Pathology Of The Male genital system

Dr. Mohanad Mahdi

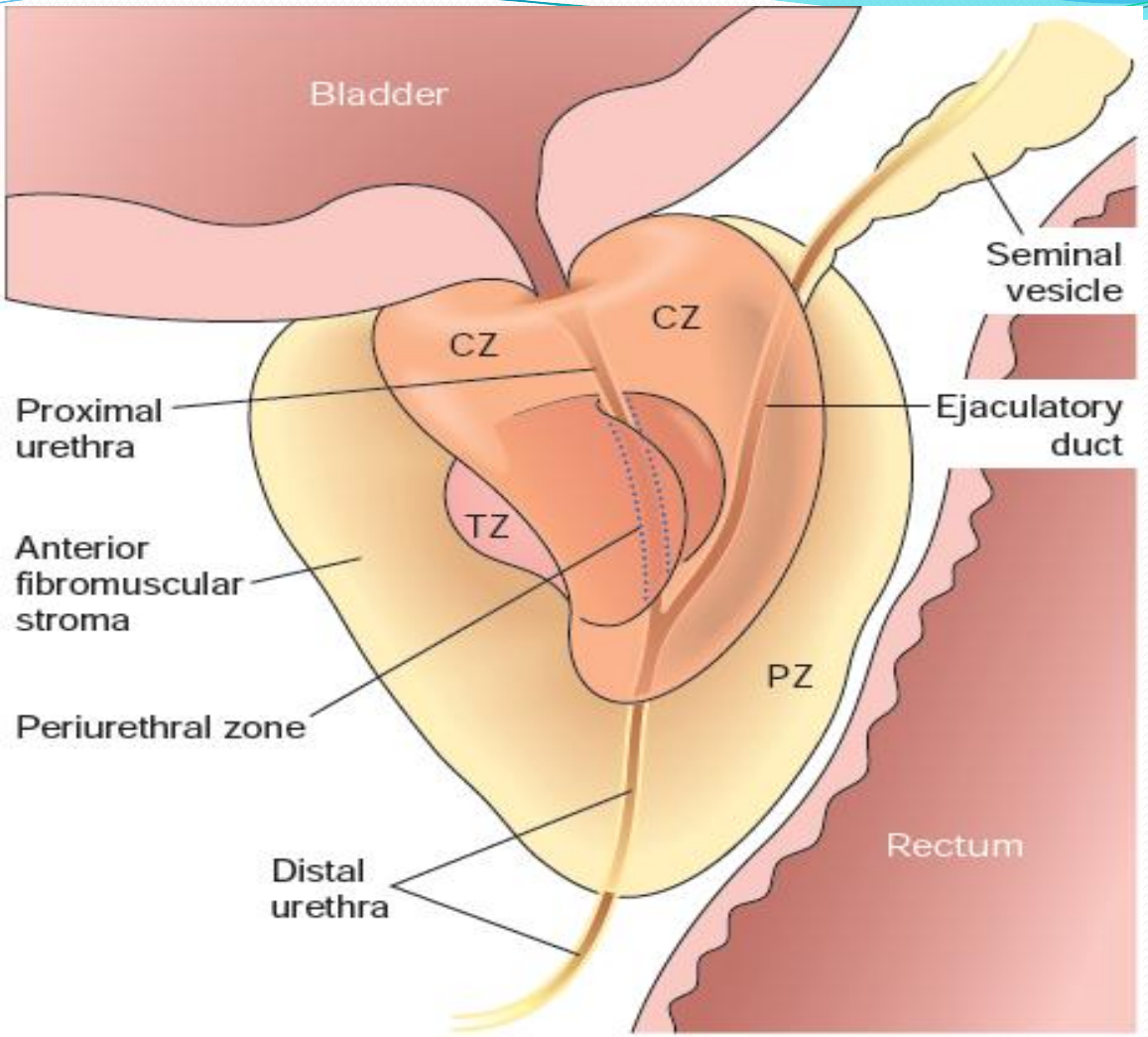
Nodular hyperplasia of the prostate.(benign proatatic hypertrophy …BPH).

- **Normal histology:**

The prostatic parenchyma can be divided into several biological distinct regions, include the peripheral , central, transitional, & periurethral zones.

- ***Site:*** Most of BPH lesions arise in the ***transitional, & central zones***. .

- ***Age:*** BPH frequency rises with age, reaching 90% by the eight decade of life.



Adult prostate

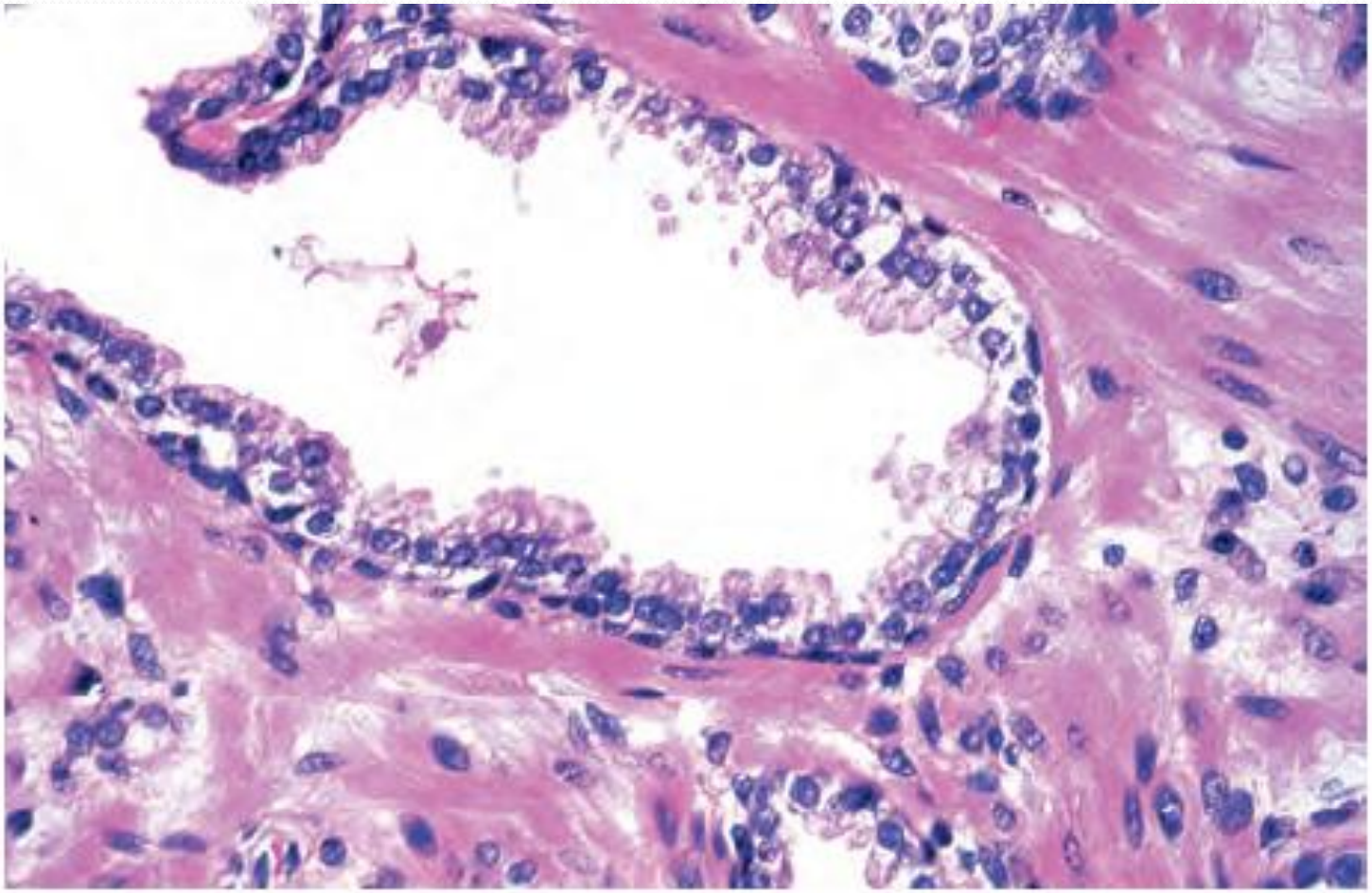


Figure 21-31 Benign prostate gland with basal cell and secretory cell layer.

Pathogenesis of nodular prostatic hyperplasia

androgen & estrogen play a synergistic role in development of prostatic hyperplasia. . *& this can be* ***proved by many facts,***

1. ***Intact testis*** is important for development of nodular hyperplasia.
2. ***Nodular hyperplasia does not occur in males with castrated testes*** before the onset of puberty.

Explanation:

1. ***Dihydrotesterone(DHT) & its metabolite 3alpha- androstandiol***, appear to be the major hormonal stimuli for glandular & stromal proliferation in patient with nodular hyperplasia.
2. Age related increases in the estrogen levels……..increasing expression of DHT receptors on prostatic glandular & stromal cells……..enhancing the effects of DHT (experiment).

Clinical features.

Only 10% of men are showing clinical features of prostatic hyperplasia.

- features are divided into

I. obstructive symptoms.

II. Irritative symptoms.

Morphology of Nodular Prostatic Hypeplasia.

Gross.

The prostate is ***enlarged*** (300 grams or more , normal: 20 grams).

The cut surface contains ***multiple, well circumscribed nodules,***

Mic.

- In BPH both glandular & fibromuscular stroma tissues are proliferated within hyperplastic nodules.
- However the hyperplastic glands maintain their double layer lining & contain inspissated, proteineous material called **Corpora amylacea** in their lumina.

