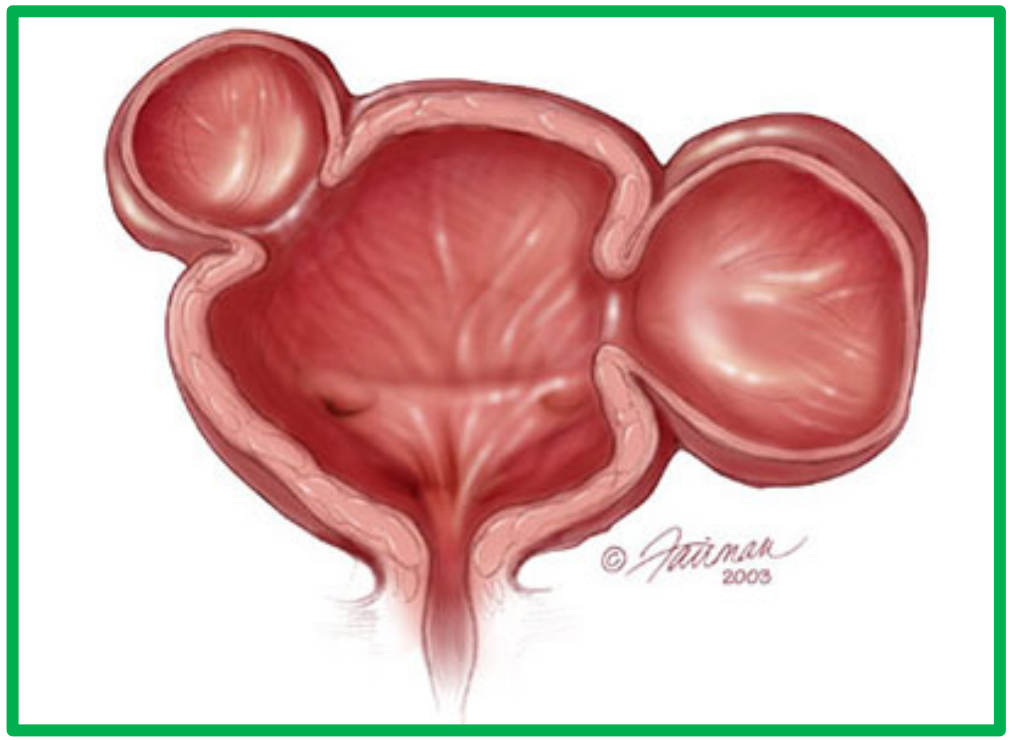
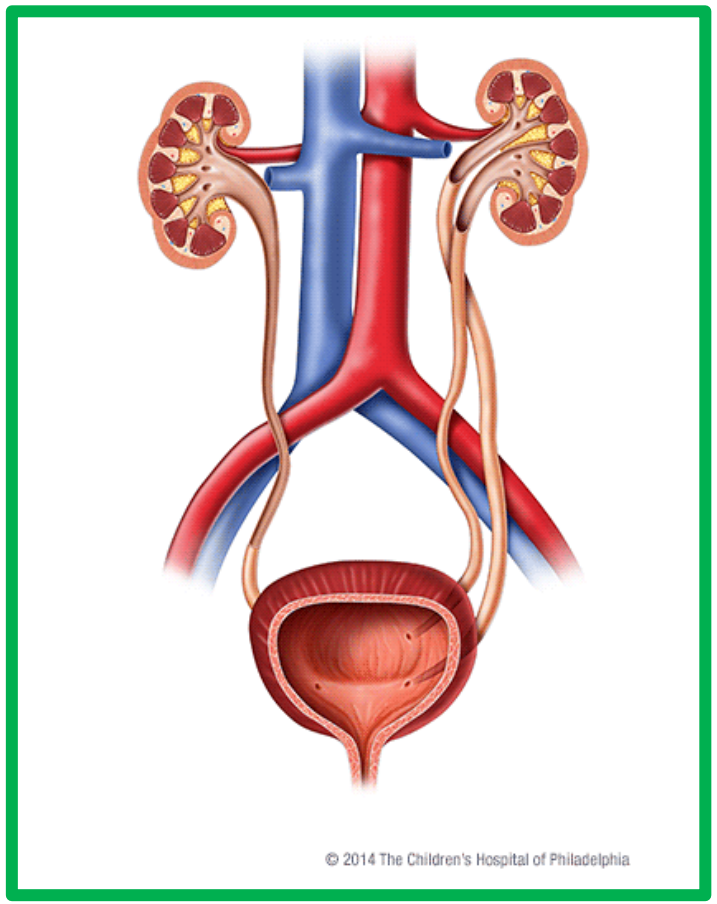
Name the pathology of the picture show below:

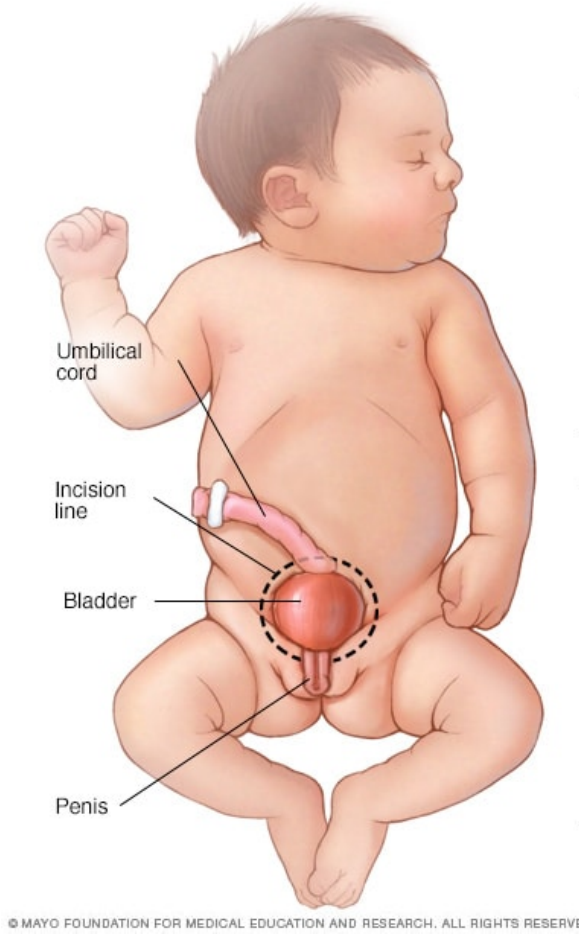


Diverticular of urinary bladder



Bifid ureters

Name the pathology of the picture show below:



Bladder exstrophy

Hypospadias

List the causes of ureter obstruction and its complication

Intrinsic	
Calculi	Typically of renal origin Usually small (5 mm in diameter or less) Impact at loci of ureteral narrowing—ureteropelvic junction, where ureters cross iliac vessels and where they enter bladder—and cause excruciating "renal colic"
Strictures	May be congenital or acquired
Tumors	Urothelial carcinomas arising in ureters Rarely, benign tumors or fibroepithelial polyps
Blood clots	Massive hematuria from renal calculi, tumors, or papillary necrosis
Neurogenic	Interruption of the neural pathways to the bladder

Extrinsic	
Pregnancy	Physiologic relaxation of smooth muscle or pressure on ureters at pelvic brim from enlarging fundus
Periureteral inflammation	Salpingitis, diverticulitis, peritonitis, sclerosing retroperitoneal fibrosis
Endometriosis	With pelvic lesions associated with scarring
Tumors	Cancers of the rectum, bladder, prostate, ovaries, uterus, cervix; lymphomas, sarcomas

Complication: hydroureter, hydronephrosis, and pyelonephritis

What is Vesicoureteral reflux?
What are the causes and its complication

Congenital absence or shortening of the intra-vesical portion of the ureter/incompetence of the vesicoureteral valve → reflux

Causes:

- Congenital
- It may be **acquired** by bladder infection itself.

