



TESTICULAR & PROSTATIC PATHOLOGY

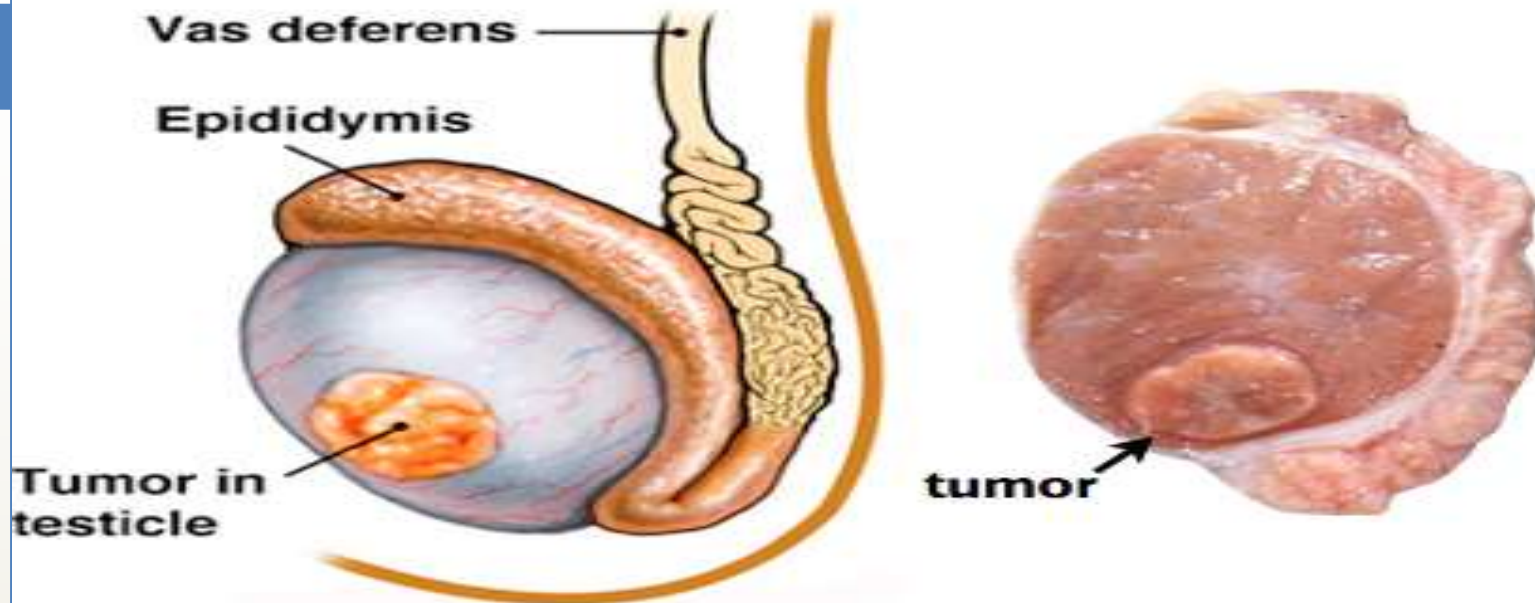
Dr. Nisreen Abu Shahin, M.D.

Professor of Pathology

Department of Pathology

Faculty of Medicine, University of Jordan

Testicular Cancer



- Most common in ages 20–35 years
- Painless, firm, hard, fixed scrotal mass
- Ultrasound

The most common tumors in young men <40 years; causes 10% of cancer deaths

include:

- I. Germ cell tumors : (95%); *all are malignant in postpubertal males*
- II. Sex cord-stromal tumors: (5%); generally benign.

Testicular germ cell tumors are sub-classified into:

I. Seminomas

II. Non-seminomatous germ cell tumors(NSGCT)

- embryonal ca
- yolk sac tumor
- choriocarcinoma
- teratoma

Any testicular germ cell tumor...

• **The histologic appearances may be:**

1. **Pure** (i.e. composed of a single histologic type)

Or ...