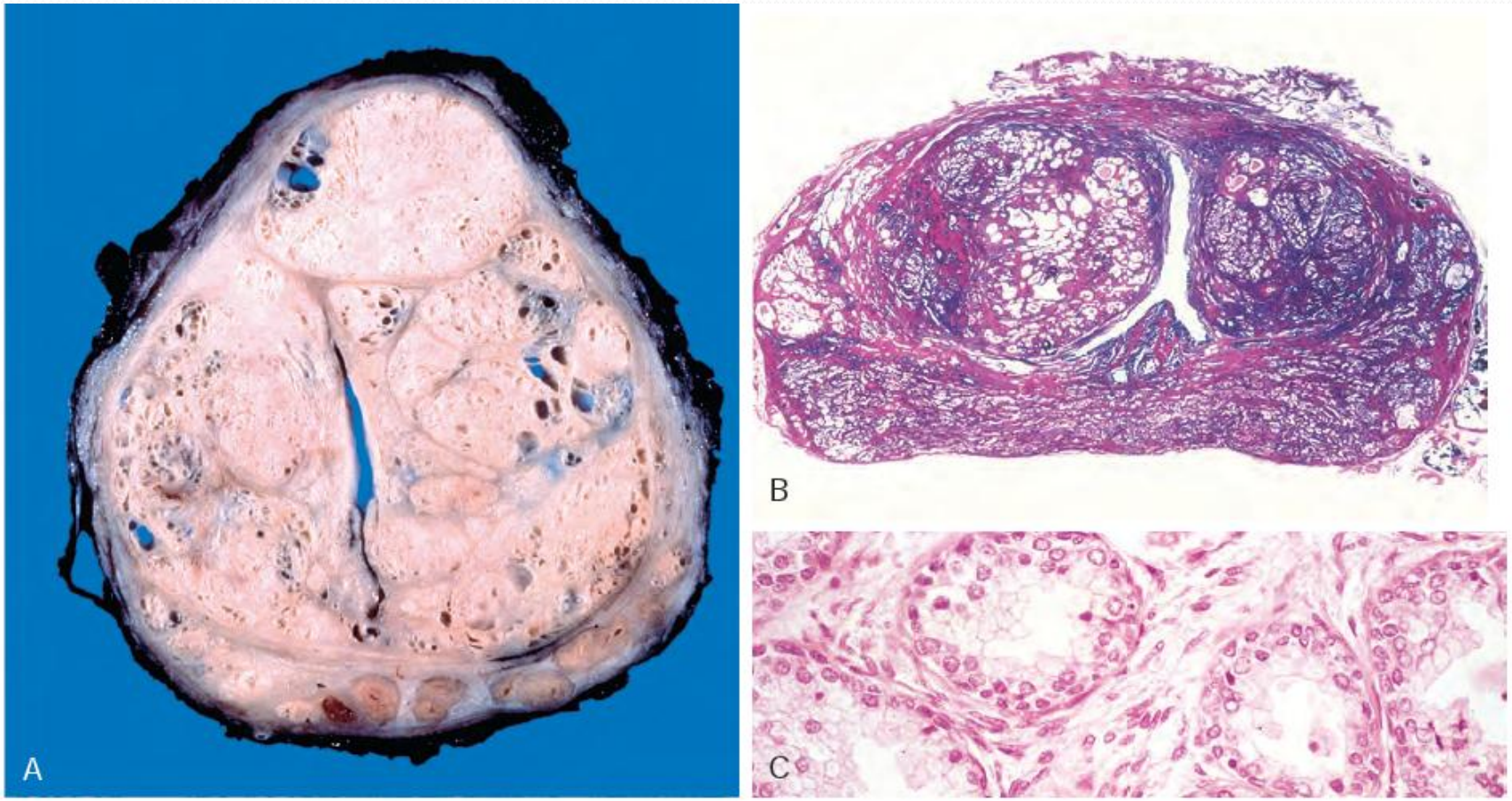
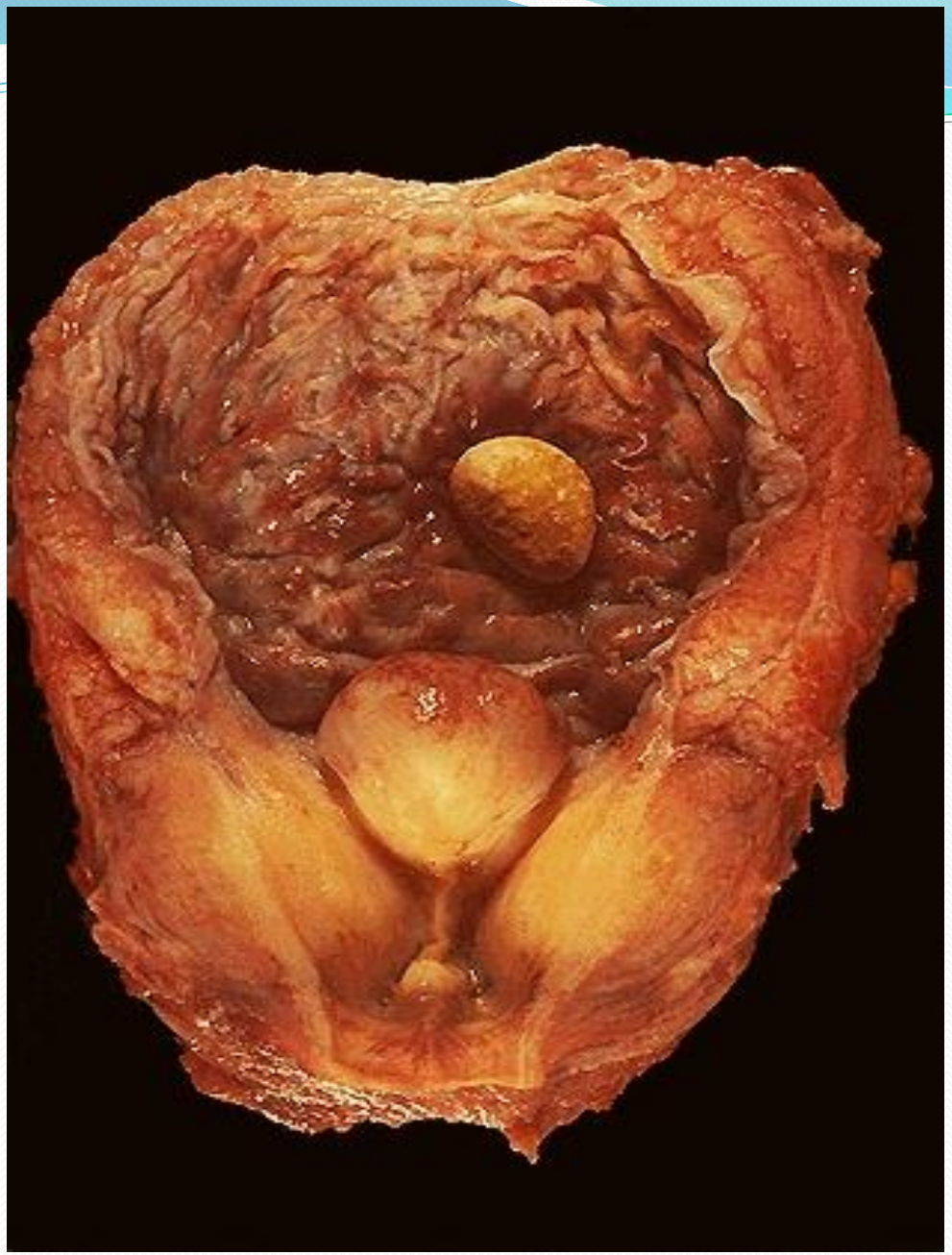
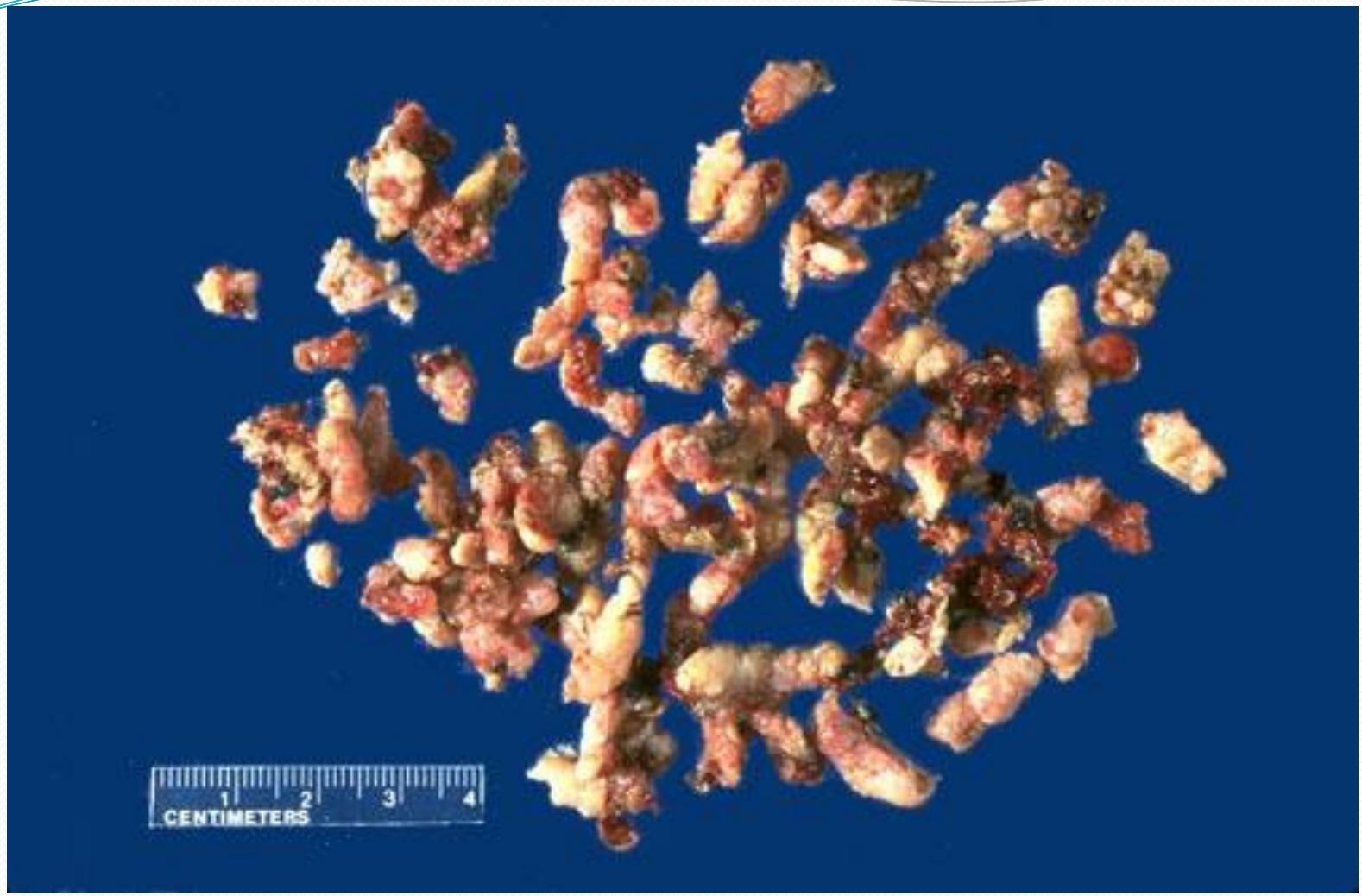


Figure 21-33 Nodular prostatic hyperplasia. **A,** Well-defined nodules of benign prostatic hypertrophy compress the urethra into a slitlike lumen. **B,** A microscopic view of a whole mount of the prostate shows nodules of hyperplastic glands on both sides of the urethra. **C,** Under high power the characteristic dual cell population: the inner columnar and outer flattened basal cell can be seen.

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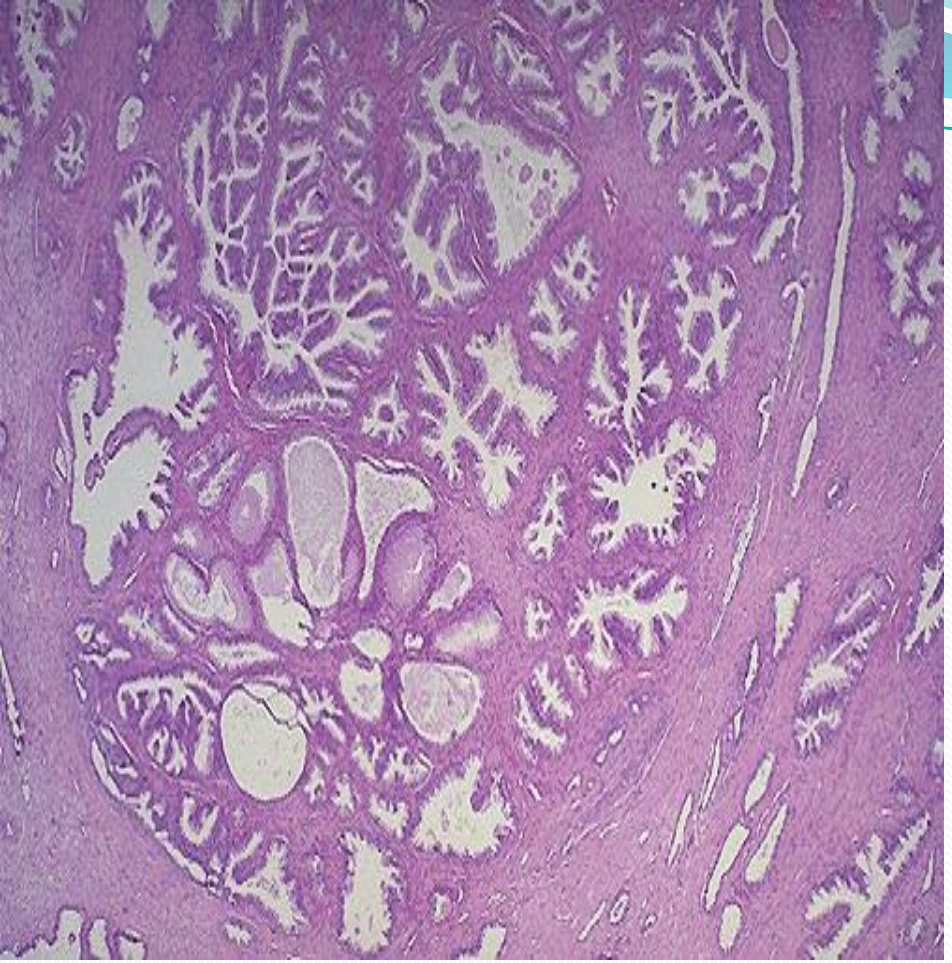
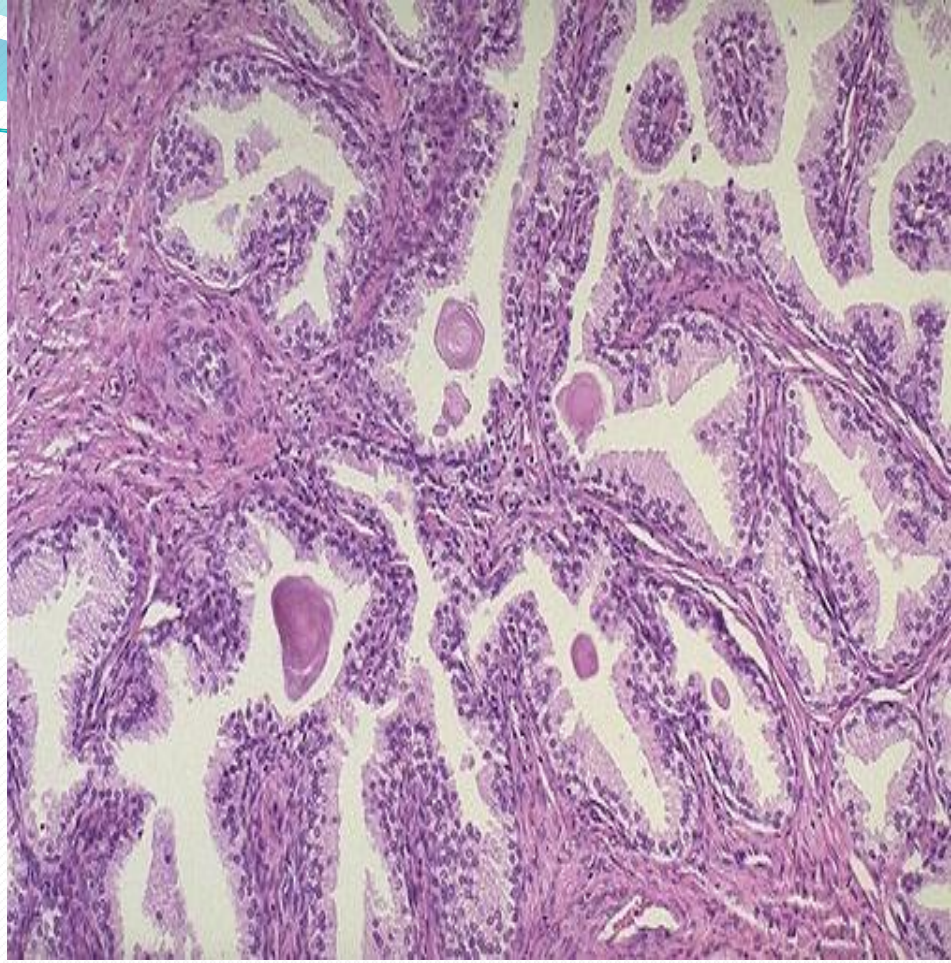
CENTIMETERS





Carcinoma of prostate.