Complication:

- Ascending pyelonephritis
- Loss of renal function

List the causes of acute and chronic cystitis

- **Bacterial pyelonephritis**
  - *Escherichia coli,* followed by *Proteus, Klebsiella,* and *Enterobacter.*
  - *Tuberculous cystitis*
  - *Clostridium perfringens*

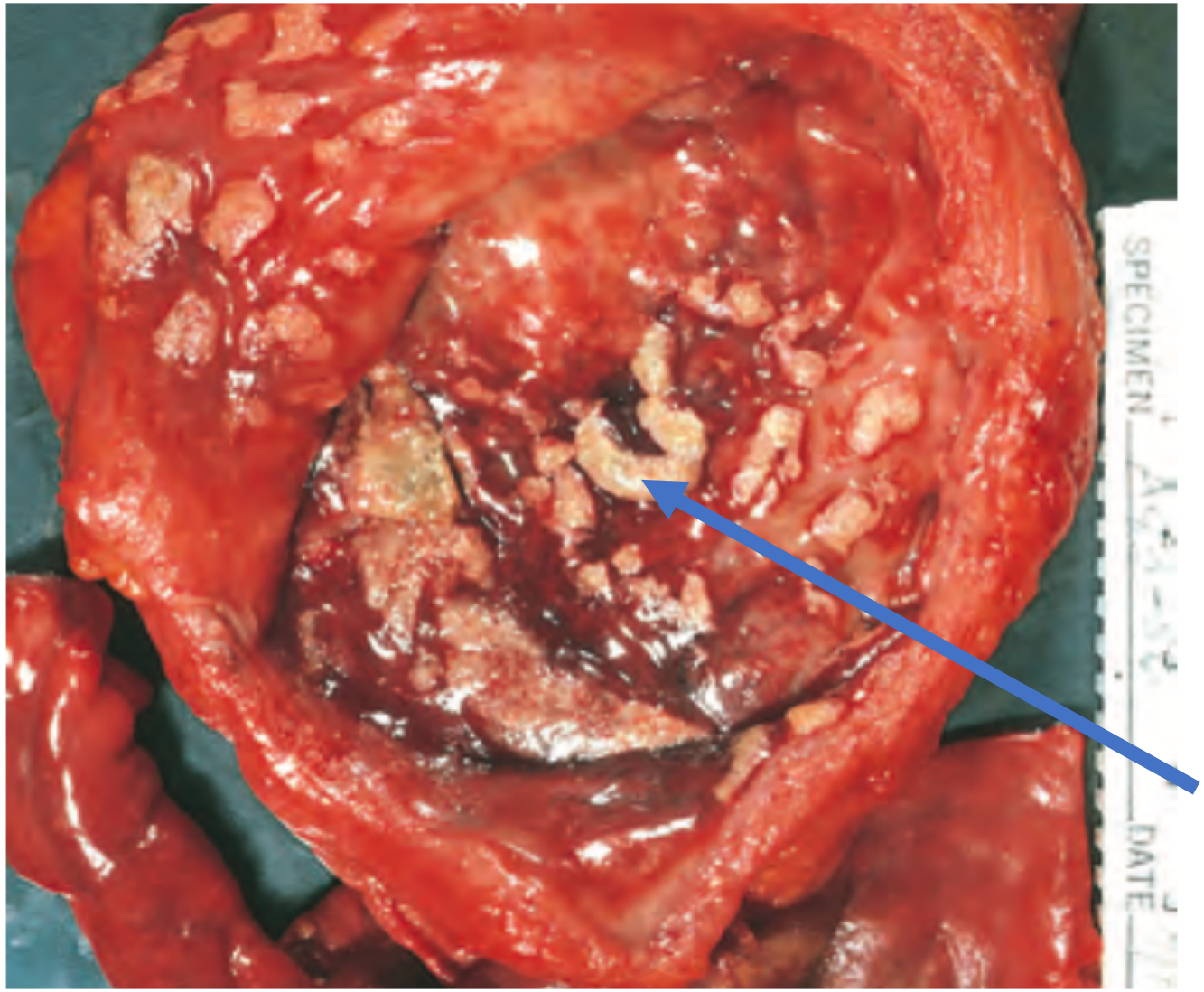
- **Fungal & parasites**
  - *Candida albicans*, cryptococcal agents
  - Schistosomiasis *(Schistosoma haematobium)*

- **Virus**
  - Adenovirus and BK virus infections

What are the clinical features if cystitis?

Clinical features:

- All forms of cystitis are characterized by a triad of symptoms:
  - **Frequency**-acute cases may necessitate urination every 15 to 20 minutes
  - **Lower abdominal pain** localized over the bladder region or in the suprapubic region
  - **Dysuria** (pain or burning on urination).

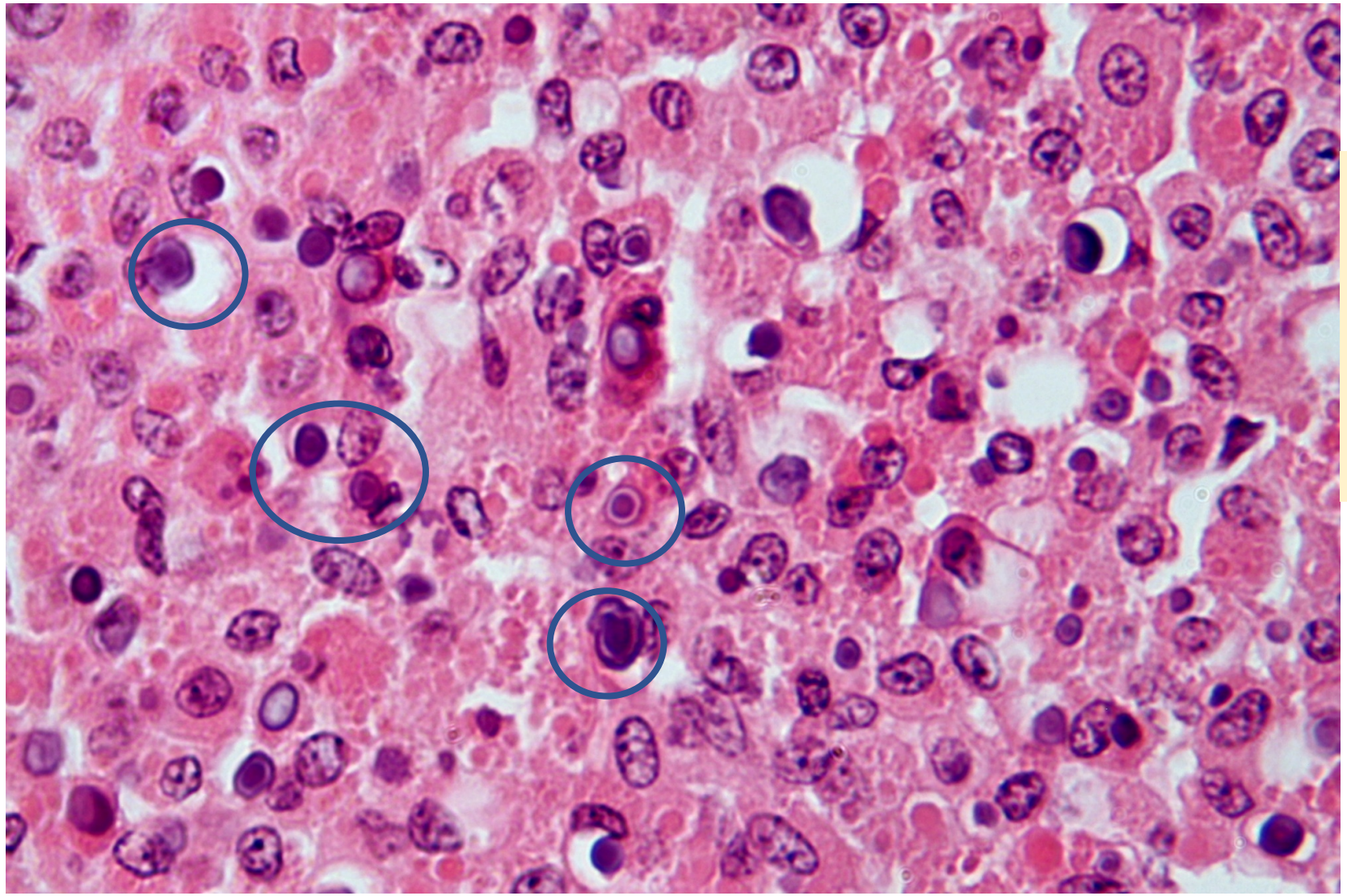


Question 1

50-year-old, male, presented with hematuria.