2. **Mixed** (with other types in the same tumor)

RISK FACTORS:

1. whites > blacks

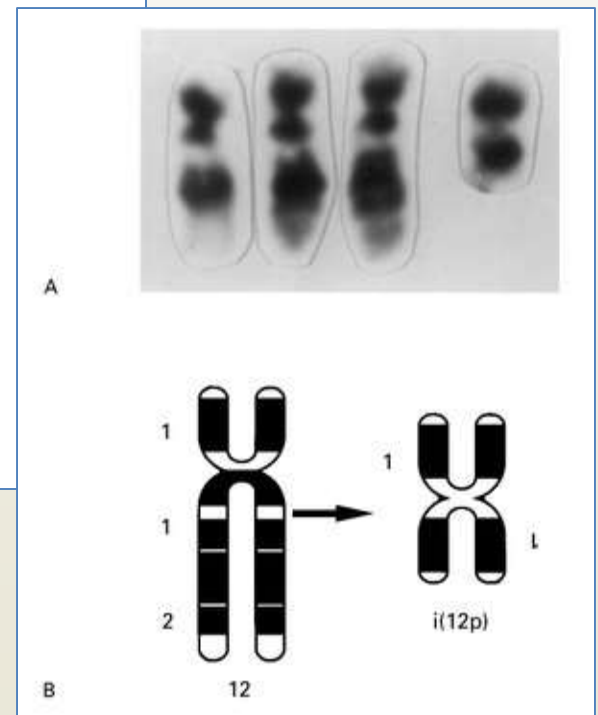
2. **Cryptorchidism** :

(3-5 folds risk of cancer in undescended testis, and an increased risk of cancer in contralateral descended testis).

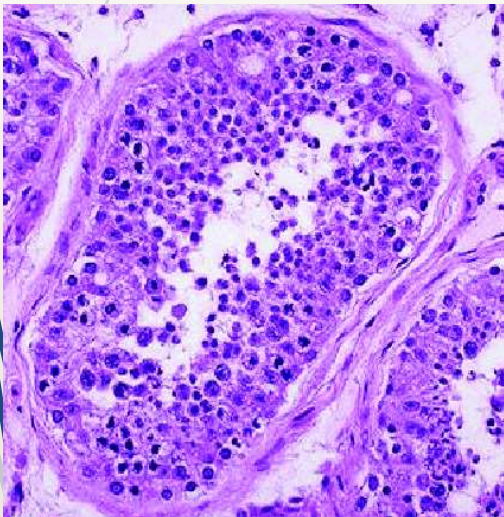
3. **Intersex syndromes**: e.g. Androgen insensitivity syndrome; Gonadal dysgenesis

4. **Family history**: fathers, brothers, and sons of affected patients

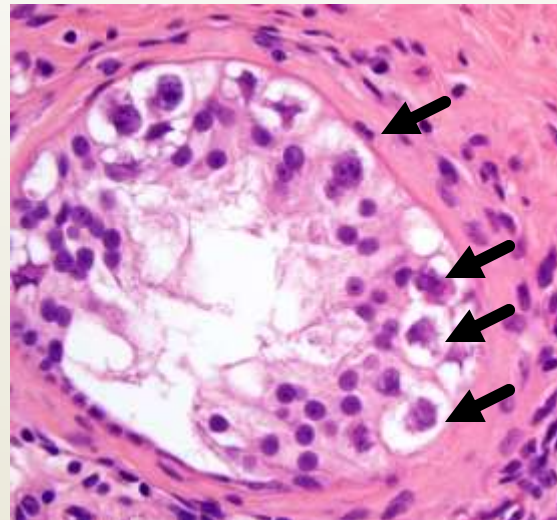
5. The development of cancer in one testis markedly increase risk of neoplasia in the **contralateral** testis.
6. An **isochromosome of the short arm of chromosome 12, i(12p)**, is found in virtually all **postpubertal** germ cell tumors, regardless of their histologic type.