- ***most common visceral cancer in males.***
- ***second most common cause of cancer related deaths in men older than 50 years of age, after carcinoma of the lung.***

Etiology.

1. ***Hormonal factors.*** Are suggested by the following facts,

   I. Cancer of prostate ***does not develop in males castrated before the puberty, indicating that androgen likely play a part in its development.***

   II. The growth of many carcinomas of prostate ***can be inhibited by orchiectomy or by the administration of estrogens.***

2. ***Genetic factors.***

- increased risk of disease among first degree relatives of patients.
- Occur at earlier age in American blacks than in whites, & Asian.

3. ***Environmental factors.***

- Increased with ***certain industries*** (Cadmium).
- significant ***geographic differences*** in the incidence of disease.
- Prostatic carcinoma are ***not associated with sexually transmitted diseases, diet, & nodular hyperplasia.***

Clinical features. According to stage of cancer:

1. During early stages/ mainly silent/ diagnosed incidentally on routine digital rectal examination, because most of cancers occure at peripheral area of gland.
2. More extensive disease/produce ***prostatism*** (local discomfort, & urinary obstructive symptoms).

3. More aggressive carcinomas/ discovered due to metastases (bone metastases, which are commonly to axial bones.

Important Note:

Bone metastases of prostatic carcinoma are either

I. ***osteolytic (destructive) lesion.***

II. ***osteoblastic (bone producing) lesion***, COMMONEST one & indicate advanced cancer.

4. Other sites of metastases are ***lung/pleura***, liver, adrenal, ***lymph nodes & Perinural invasion*** is very common (in 85% of cases), is suggested of extraprostatic extension.

Screening tests.

- Screening tests for diagnosis of prostatic carcinomas are.
  1. PSA serum levels.
  2. Digital rectal examination.
  3. transrectal sonography & needle biopsy.
- ***All these tests should be used in combination in diagnosis of prostatic carcinomas.***

Morphology of prostatic carcinomas

Gross.

- About 70% to 80% of prostatic carcinomas arise in the outer (peripheral) glands & hence may be palpable as irregular hard nodules by rectal digital examination.
- Because of peripheral location of prostatic caner is less likely to cause urethral obstruction in its initial stages than is nodular hyperplasia.
- Early lesions typically appear as ill-defined masses just below the capsule of the gland.
- locally advanced cancers often infiltrate the seminal vesicles & periurethral zones of the prostate & the wall of the urinary bladder.

Mic

- Most cases showing variable degrees of differentiation, ranging form well differentiated (small glands with irregular infiltration of stroma) to anaplastic carcinoma (irregular shaped glands and single cells).

These Malignant glands are differed from the normal & hyperplastic glands by,

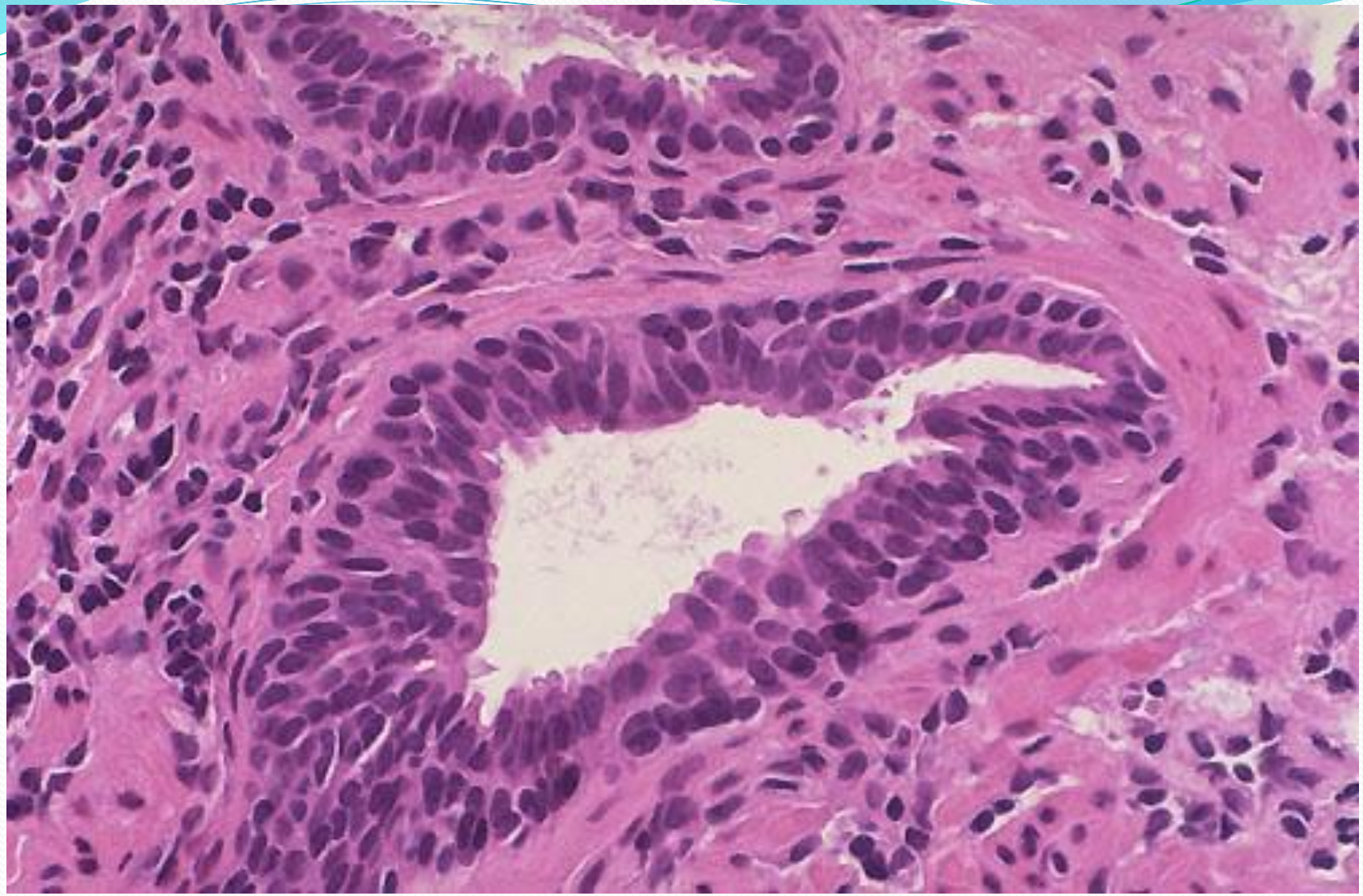
1. There is ***no intervening stroma between malignant glands (back to back pattern of growth).***
2. ***The malignant glands are lined by a single layer of cuboidal cells with conspicuous nucleoli, with absence of the basal cell layer seen in normal or hyperplastic glands.***

Grading of prostatic carcinoma.

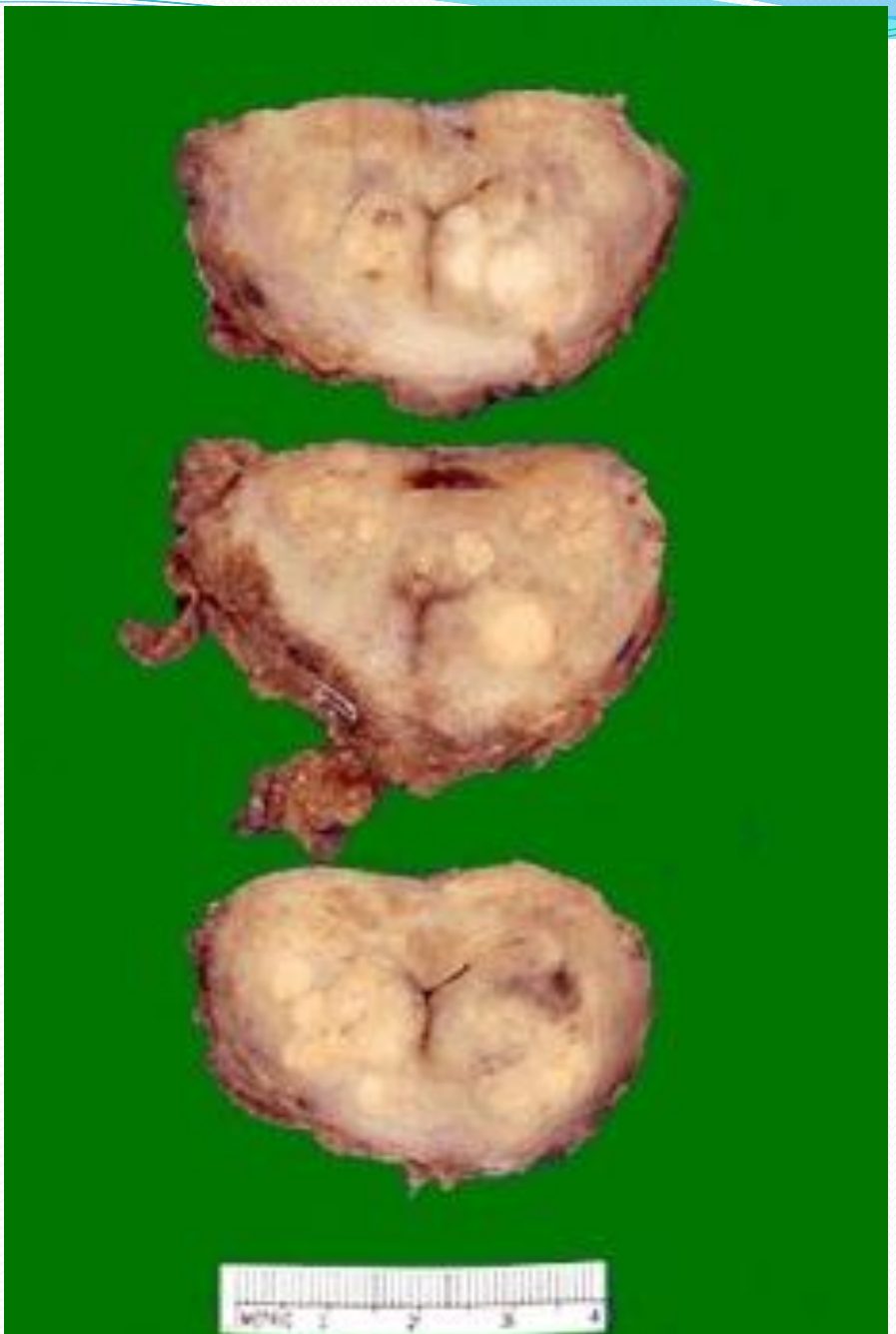
Gleason system, which depends on certain features, include