1. Describe the gross morphological features of photomacrograph A1**:**

Gross: soft yellow, slightly raised mucosal plaques



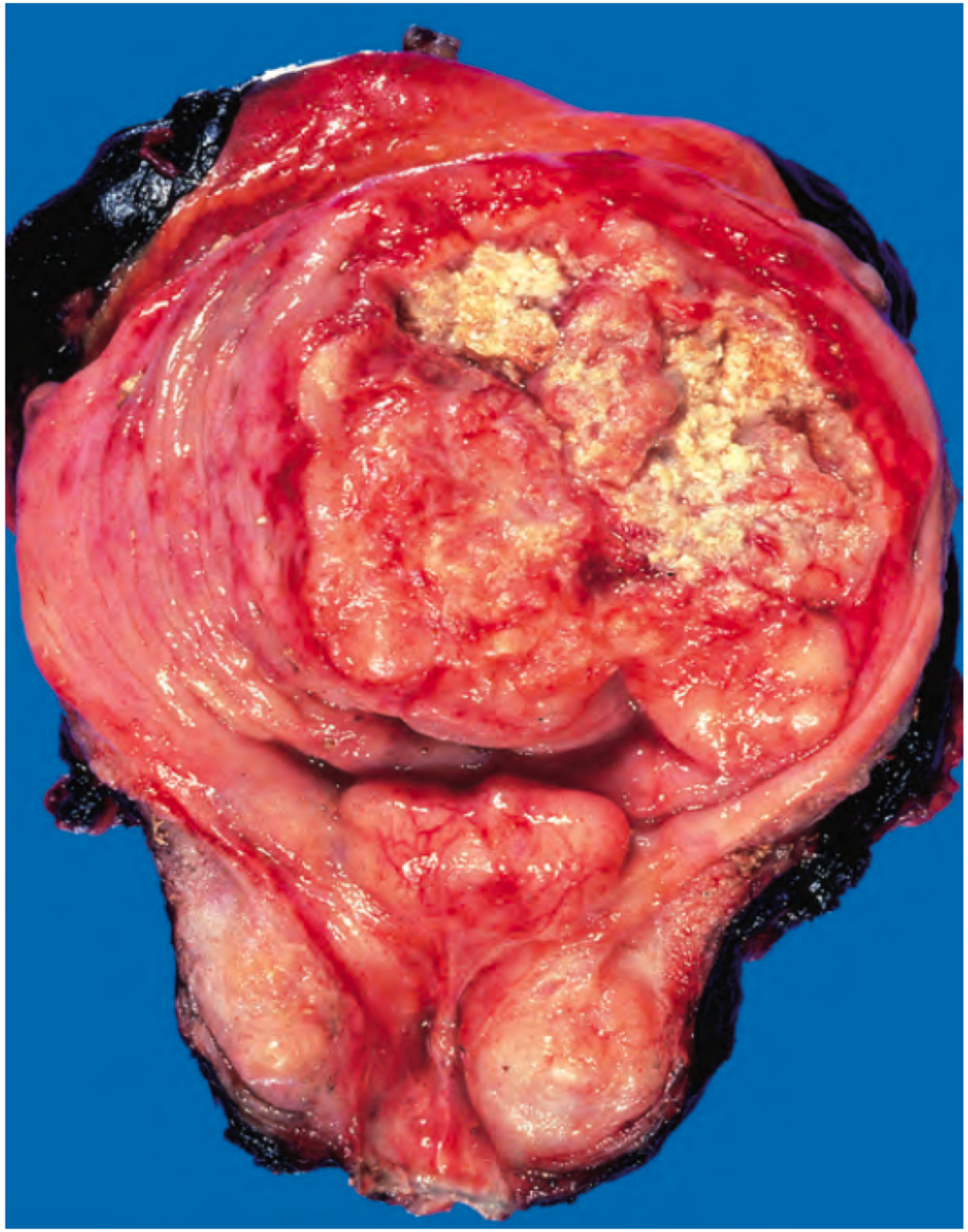
photomicrograph A2

2. Describe the histopathological findings in photomicrograph

Microscopic: aggregates of large foamy macrophages. The macrophages contain abundant granular cytoplasm with particulate and membranous debris of bacterial origin. Scattered Michaelis-Gutmann bodies (blue circle)

3. State your diagnosis

Malakoplakia



photomacrograph A1

Question 2

60-year-old, male, presented with painless hematuria. Describe the gross morphological features of photomacrograph A1.

- **Rule 1**: Identify the organ. Find the organ written in scenario if any. **Here it is BLADDER**

- **Rule 2**: Identify the tumour and location: **MUCOSA**

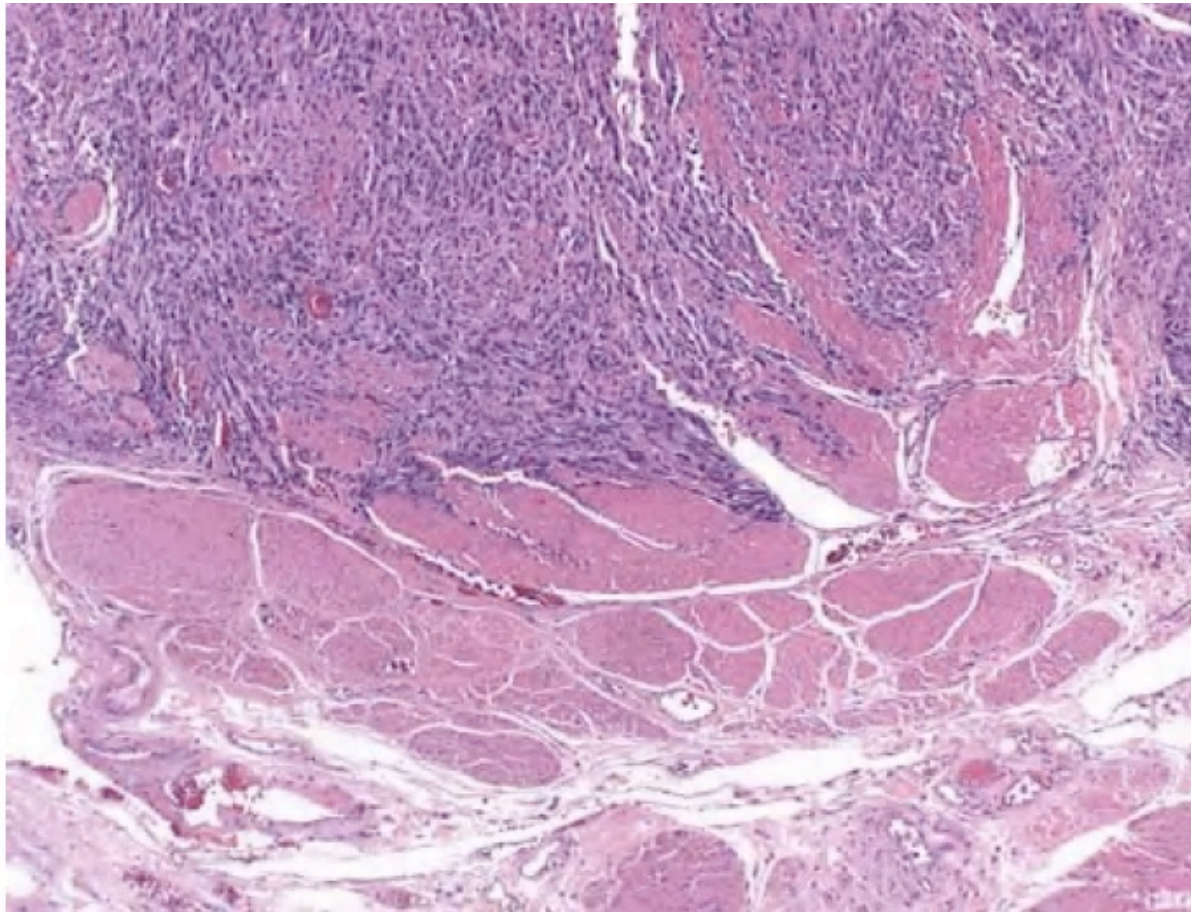
- **Rule 3**: Describe the tumour, size, shape, margin, surface:
  fungating/ulcerative, irregular border, covered by necrotic slough

- **Rule 4**: What the tumour do to the organ & surrounding?