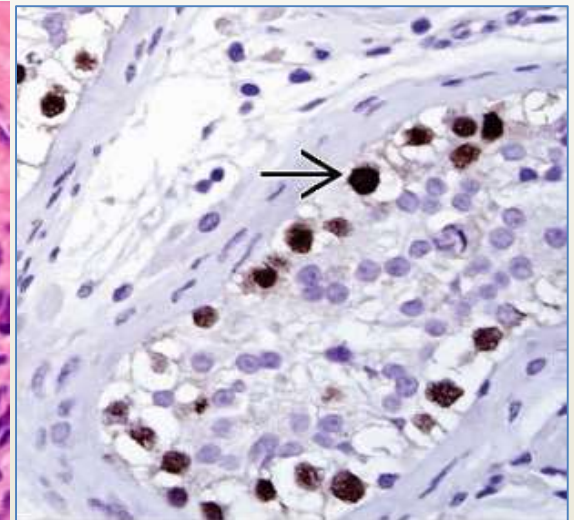
- 7. Most testicular tumors in post-pubertal males arise from the in situ lesion “*intratubular germ cell neoplasia*”, currently called *germ cell neoplasm in situ (GCNIS)*



Normal



germ cell neoplasia in situ (GCNIS)



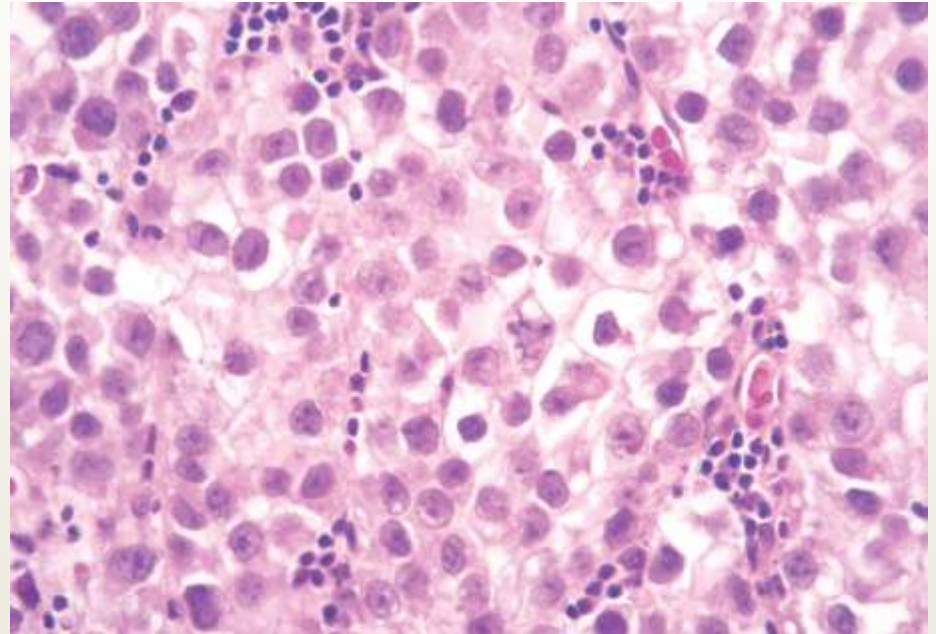
I. Seminoma:

- **Make up to 50% of all testicular tumors**
- ***Classic seminoma:***
 - Rare in pre-pubertal children
 - Progressive painless enlargement of the testis
 - Histologically identical to ovarian dysgerminomas and to germinomas occurring in the CNS and other extragonadal sites.