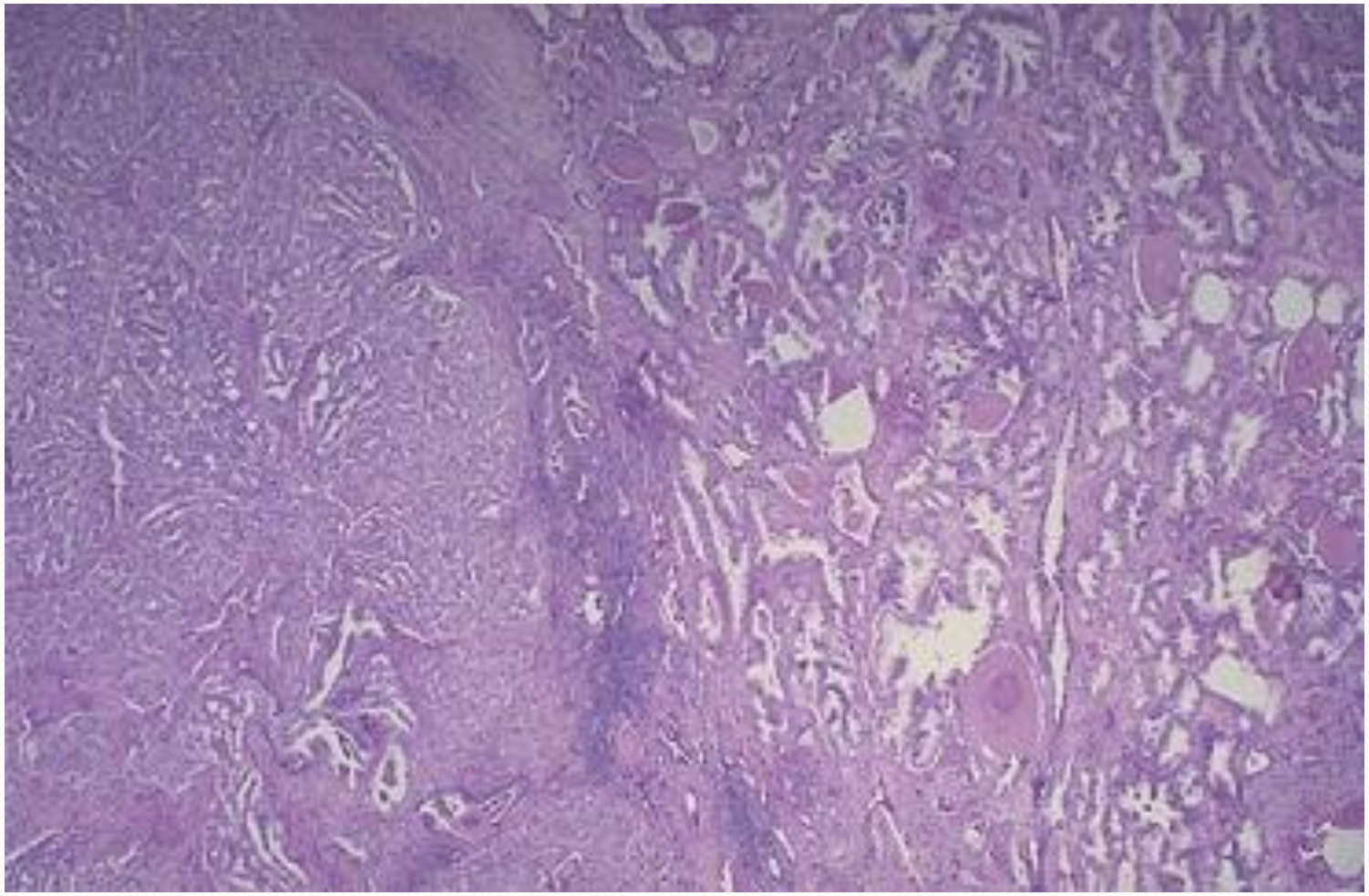
1. Degree of glandular differentiation
2. The architecture of the neoplastic glands
3. Nuclear grading & mitotic activity.

Gleason system is consisting of five grades.

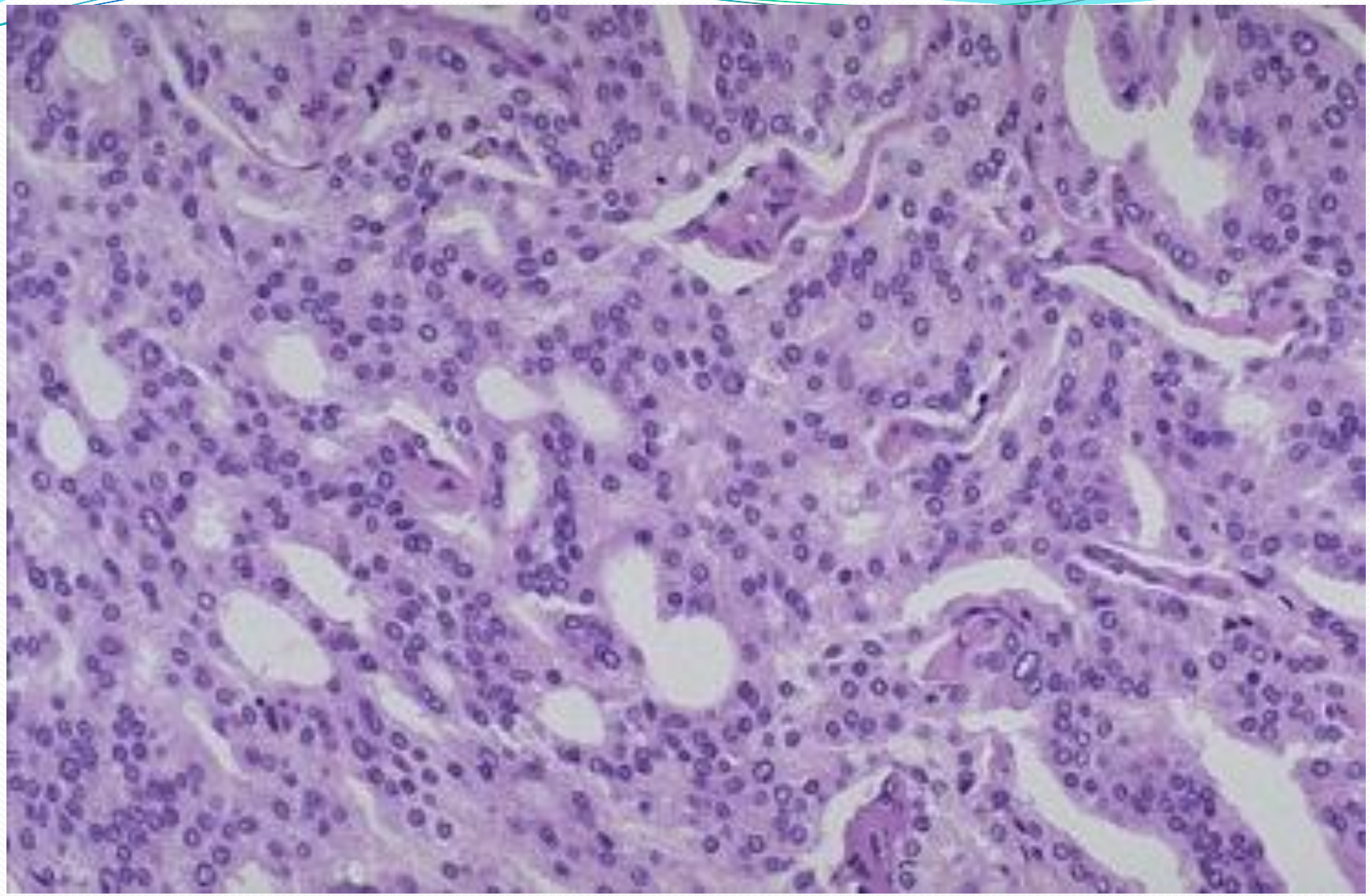


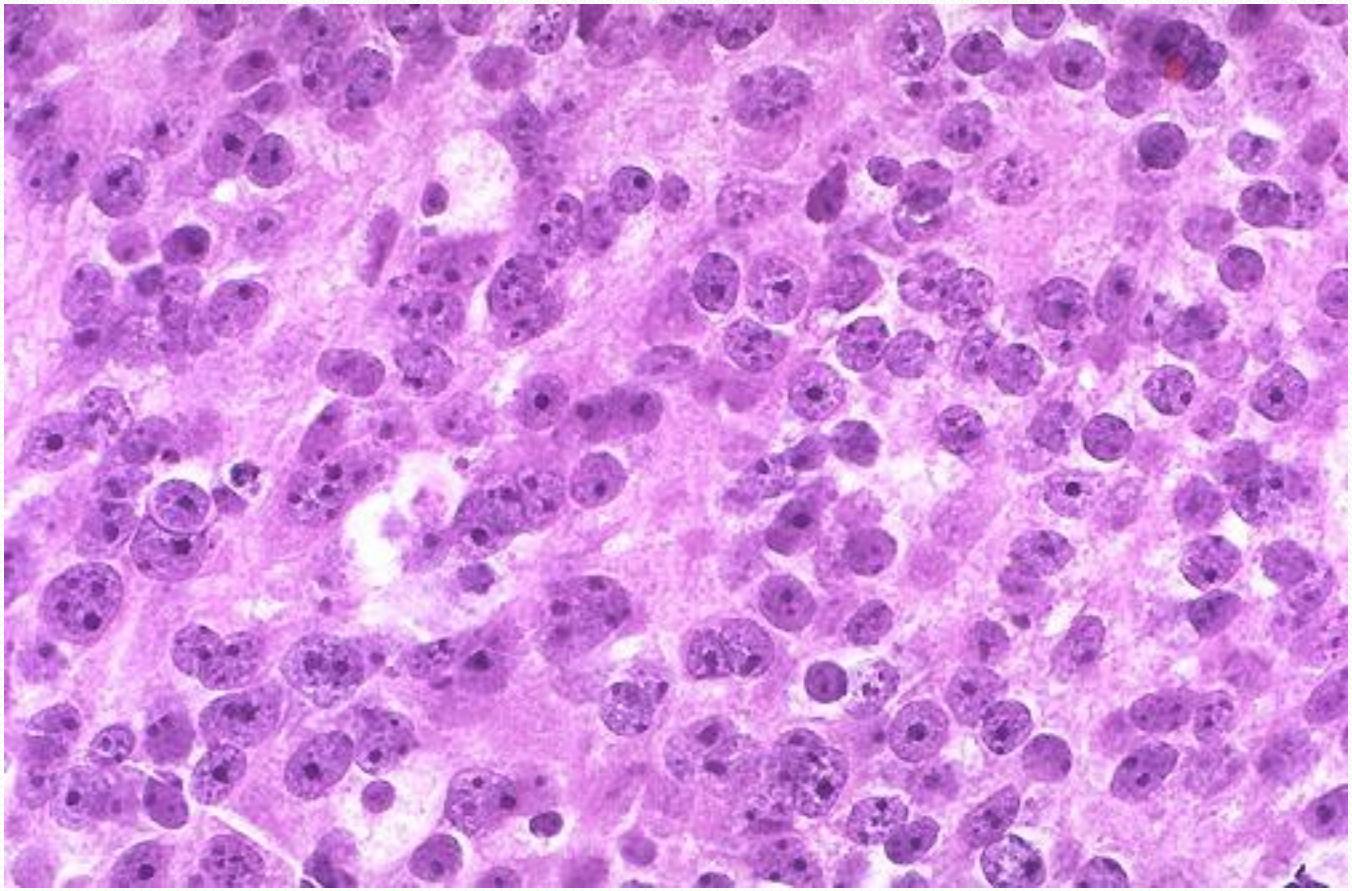
Prostatic intraepithelial neoplasia (PIN) =precursor of prostatic carcinoma