The tumour occupied the bladder cavity, cause compression the ureteric orifice thus urine cannot flow to the bladder and lead to the hydronephrosis
The tumour may block the urethra lead to urinary obstruction

2. Describe the histopathological findings in photomicrograph A2 & A3 (a section taken from photomacrograph A1)

3. State your diagnosis

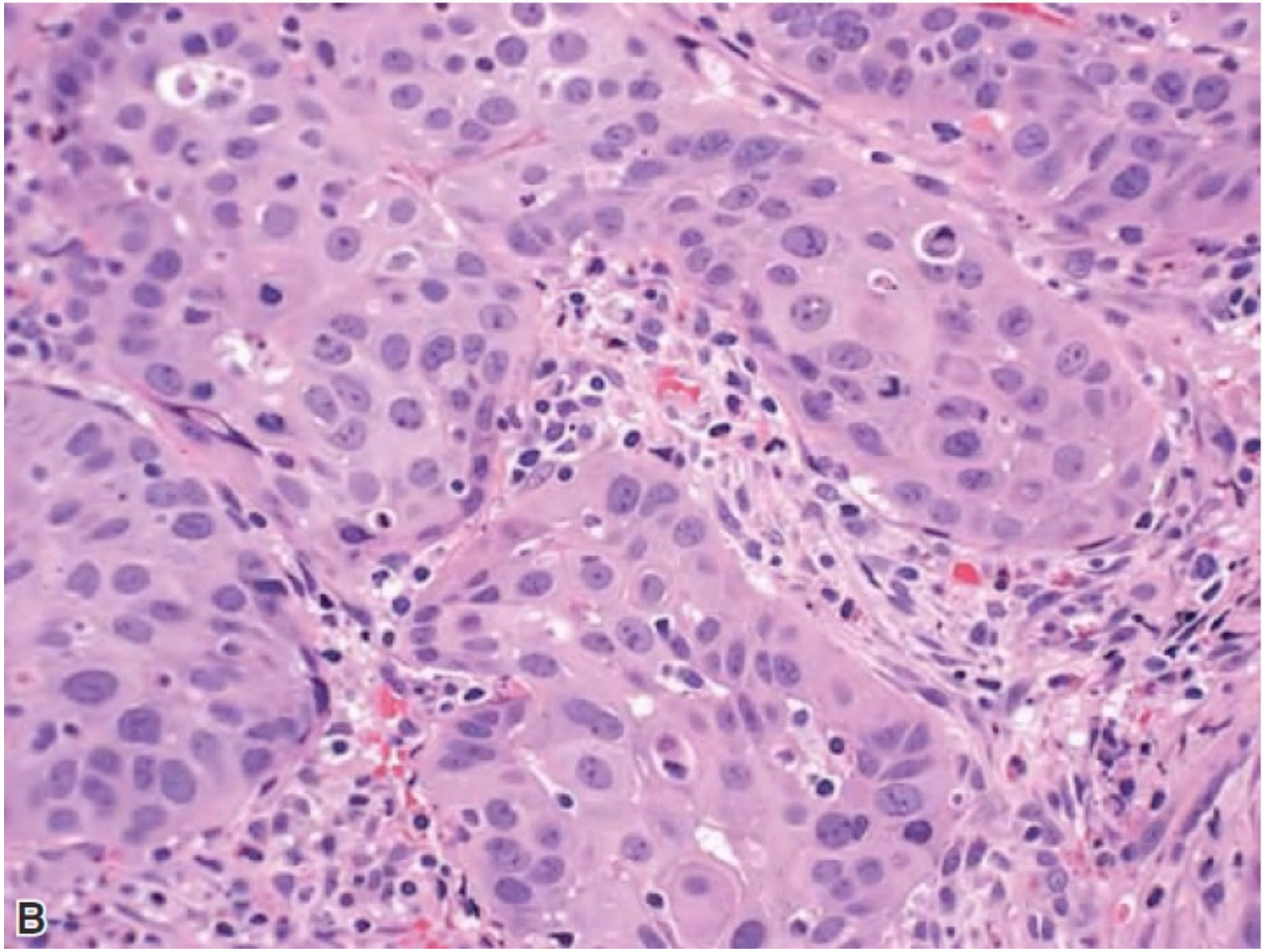


photomicrograph A2

The tumour arranged in nested and infiltrative into the muscularis propria.

The tumour cells exhibit moderate pleomorphic, enlarged vesicular nuclei with prominent nucleoli and abundant eosinophilic cytoplasm. Mitoses are seen

Invasive urothelial carcinoma, pT2



Invasive urothelial carcinoma

Give 5 risk factors that possible to cause bladder carcinoma

1. Cigarette smoking
2. Exposure to aromatic amines-e.g painters (in paint products)
3. *Schistosoma haematobium* infections
4. Long-term use of analgesics
5. Heavy long-term exposure to cyclophosphamide
6. Irradiation

Describe the molecular pathogenesis bladder tumour?

1. Non– muscle-invasive papillary cancers

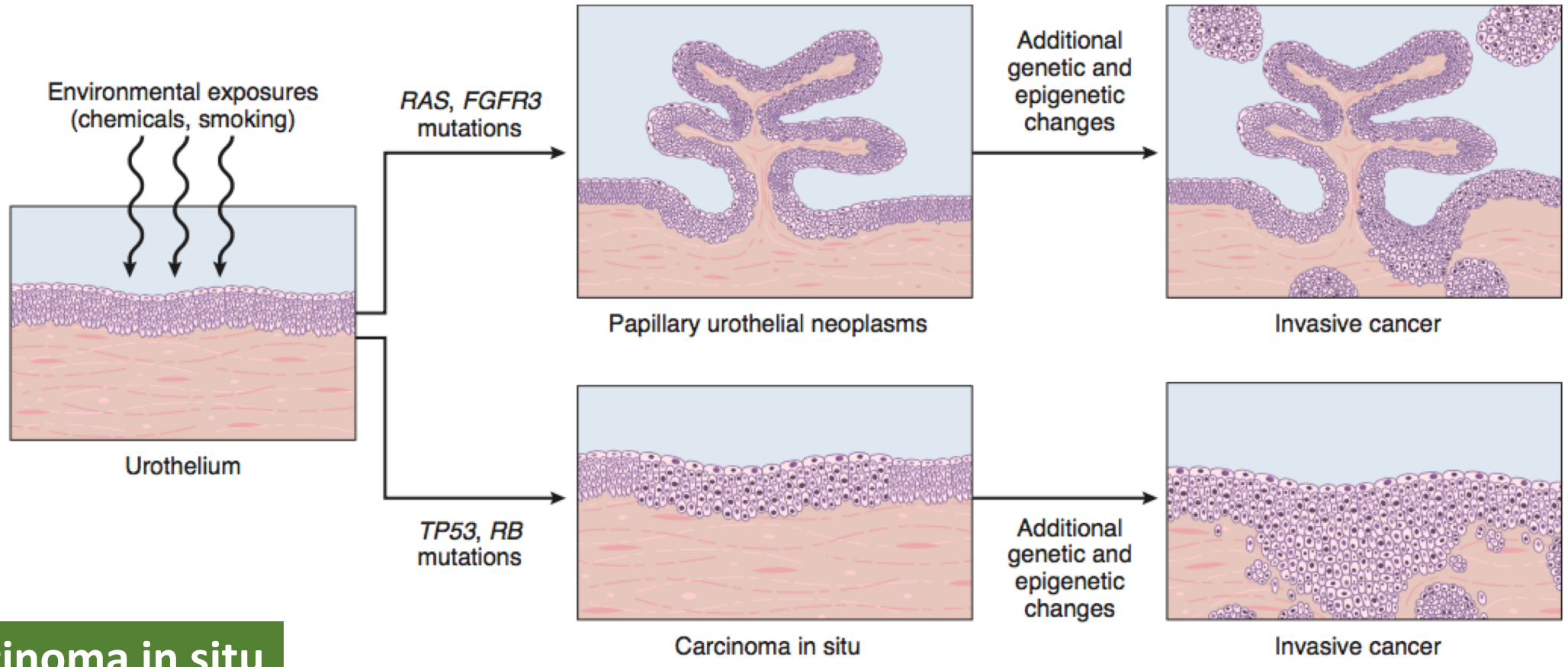
- amplifications of the **fibroblast growth factor receptor 3 (*FGFR3)*,** tyrosine kinase receptor gene) and activating mutations in the genes encoding RAS and PI 3-kinase.

2. Carcinoma in situ

- Mutations of **p53 and RB** → CIS →invasive urothelial cancers

Molecular pathways of tumor progression

Papillary urothelial neoplsms



Carcinoma in situ

photomacrograph A1

Question 3

18-year-old, male, presented with testicular mass.

1.Describe the gross morphological features of photomacrograph A1

- **Rule 1**: Identify the organ. Find the organ written in scenario if any.