1. Seminoma

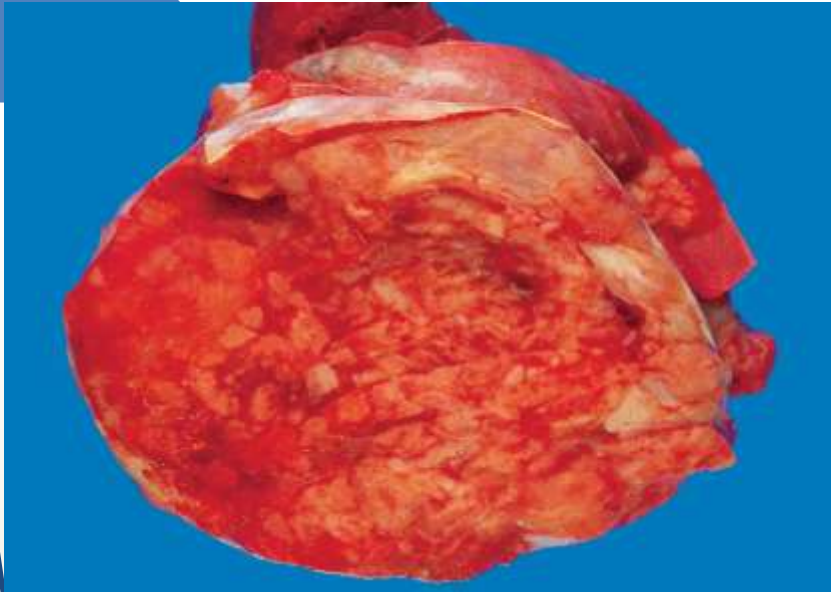


Seminoma :circumscribed, pale, fleshy, homogeneous mass; usually without hemorrhage or necrosis.

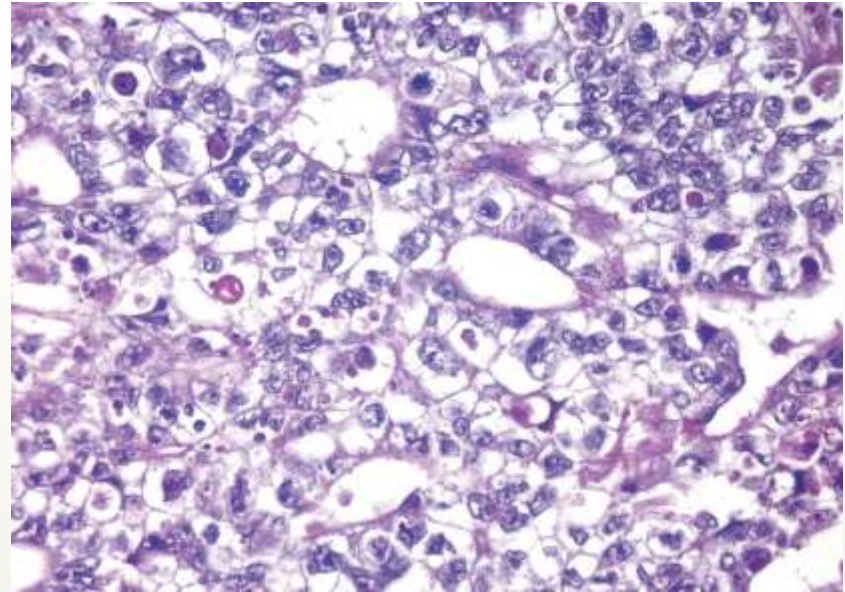


Microscopic examination reveals large cells with distinct cell borders, pale nuclei, prominent nucleoli, and lymphocytic infiltrate.

2. Embryonal carcinoma



ill-defined masses containing foci of **hemorrhage** and **necrosis**



Sheets of undifferentiated cells & primitive gland-like structures. The nuclei are large and hyperchromatic with prominent nucleoli, and increased mitotic activity