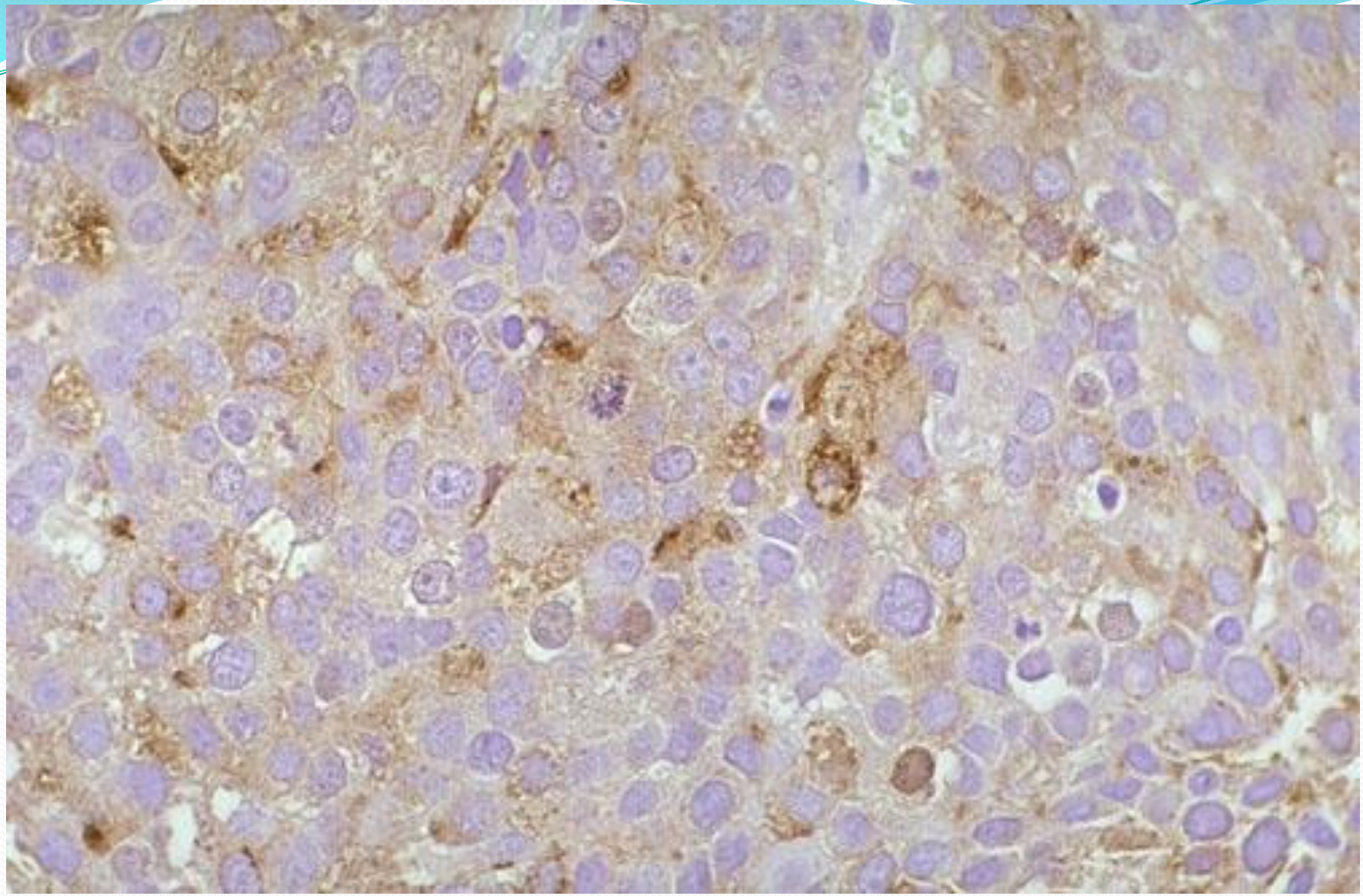


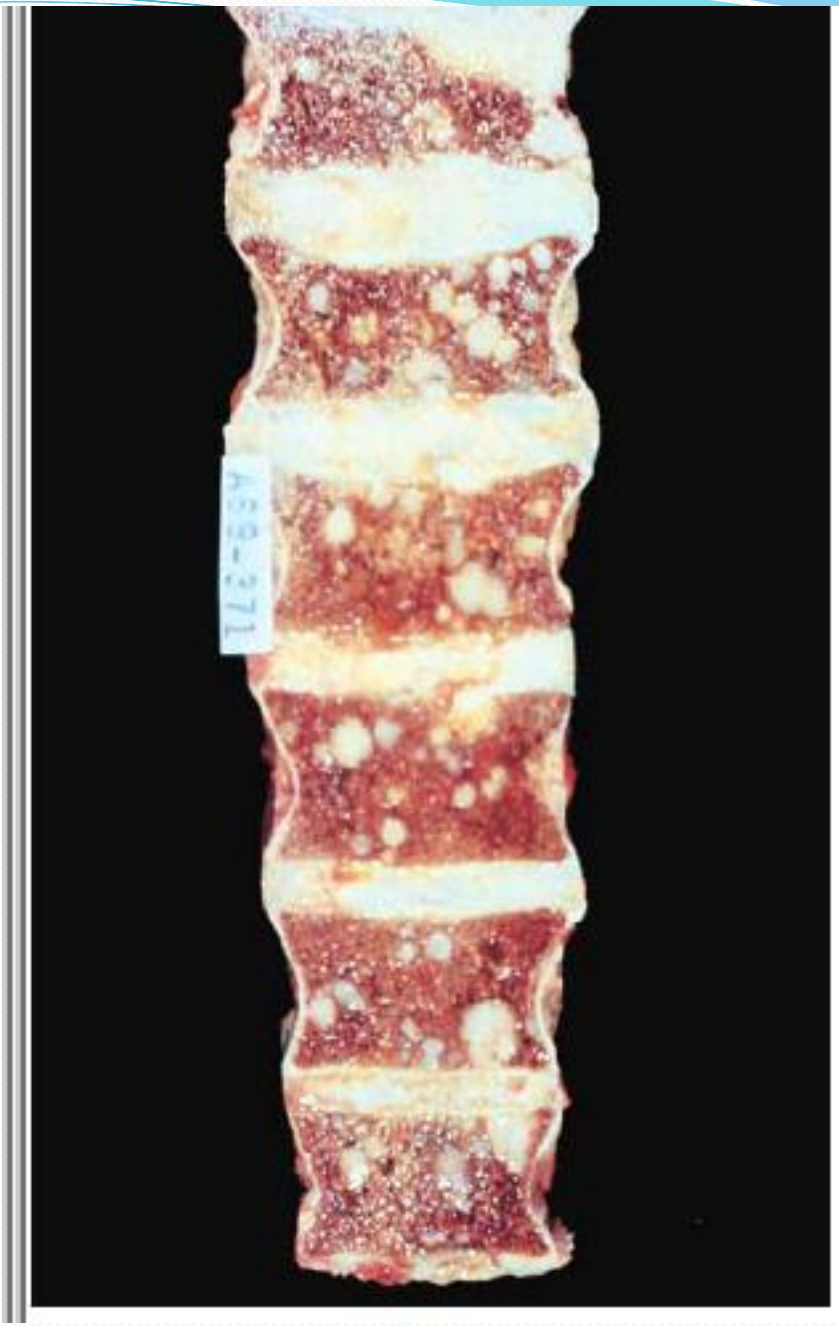


Prostatic carcinoma (left) and benign prostate to the right








AGE-174

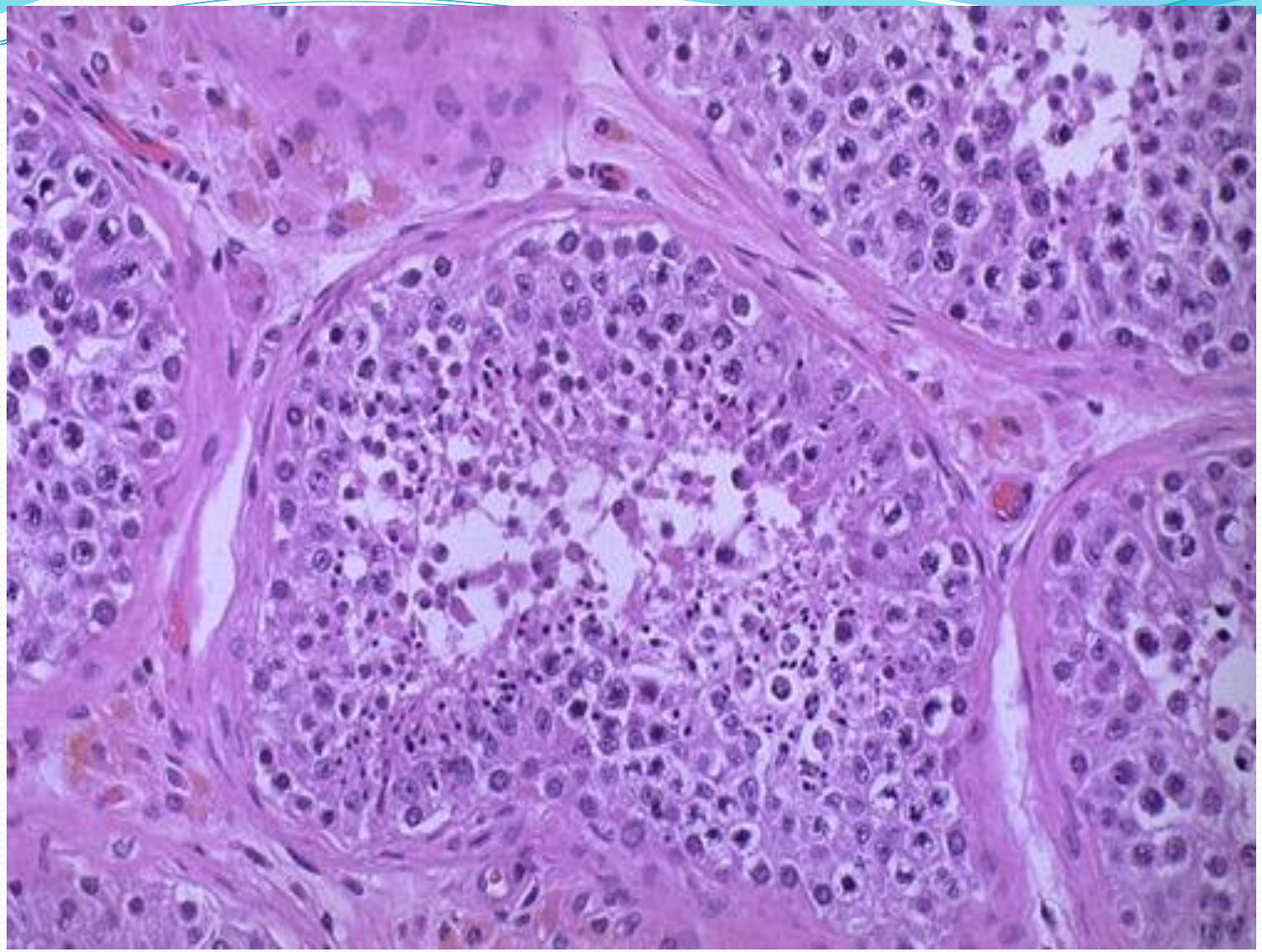
Testes pathology

Normal testicular tissue:

- 250 lobule.
- 4 tubule in each lobule.
- Each tubule is composed of:

Basement membrane ,sertoli cells ,germ cells .

- The interstitial cells are (Leydig cells).



Cryptorchidism

- Cryptorchidism is a complete or partial failure of the intra-abdominal testes to descend into the scrotal sac and is associated with **testicular dysfunction(sterility) and an increased risk of testicular cancer.**
- It is found in approximately 1% of 1-year-old boys.
- Cryptorchidism is unilateral in most cases.
- Morphologically : changes appear at 2 years of age

➢ germ cell development **arrested** ,tubules undergo **hyalinization** ,and the whole testis **atrophied becoming small and firm**

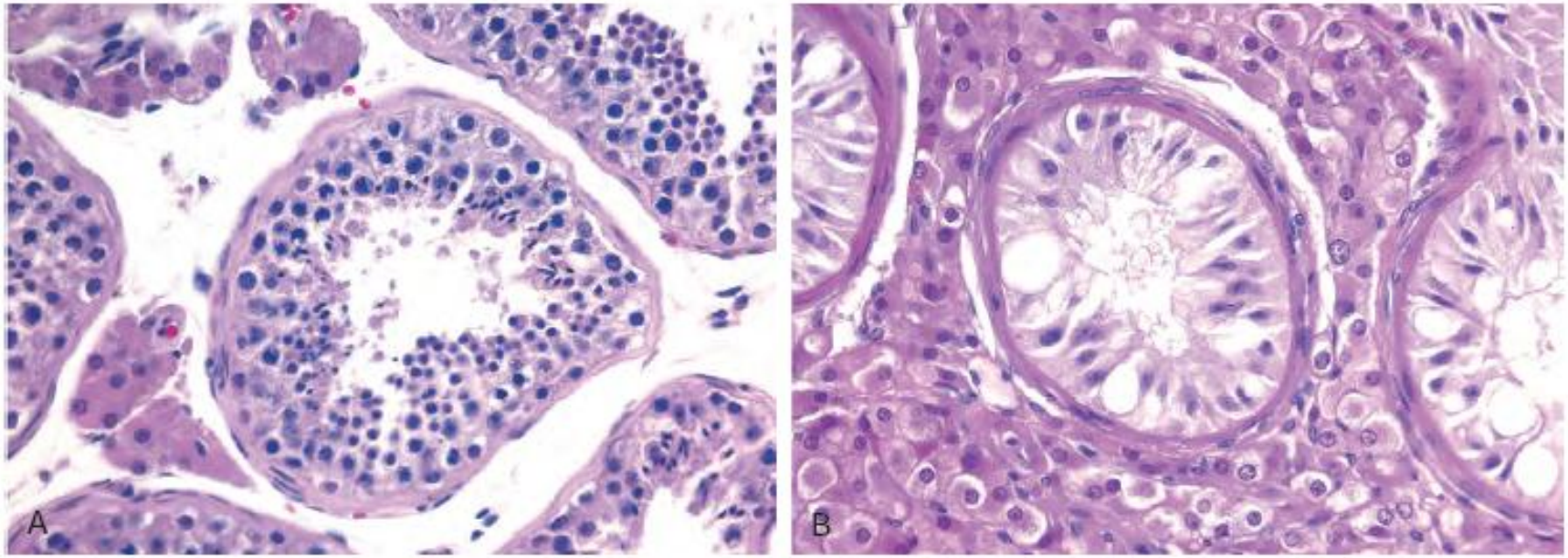


Figure 21-20 **A,** Normal testis shows tubules with active spermatogenesis. **B,** Testicular atrophy in cryptorchidism. The tubules show Sertoli cells but no spermatogenesis. There is thickening of basement membranes and an apparent increase in interstitial Leydig cells.