Testis

- **Rule 2**: Identify the tumour and location:

Whole of testis replaced by the tumour

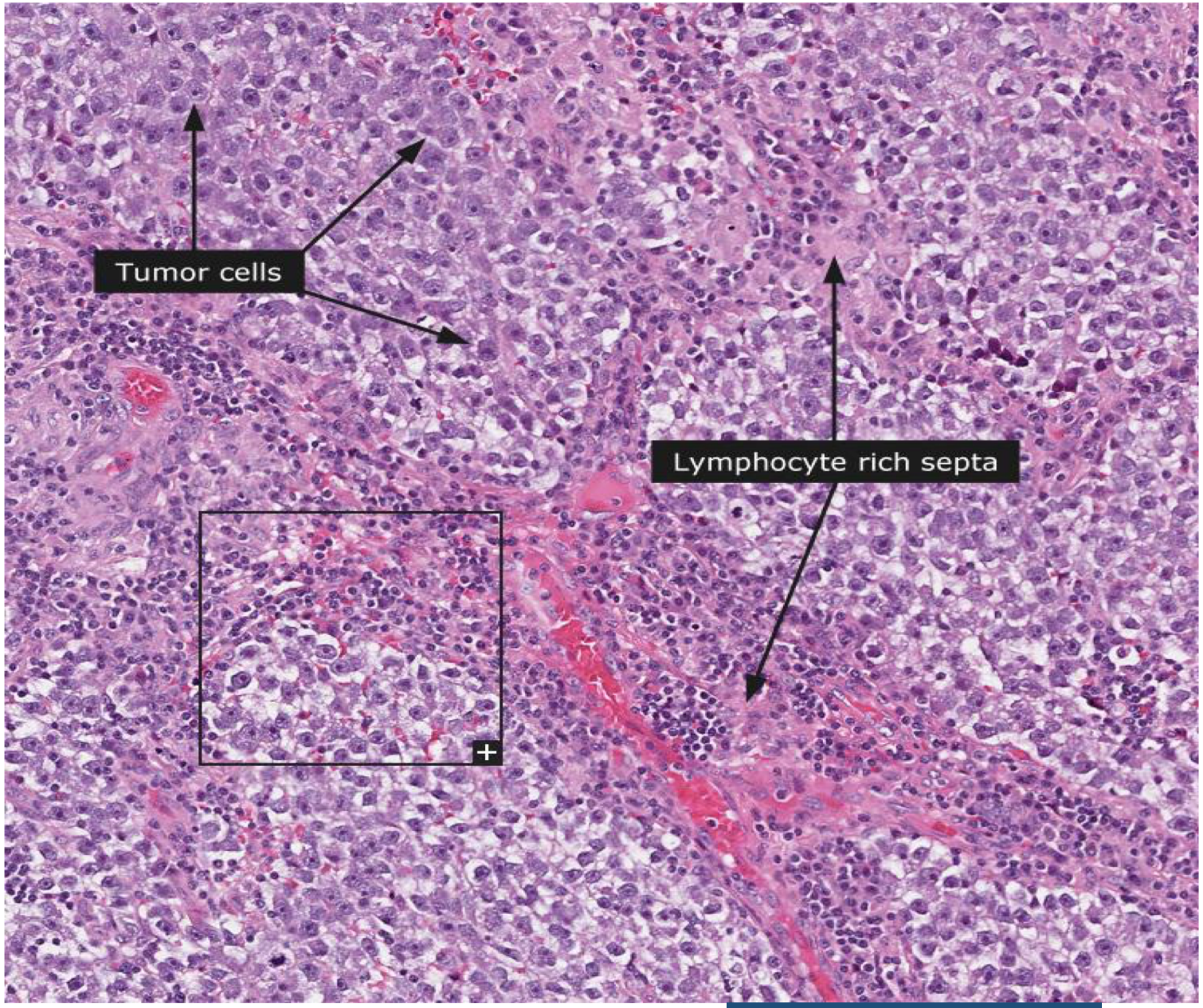
- **Rule 3**: Describe the tumour, size, shape, margin, surface:

bulky mass, gray-white, lobulatd cut surface (potato-like), devoid hemorrhage and necrosis

- **Rule 4**: What the tumour do to the organ & surrounding?

Any extension/ infiltration to the epididymis, tunica albuginea, tunica vaginalis, scortum, spermatid cord

- Male 36 years, Right radical orchidectomy. Specimen: Testis. Macroscopic description: Testis 56g, 60 x 45 x 20mm. Solid, pale, tumour 40 x 35 x 15mm.
- https://www.virtualpathology.leeds.ac.uk/slides/library/view.php?path=%2FResearch_4%2FTeaching%2FEQA%2FGeneral_Histopathology%2FHisto_EQA_CircU%2F125126.svs



photomicrograph A2

Think: white colour

Microscopic:

Low magnification: composed of sheets of uniform cells divided into lobules by delicate septa of fibrous tissue containing a moderate amount of lymphocytes.

Cells are:

- large round to polyhedral
- distinct cell membrane
- **clear** or watery-appearing cytoplasm
- a large, central nucleus with one or two prominent nucleoli.
- cytoplasm contains varying amounts of glycogen

- Mitoses vary in frequency.

Seminoma

Embryonal carcinoma

Question 4

22-year-old, male, presented with testicular mass.

Describe the gross morphological features

- **Rule 1**: Identify the organ. Find the organ written in scenario if any.

Testis

- **Rule 2**: Identify the tumour and location:

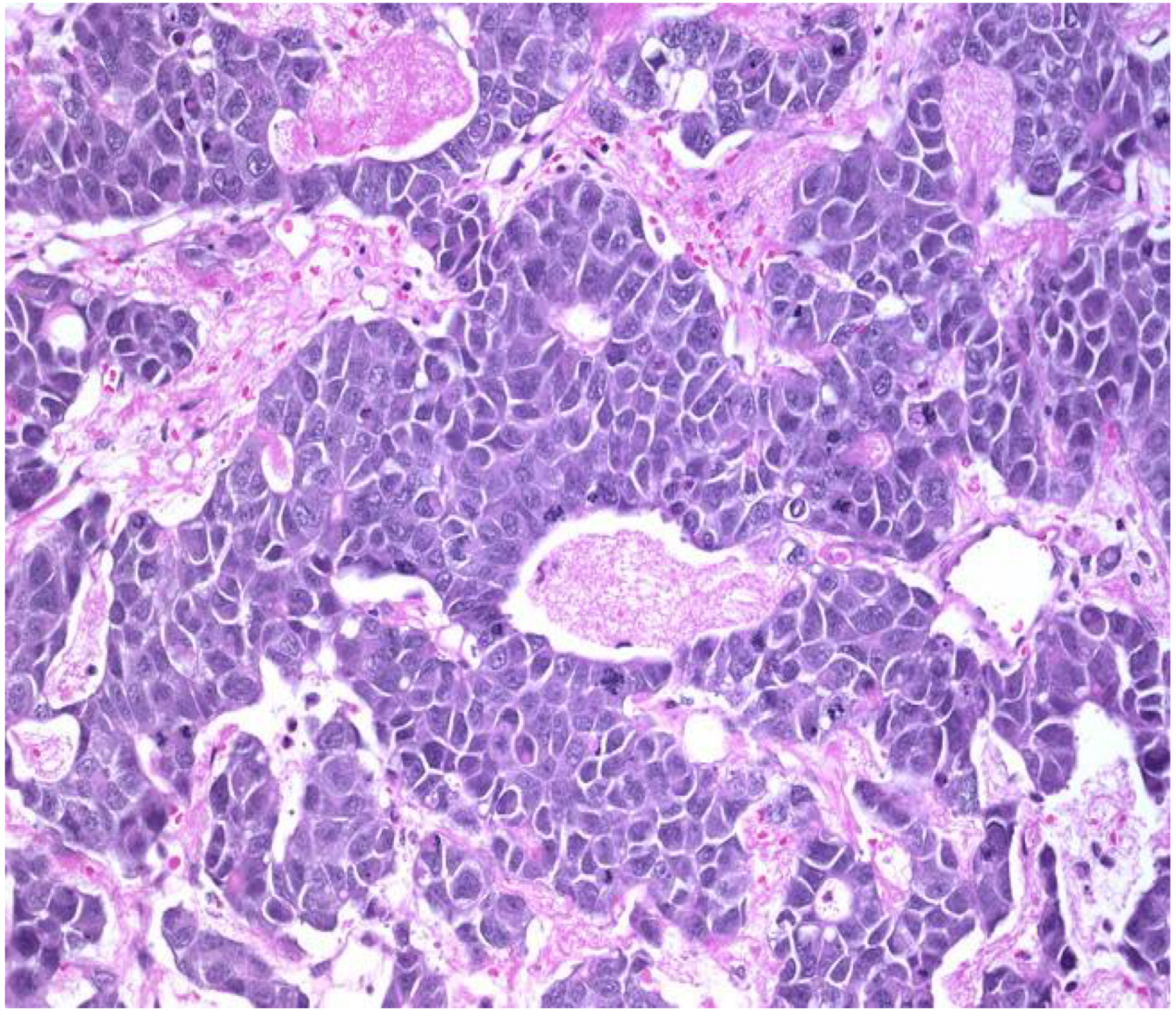
Tumour located at the center of testis with adjacent normal testis parencmymal

- **Rule 3**: Describe the tumour, size, shape, margin, surface:

Cut surface: variegated, poorly demarcated margin, foci of hemorrhage or necrosis

- **Rule 4**: What the tumour do to the organ & surrounding?