- **20-30 years old**
- **More aggressive than seminoma**

3. Yolk sac tumors

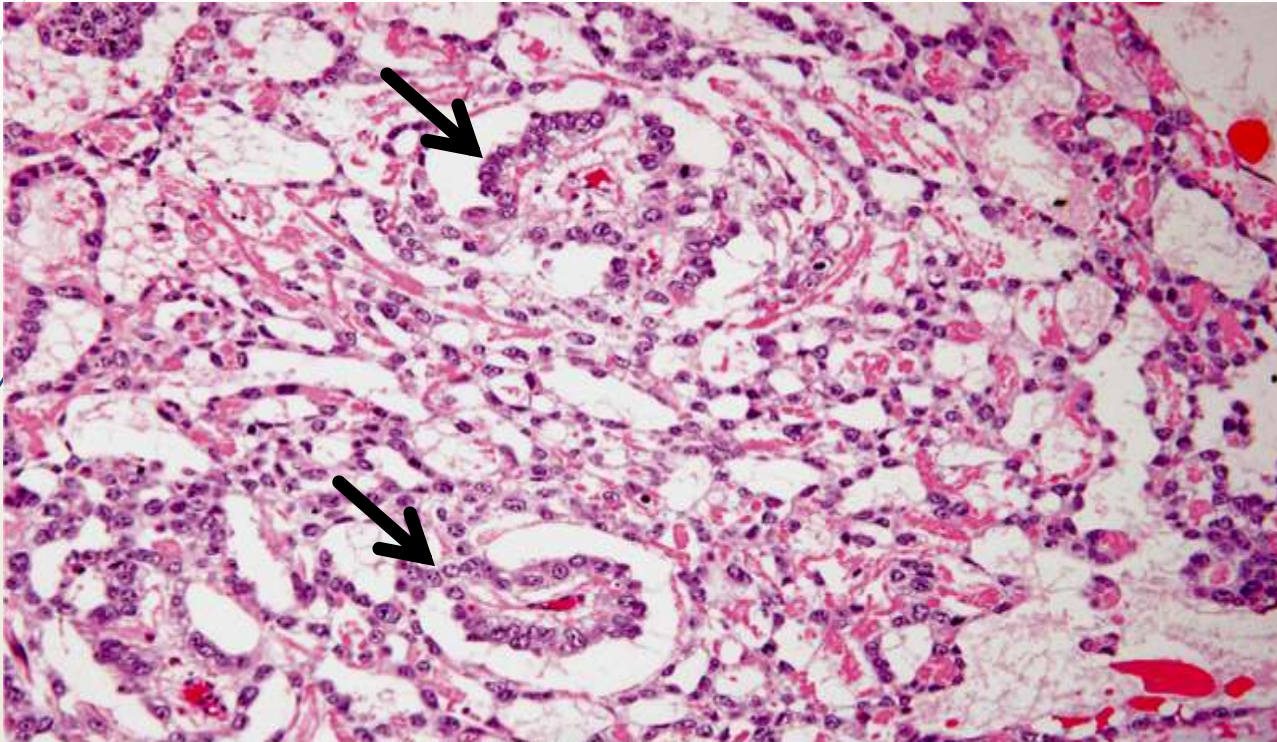
- The most common primary testicular neoplasm in **children** <3 year
- good prognosis in young children
- In adults, pure form of yolk sac tumors is rare and have a worse prognosis

Yolk sac tumors

➔ Histologically:

- The tumor is composed of low cuboidal to columnar epithelial cells forming Microcysts, Lacelike (reticular) patterns.
- A distinctive feature is the presence of structures resembling primitive glomeruli, called Schiller-Duval bodies.
- Alpha-feto-protein (**AFP**) usually detected in serum.

3. Yolk sac tumor (arrows: Schiller-Duval bodies)



Kumar et al: Robbins Basic Pathology, 9e.
Copyright © 2013 by Saunders, an imprint of Elsevier Inc.