- The cryptorchid testis carries a 3- to 5-fold higher risk for testicular cancer, which arises from foci of intratubular germ cell neoplasia within the atrophic tubules.
- Risk of malignancy also increased in contralateral undescended testis
- Orchiopexy (repositioning of testis)reduces the risk of sterility and cancer.

Testicular Neoplasms.

- less than 1% of all male malignancies.
- 15 & 34 years
- more in whites than in blacks.
- 95% 0f these tumors arise from germ cells (aggressive but curable tumors) & 5% of testicular tumors sex cord- stromal tumors (usually benign tumors but associated with hormonal syndromes).

Causes of testicular neoplasia.

1. Cryptorchidism.
2. Testicular dysgenesis. Many syndromes are associated testicular dyegenesis & also associated with increased frequency of testicular malignancies.
3. Chromosomal abnormalities mainly chromosome NO. 12
4. Unknown causes

Classification of testicular neoplasia (WHO Classification).

1. ***Intratubular germ cell neoplasia .*** It is mean that the malignant changes are limited to the lining of seminiferous tubules, & it is now widely believed that most testicular tumors arise from intratubular germ cells tumors.
2. ***Seminoma*** (classic, tubular)
3. ***Spermatocytic seminoma***.
4. ***Non seminomatous germ cell tumors.***

    Embryonal carcinoma

    Yolk sac tumor

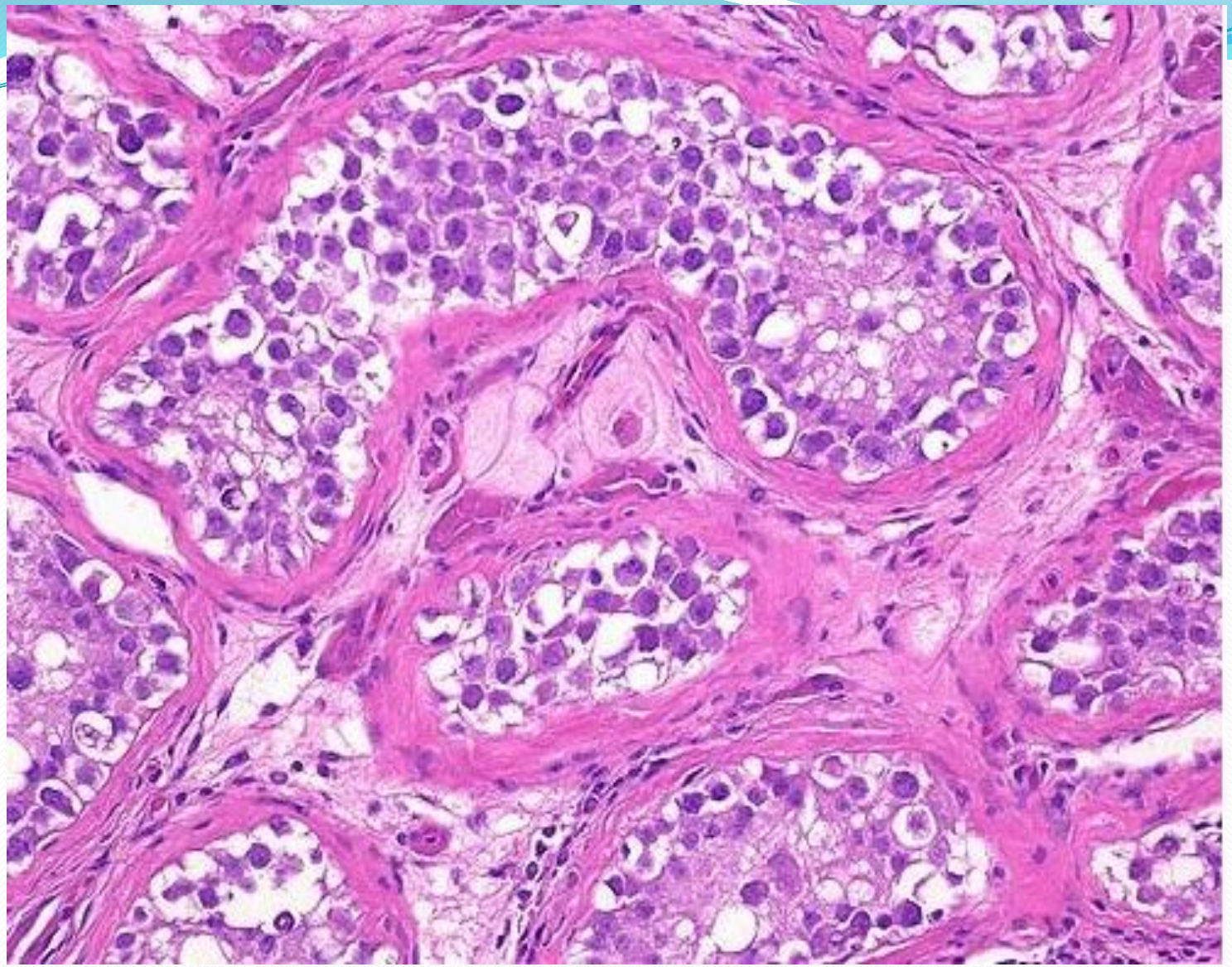
    Teratomas (mature, immature, with malignant transformation)

    Choriocarcinoma

    Mixed

    Polyembryoma

    Diffuse embyoma



Intratubular germ cell neoplasia(ITGCN)

Seminoma.

- Most commonly between the 3rd- 5th decades of life.
- 50% of testicular germ cell neoplasms.
- They are histologically identical to ovarian dysgeminoma & germinoma occurring in CNS.

Gross.

- ***large, soft, well demarcated***, usually homogenous, may contain foci of ***coagulation necrosis***, but usually there is ***no hemorrhage***.

Mic.

- Seminoma are composed of:

- **large cells with distinct cell borders**. And clear, glycogen- rich cytoplasm with round nuclei with conspicuous nucleoli,

-Tumors cells are arranged in lobules with intervening fibrous septa,

- A lymphocytic infiltrate is usually present.

-A granulomatous inflammatory reaction.

-7%- 24% of cases there are syncytiotriphoblast giant cells (secerete hCG).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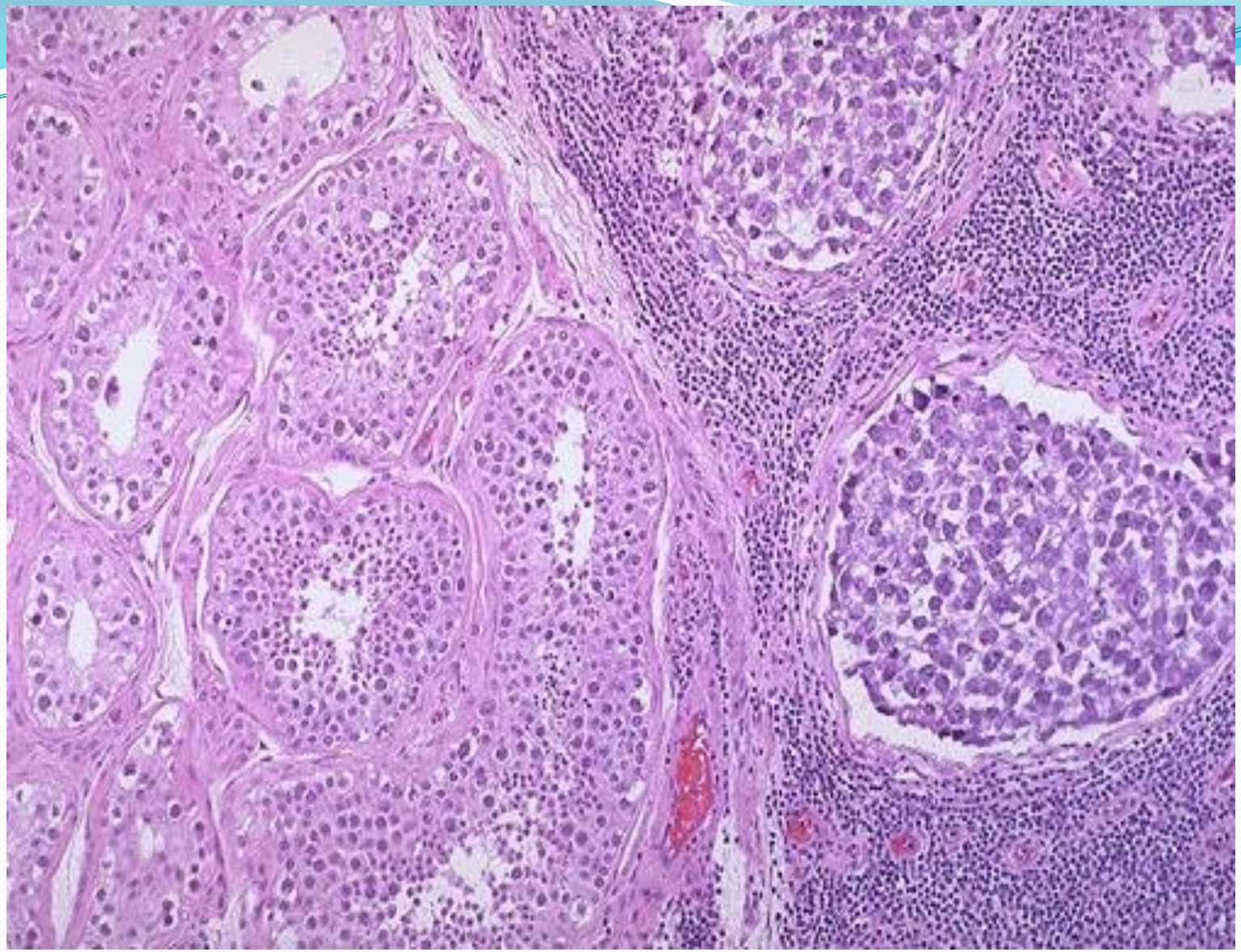
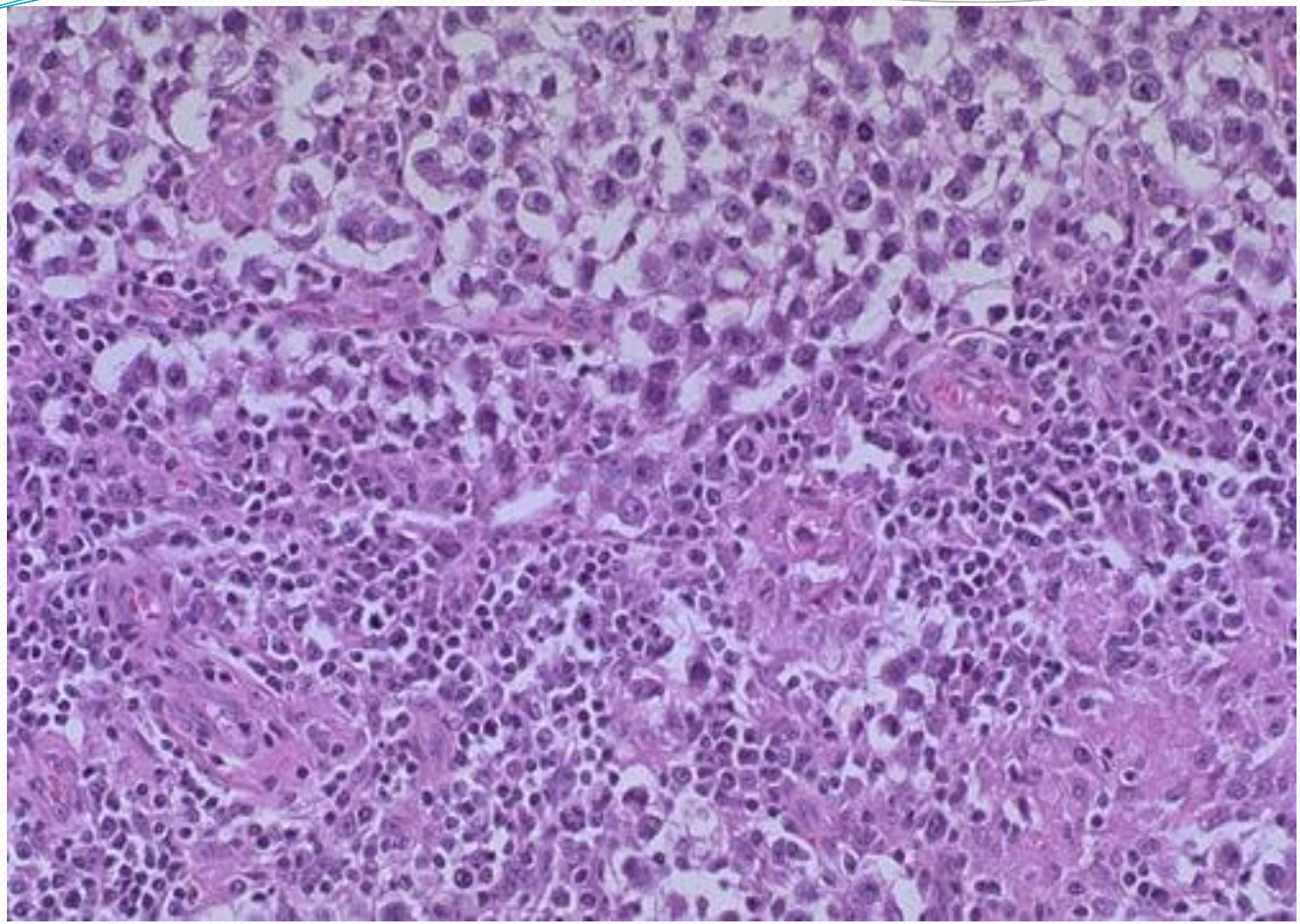




Seminoma never occur in children.