Any extension/ infiltration to the epididymis, tunica albuginea, tunica vaginalis, scortum, spermatid cord



Think: purple colour

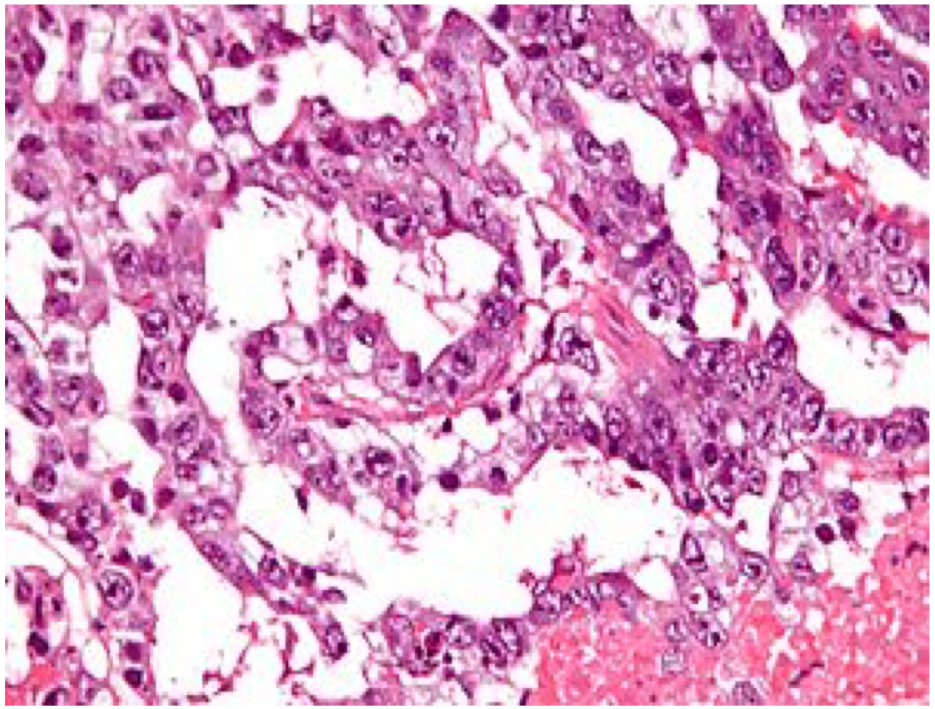
2.Describe the histopathological findings in photomicrograph A2 (a section taken from photomacrograph A1)

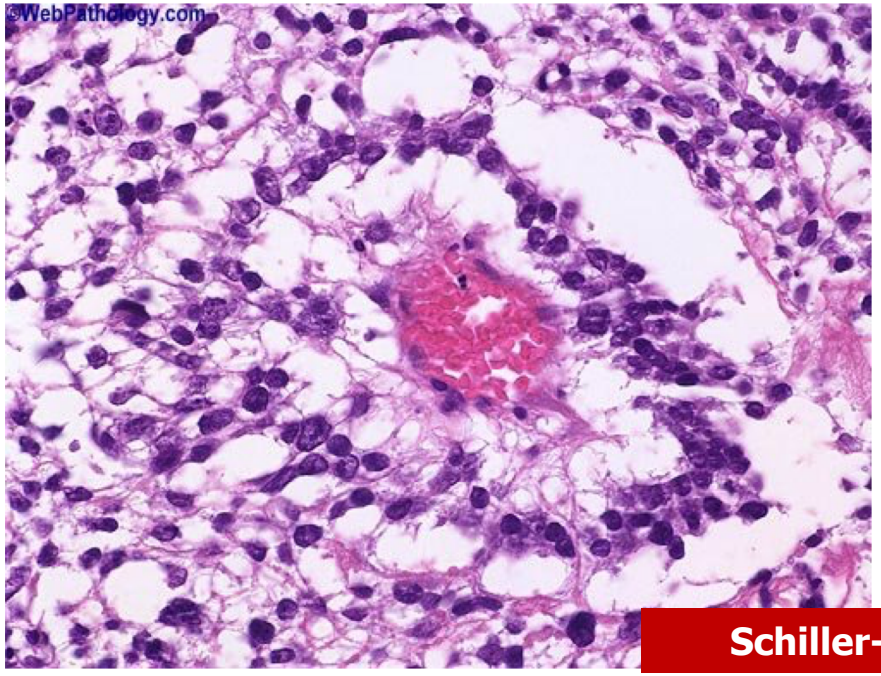
Microscopic

- sheets of undifferentiated cells/primitive cells
- Variable architecture (nests, sheets, papillae, gland)
- The nuclei are large and hyperchromatic
- Mitotic figures and tumor giant cells are frequently seen.
- IHC: CD30 +ve

3.State your diagnosis?

Embryonal carcinoma





Schiller-Duval bodies

Question 5

18-year-old, male, presented with testicular mass.

1.Describe the histopathological findings in photomicrograph A1 and A2.

- Lacelike (reticular) network
- papillary structures, solid cords of cells, and other less common patterns may be found.
- Medium-sized cuboidal or flattened cells.
- 50% of tumors show structures resembling endodermal sinuses (Schiller-Duval bodies - hallmark)

2.State your diagnosis

Yolk sac tumour

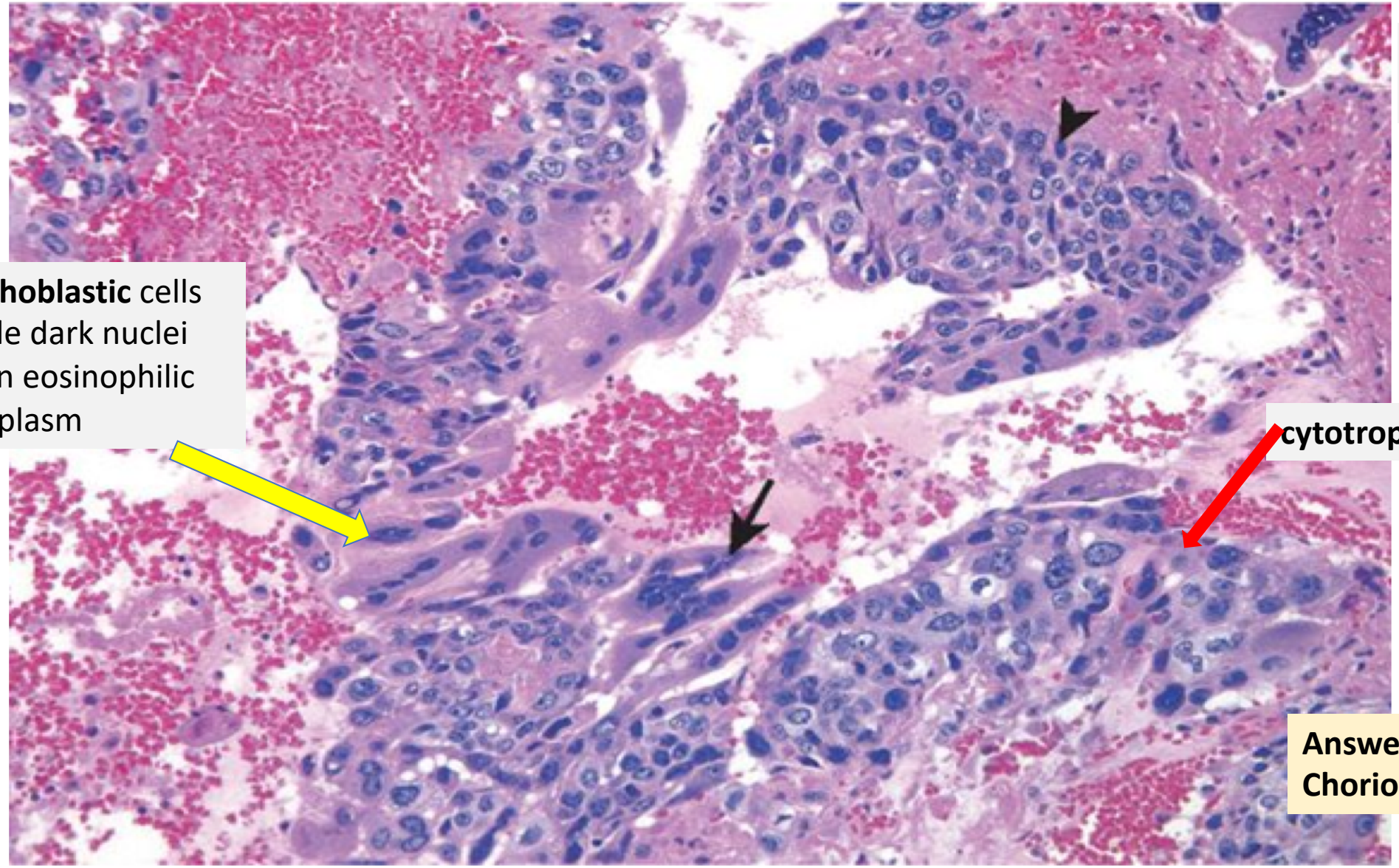
Question 6

20-year-old, male, presented with testicular mass.

1. Describe the histopathological findings in photomicrograph A1

2. State your diagnosis

Describe the microscopic findings of the photomicrograph provided below:



Hemorrhage and necrosis

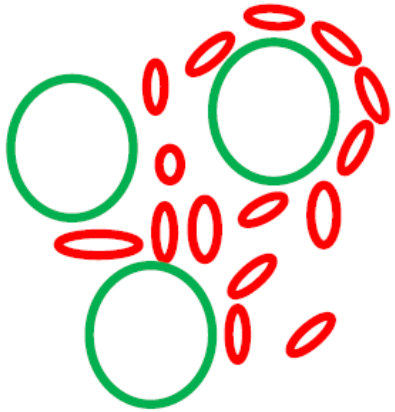
syncytiotrophoblastic cells with multiple dark nuclei embedded in eosinophilic cytoplasm

cytotrophoblastic cells

Answer: Choriocarcinoma

Think: red colour

Gleason pattern 3 : discrete well formed glands

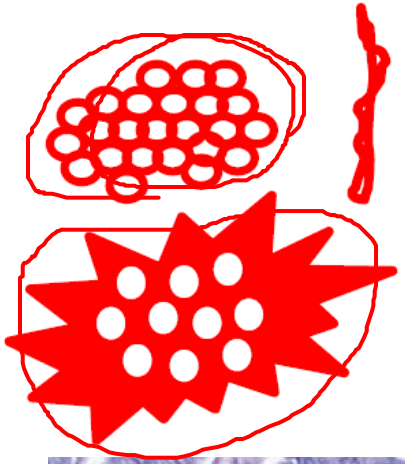


Question 7

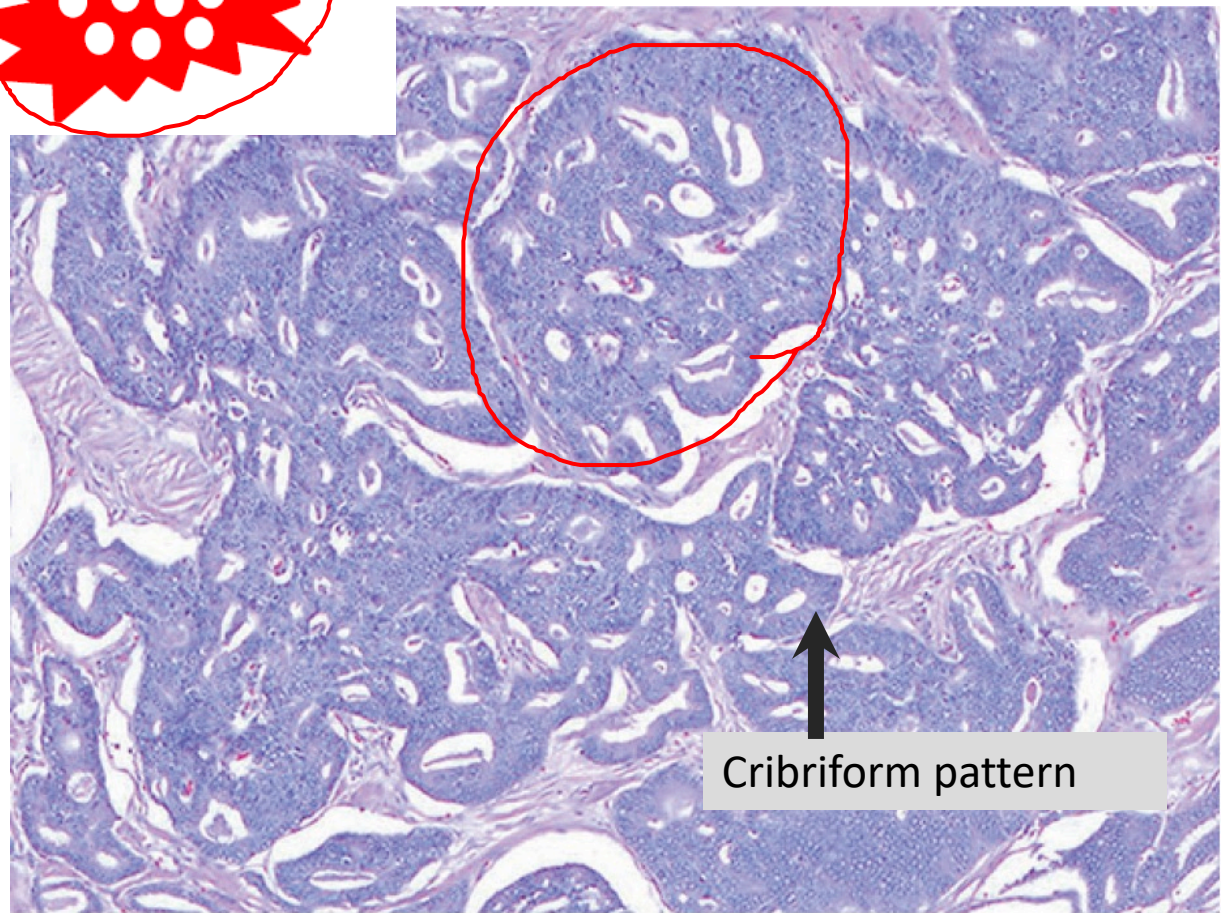
This 63-year-old man had an elevated PSA and an indurated prostate on rectal examination. Biopsies were taken.