Seminoma is +ve for placental alkaline phosphatase.

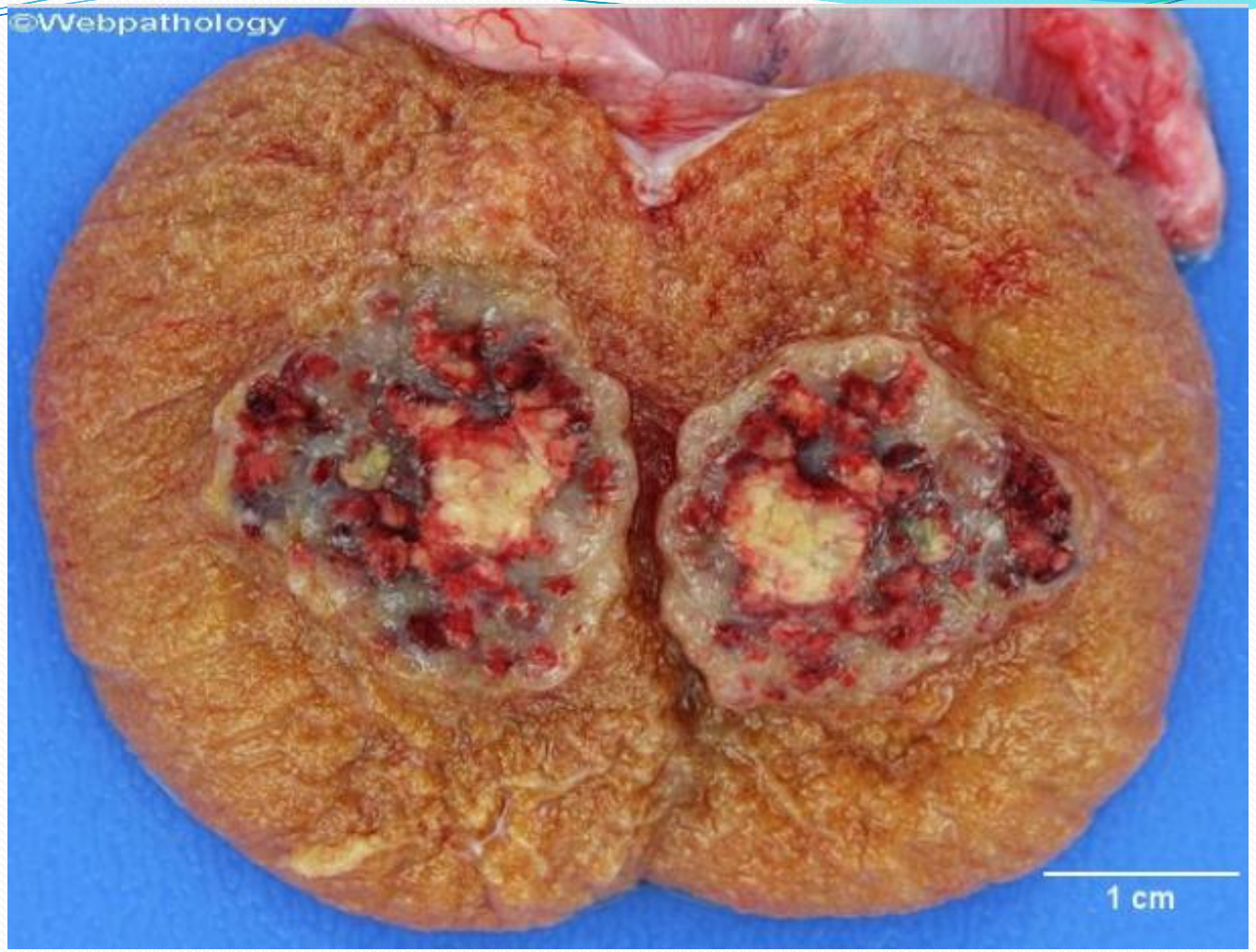
Seminoma is -ve for alpha feto-protein.

Spermatocytic Seminoma.

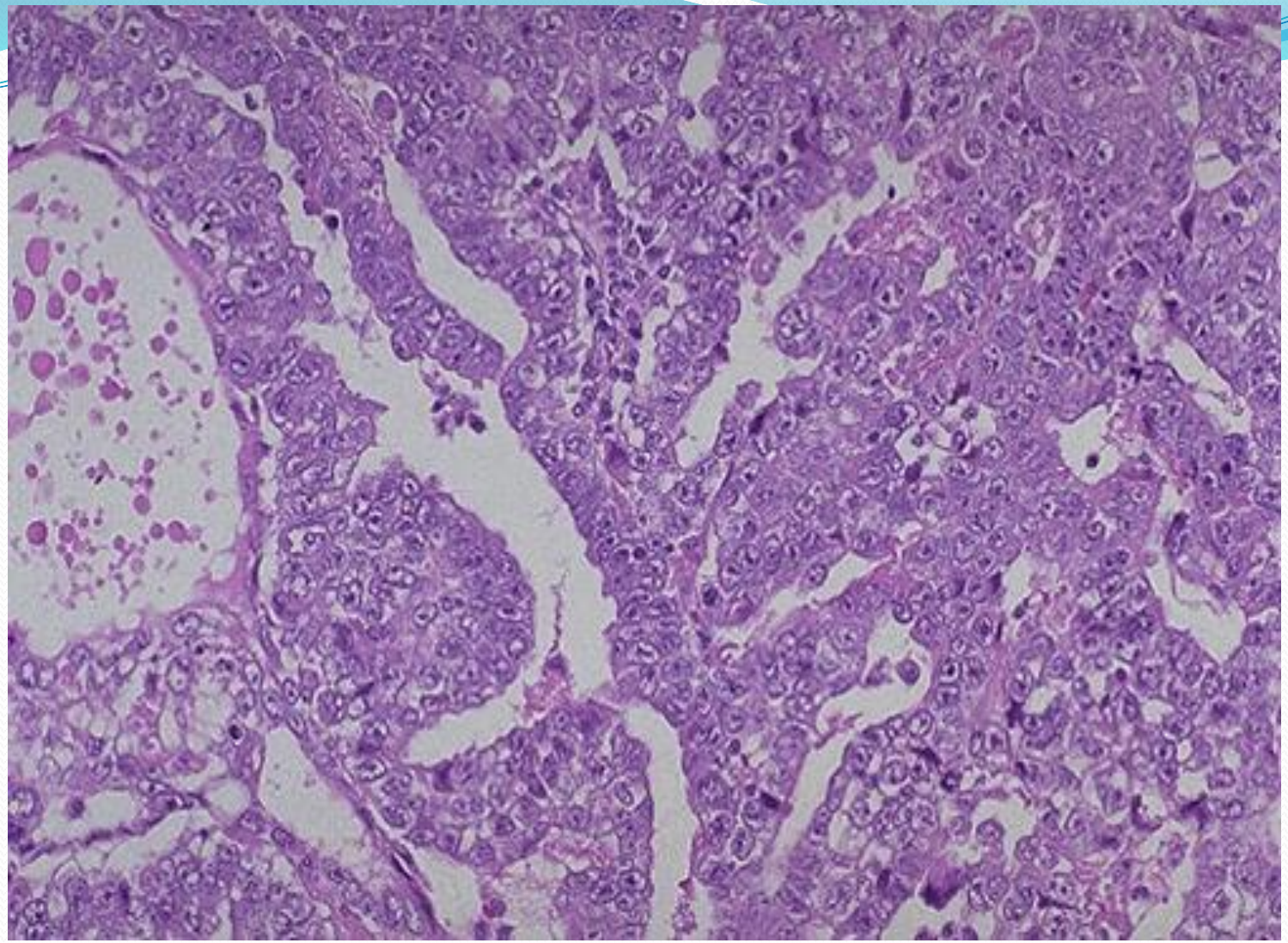
- older patients.
- contain a mixture of medium sized cells, multinucleate tumor cells.
- Metastases are rare in contrast to classic seminoma.

Embryonal carcinoma

- Ill-defined invasive masses containing foci of hemorrhage & necrosis.
- cells are large, indistinct cell borders, & large nuclei with prominent nucleoli



pure embryonal carcinoma in a 34 y/o male. The tumor has a variegated appearance with areas of hemorrhage and necrosis.

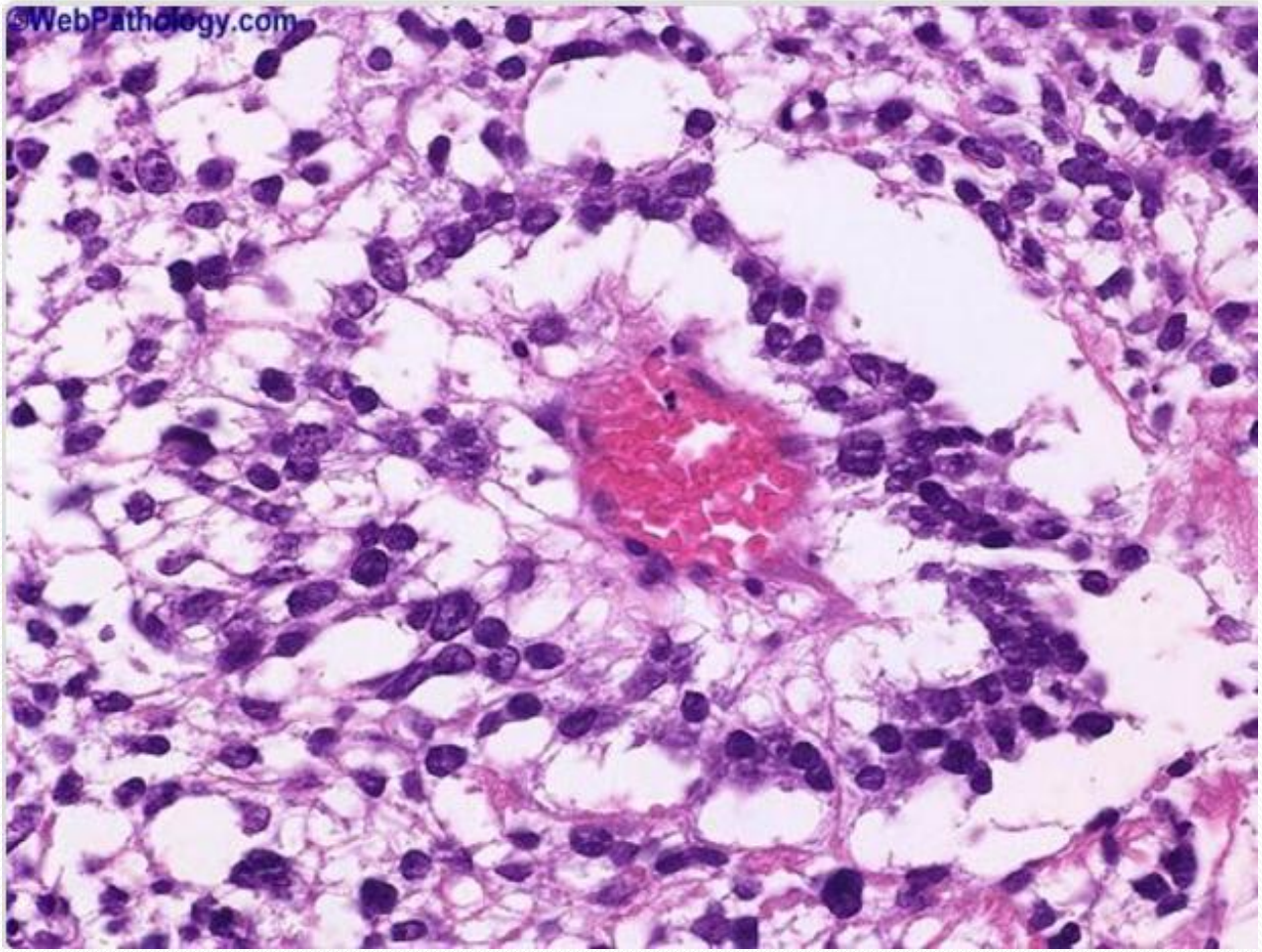


Embryonal carcinoma :sheets of malignant cells trying to form primitive tubules

Yolk sac tumors.

- most common primary testicular neoplasm in children younger than 3 years of age.
- In adults, often seen admixed with embryonal carcinoma.
- Histological examination showing:

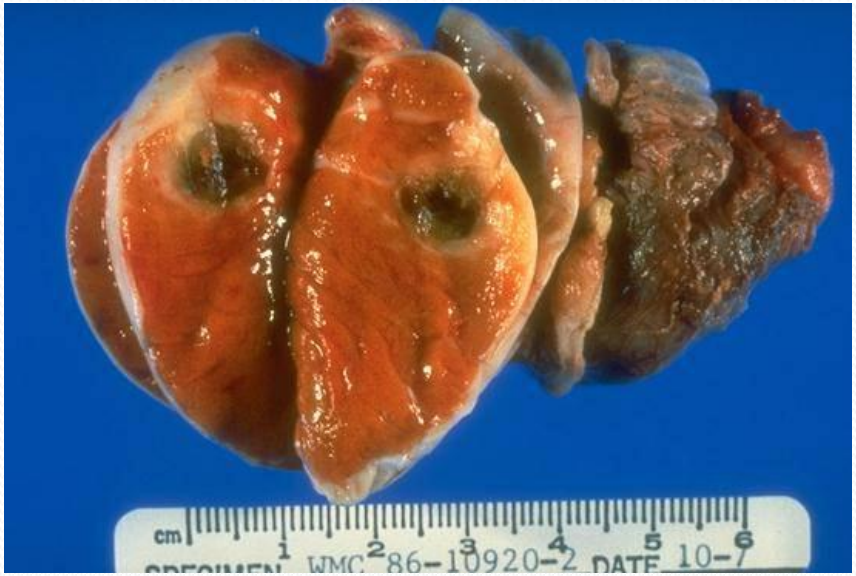
1. low cuboidal to columnar epithelial cells forming sheets, glands, papillae, & microcysts.
2. presence of Schiller-Duvall bodies (primitive glomerulilike structure).



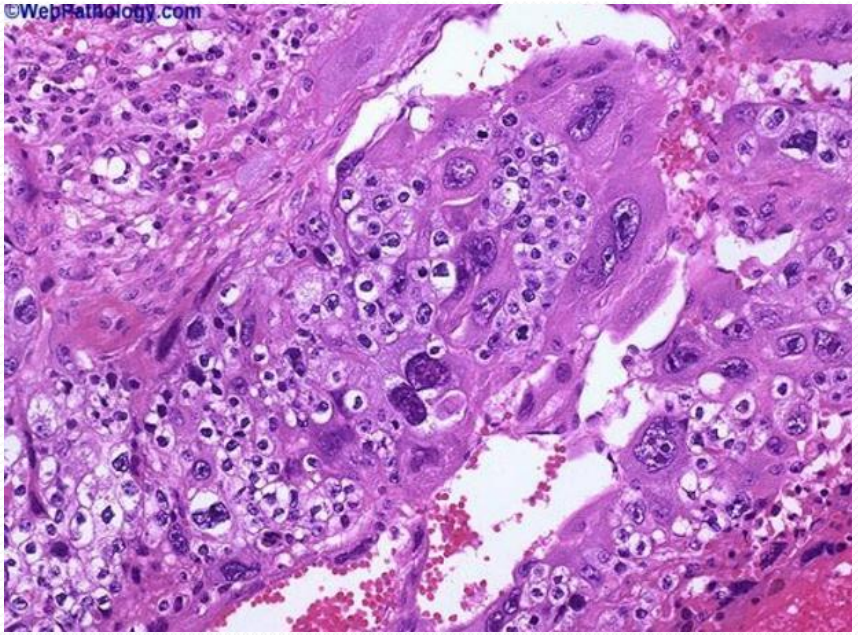
Schiller-Duval body is a distinctive **perivascular structure** seen in some yolk sac tumors. It consists of a central vessel surrounded by tumor cells – the whole structure being contained in a cystic space

Choriocarcinoma.

- These tumors are usually mixed with other germ cell tumors.
- arise in placenta, ovary, mediastinum or abdomen.
- Choriocarcinoma usually small, but almost presented with metastases (mainly to the lungs, liver, CNS).
- Microscopically: sheets of small cuboidal cells (cytotrphoblastic cell) mixed with large, multinucleated syncytial cells(syncytiotrophoblstic cells),



Choriocarcinoma : gross



Choriocarcinoma : cytotrophoblastic cells (small with clear cytoplasim) and syncytiotrophoblastic cells :large multinucleated

Teratomas.

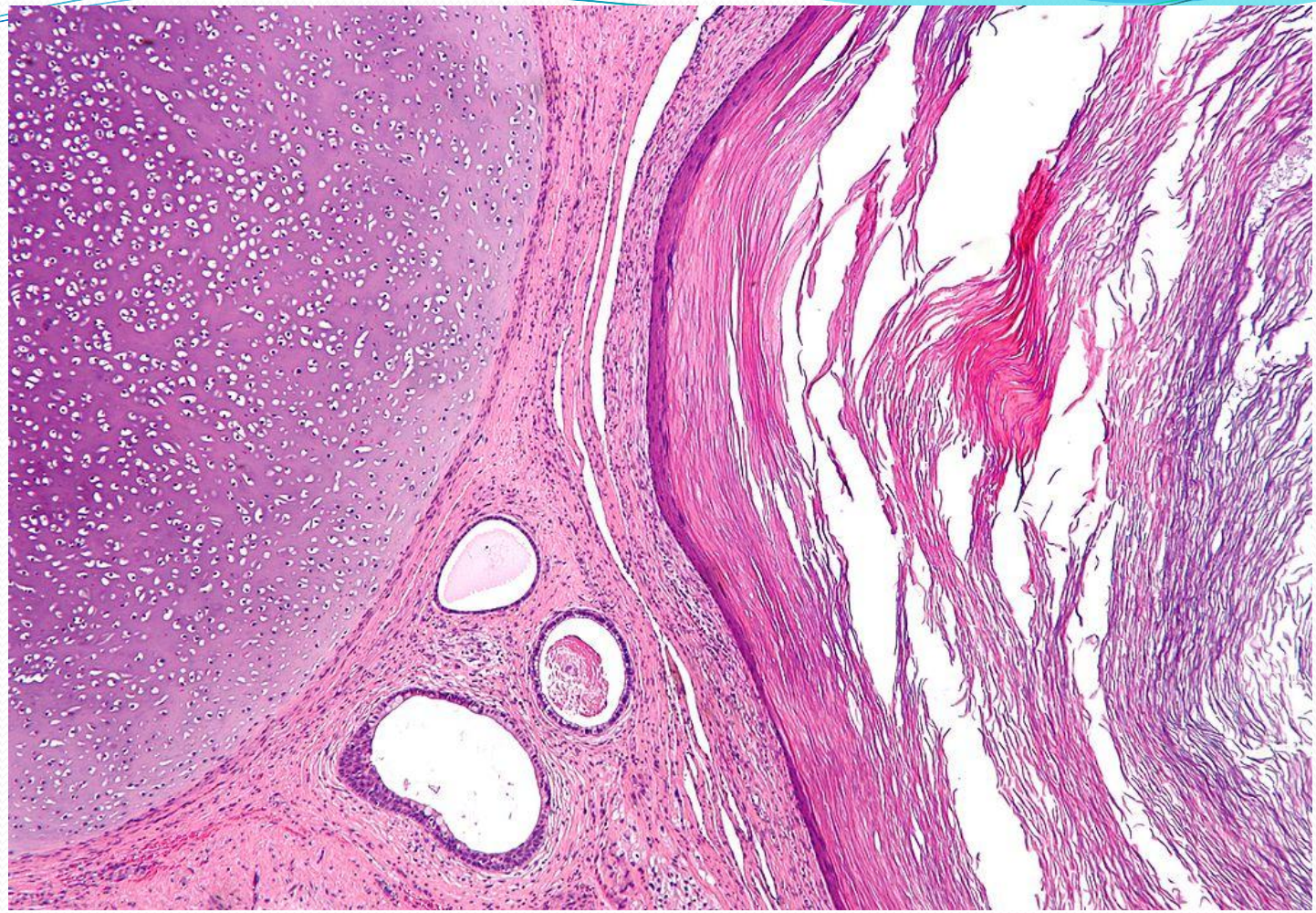
- second most common germ cell tumor in children under 3 years, following the yolk sac tumors.
- They are usually pure, & almost never show metastases, & are associated with Down's syndrome, klinefelter's syndrome, spina bifida…..etc.
- Microscopically, three major variants of pure teratoma are recognized:

I. Mature Teratomas. Contain fully differentiated tissues from one or more germ cell layers (e.g neural tissue, cartilage, adipose tissue, bone, and epithelium).

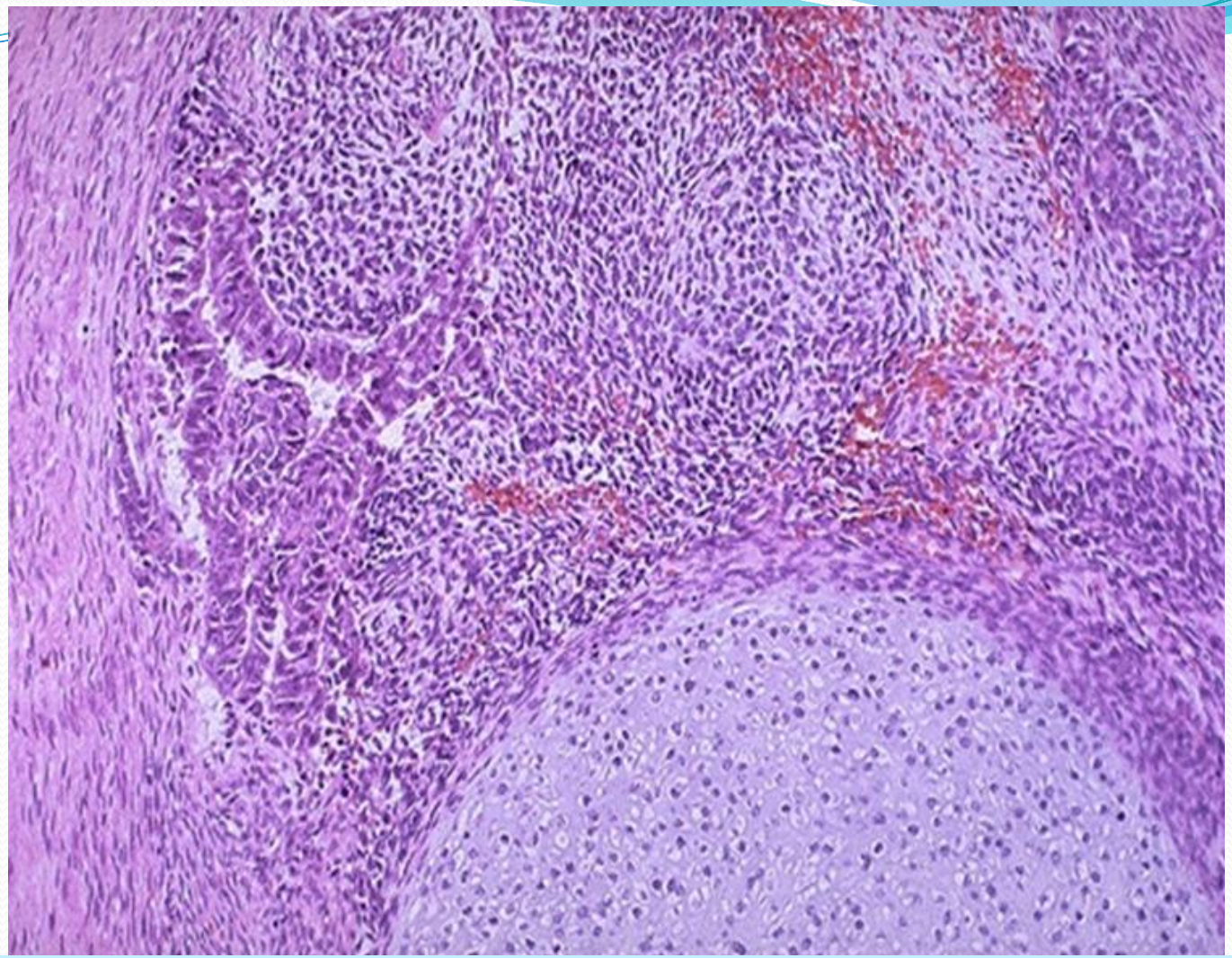
II. Immature Teratomas. Usually are seen in adults, & they are contain immature tissue resemble to fetal tissue (primitive neural tissue, immture cartilage tissue…..etc).

III. **Teratomas with malignant transformation.** Characterized by:

- Presence of malignant growth in teratoma.
- Mainly squamous cell carcinoma, adenocarcinoma.



Teratoma : tissues from all 3 germ layers seen : cartilage (mesoderm) on the left ,gastrointestinal glands (endoderm) centre –bottom and epidermis (ectoderm) on the right



At the bottom is a focus of cartilage. Above this is a primitive mesenchymal stroma and to the left a focus of primitive cells most characteristic for embryonal carcinoma. This is embryonal carcinoma mixed with teratoma.

Thank you