1. Describe the histopathological findings in photomicrograph above
2. What is the diagnosis?

Prostatic adenocarcinoma, Gleason score 6 (3 3) Grade group: 1



Gleason pattern 4: Cribriform/poorly formed/fused glands



Large irregular cribriform glands with well-formed lumina

Question 8

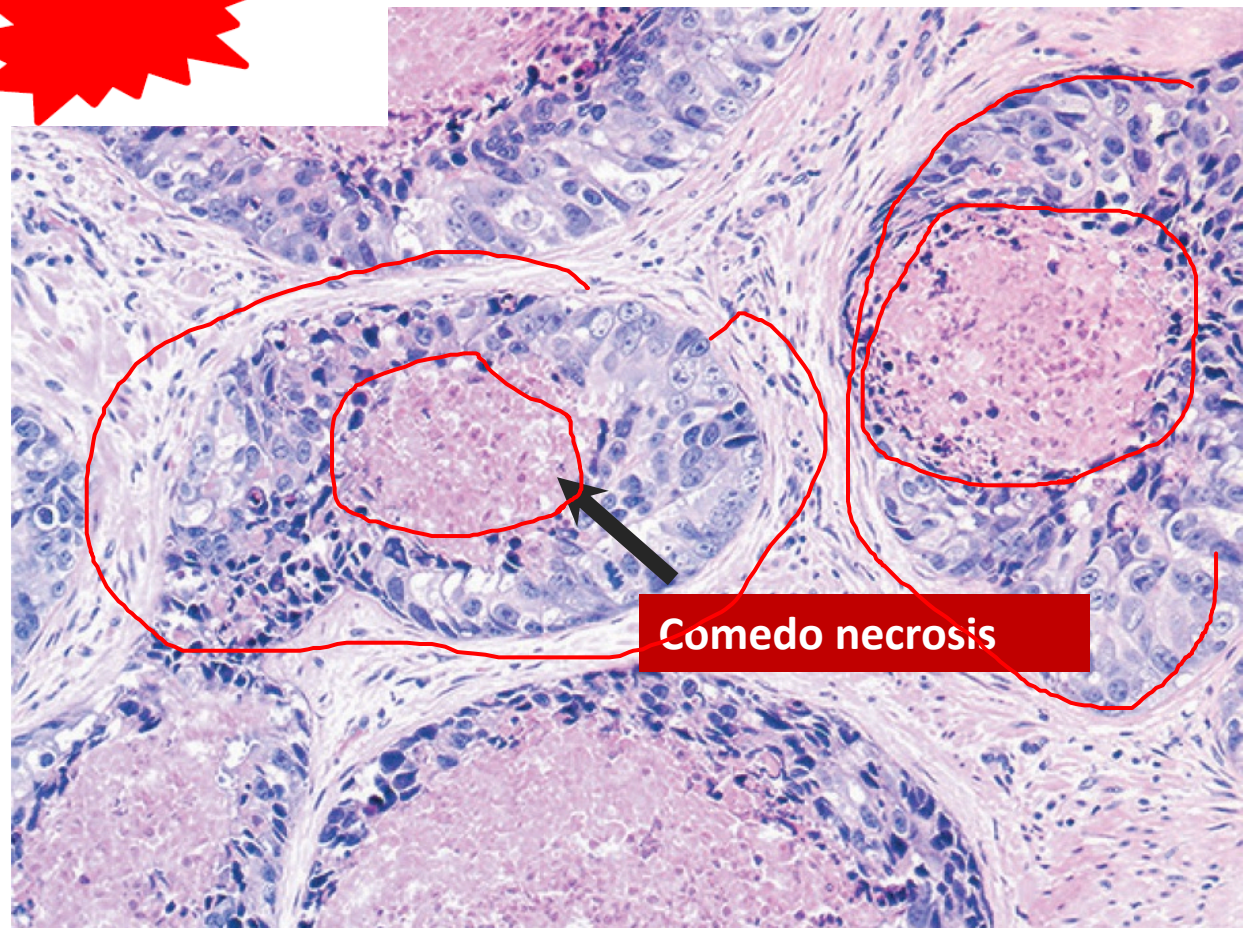
This 60-year-old man had an elevated PSA and an indurated prostate on rectal examination. Biopsies were taken.

1. Describe the histopathological findings in photomicrograph provided.

2. What is the diagnosis?

Prostatic adenocarcinoma, Gleason score 8 (4+4), Grade group: 4

Gleason pattern 5: sheets/cord/ single cells/solid nests/necrosis



Solid nests with comedonecrosis

Question 9

This 60-year-old man had an elevated PSA and an indurated prostate on rectal examination. Biopsies were taken.

1. Describe the histopathological findings in photomicrograph provided.

2. What is the diagnosis?

Prostatic adenocarcinoma, Gleason score 10 (5+5), Grade group: 5

Most tumors contain more than one pattern, thus a **primary grade** is assigned to the dominant pattern, and a **secondary grade** is assigned to the second most frequent pattern.

The two numeric grades are then added to obtain a combined Gleason score

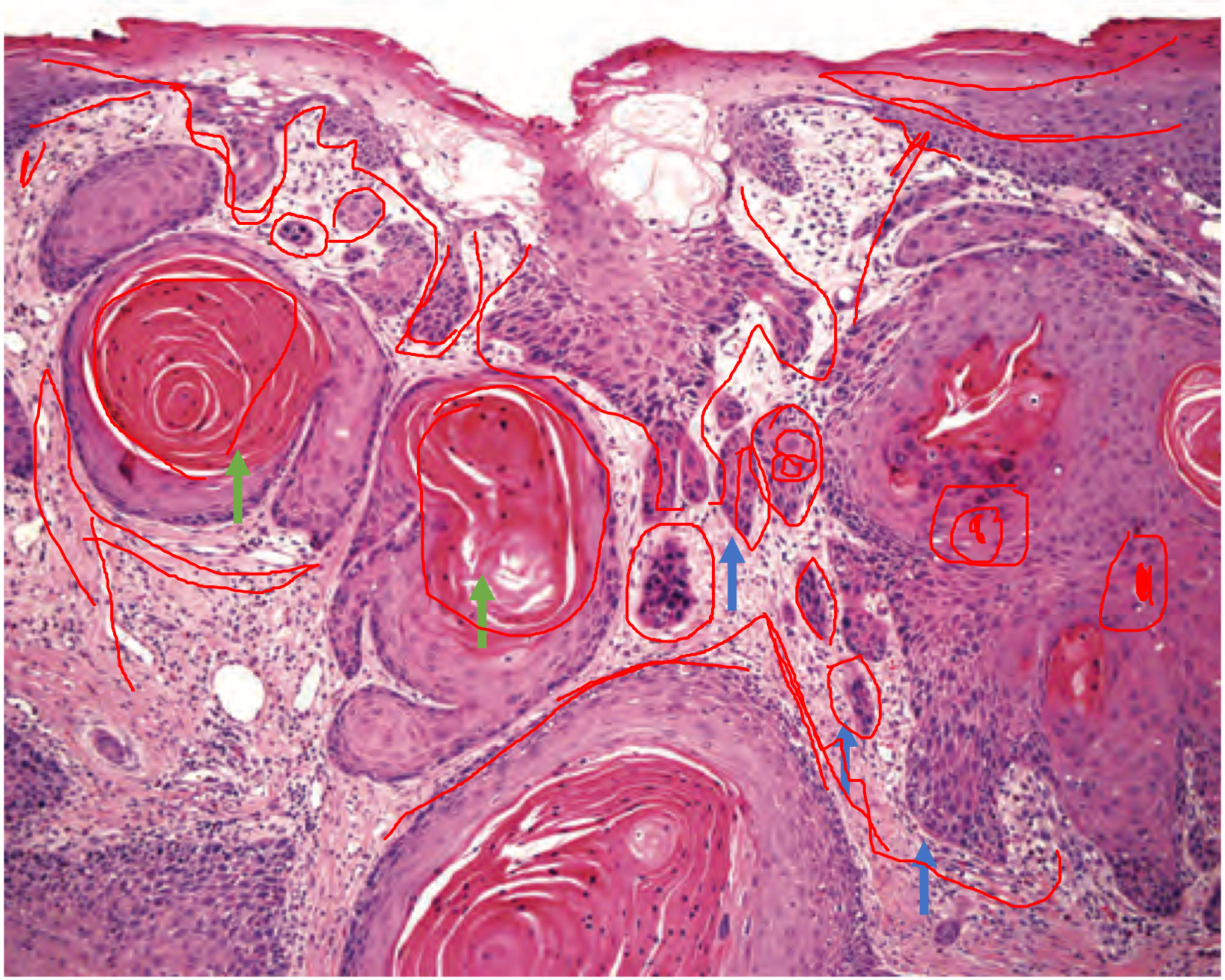
e.g primary grade (3) + secondary grade (grade 4)= 7 (3+4)

Grade group: 3

Table 21.8 Prostate Cancer Gleason Grade Groups

- Grade Group 1 (≤6)
  Only individual discrete well-formed glands
- Grade Group 2 (3 + 4)
  Predominantly well-formed glands with a lesser component of poorly formed, fused or cribriform glands
- Grade Group 3 (4 + 3)
  Predominantly poorly formed/fused/cribriform glands with a lesser component of well-formed glands
- Grade Group 4 (4 + 4/3 + 5/5 + 3)
  Only poorly formed/fused/cribriform glands or predominantly mix of well-formed glands and lack of glands
- Grade Group 5 (4 + 5/5 + 4/5 + 5)
  Lack gland formation (or with necrosis) with or without poorly formed/fused/cribriform glands

https://www.virtualpathology.leeds.ac.uk/slides/library/view.php?path=%2FResearch_4%2FTeaching%2FEQA%2FEast_Midlands%2FCirculation_J%2F186494.svs



Question 10

A 57-year-old male with case of difficulty in voiding urine and penile pain. Biopsies were taken.

1. Describe the histopathological findings in photomicrograph provided.

2. What is the diagnosis?

Squamous cell carcinoma, well differentiated

Thank you