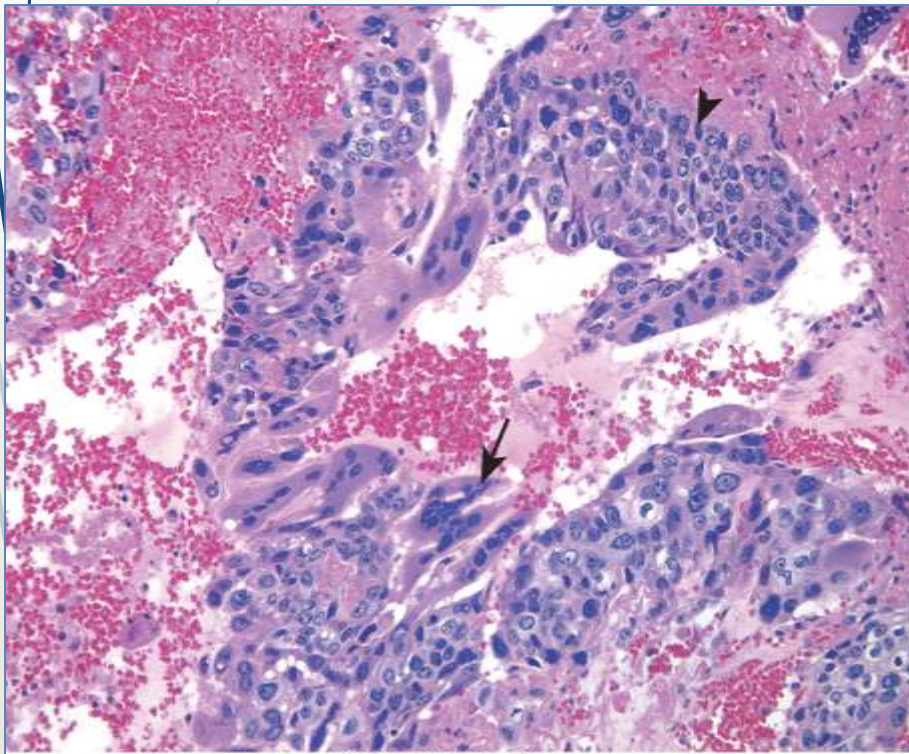
4. Choriocarcinoma

- highly malignant form of testicular tumor.
- its “pure” form is rare, constituting less than 1% of all germ cell tumors;
- usually mixed with other germ cell tumors
- Characterized: Elevated serum level of **HCG**.

Choriocarcinoma

Arrow: Syncytiotrophoblast

Arrow head: Cytotrophoblast



Kumar et al: Robbins Basic Pathology, 9e.
Copyright © 2013 by Saunders, an imprint of Elsevier Inc.

Macroscopically:

- The primary tumors may be small, even in patients with extensive metastatic disease.
- necrosis and hemorrhage are extremely common

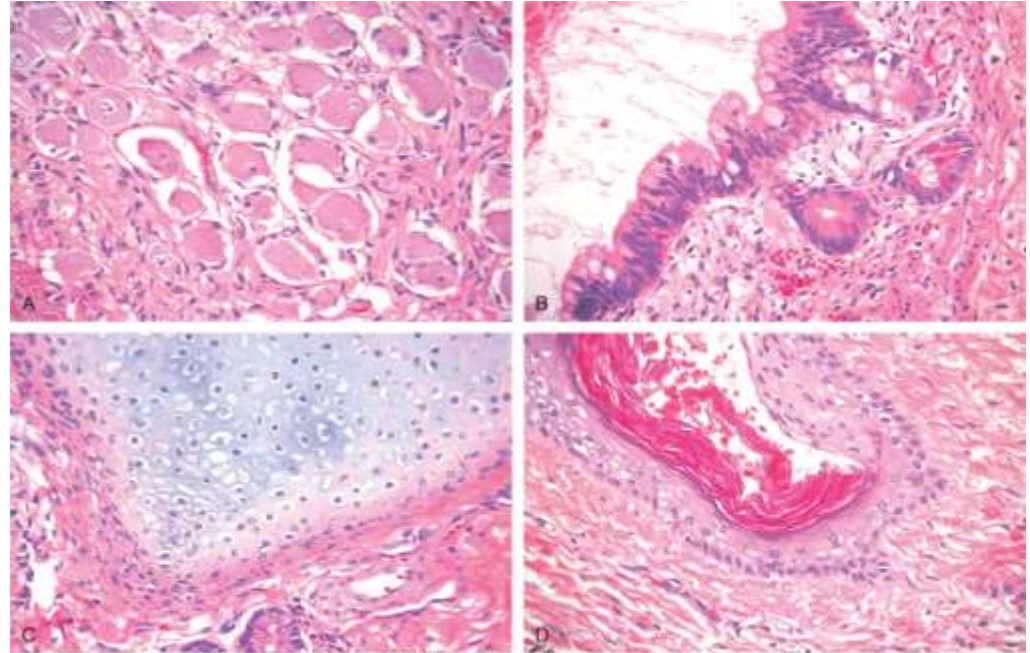
Microscopic examination:

- **Syncytiotrophoblasts:** large multinucleated cells with abundant eosinophilic vacuolated cytoplasm producing **HCG**.
- **Cytotrophoblasts:** polygonal cells with distinct borders and clear cytoplasm; grow in cords or masses and have a single, fairly uniform nucleus.

5. Teratoma

- ▶ The neoplastic germ cells differentiate along somatic cell lines showing various cellular or organoid components
- ▶ Resonant of the normal derivatives of more than one germ layer.
- ▶ May affect all ages
- ▶ In children,
 - Pure forms of teratoma are common, being second in frequency to yolk sac tumors
- ▶ In adults,
 - pure teratomas are rare (3% of germ cell tumors).
 - frequency of teratoma mixed with other germ cell tumors is high.

5. Teratoma



Kumar et al: Robbins Basic Pathology, 9e.
Copyright © 2013, by Saunders, an imprint of Elsevier Inc.

- **Grossly:**

firm masses and cysts with hair, cartilage, bone, and even teeth!


- **Histologically:**

1. **Mature teratomas:**

a heterogeneous collection of differentiated cells, such as neural tissue, muscle bundles, islands of cartilage, clusters of squamous epithelium, etc.

2. **Immature teratomas:**

- Contain fetal primitive tissues

- 
- **In prepubertal males**, mature teratomas usually follow a benign course.
 - **In postpubertal males**, all teratomas are regarded as potentially malignant, being capable of metastasis regardless of whether they are composed of mature or immature elements.

Clinical Features of testicular germ cell neoplasms:

- present most frequently with a **painless testicular mass** that is non-translucent
- Some tumors, especially NSGCT, may have metastasized widely by the time of diagnosis
- Biopsy of a testicular neoplasm is **contraindicated**, because it's associated with a risk of tumor spillage
- The standard management of a solid testicular mass is **radical orchiectomy**, based on the presumption of malignancy.



Seminomas and nonseminomatous tumors differ in their behavior and clinical course:

I. Seminomas:

- ▶ often remain **confined** to the **testis** for long periods
- ▶ If metastasize, most commonly in iliac and paraaortic lymph nodes
- ▶ Hematogenous metastases occur **late** in the course of the disease.

II. Nonseminomatous germ cell neoplasms:

- ▶ tend to metastasize earlier, by lymphatic & hematogenous (**liver and lung** mainly) routes.
- ▶ Metastatic lesions may be identical to the primary testicular tumor or different containing elements of other germ cell tumors

Serum Assay of tumor markers secreted by germ cell tumors:

- ▶ helpful in diagnosis and follow up (to detect recurrence and response to therapy)
 - ✓ **HCG** : elevated in patients with **choriocarcinoma**
 - ✓ **AFP** : elevated in patients with **yolk sac tumor**
 - ✓ **lactate dehydrogenase (LDH)**:correlate with the **tumor burden** (tumor size and load); regardless of histologic type

TREATMENT:

➤ Seminoma:

- **Surgery; radiotherapy (highly radiosensitive)**

- **best prognosis.**

- **>95% of patients with early-stage disease can be cured.**

➤ Nonseminomatous germ cell tumors:

- **90% of patients achieve complete remission with aggressive chemotherapy, and most are cured.**

- **The exception is choriocarcinoma, which is associated with a poorer prognosis.**

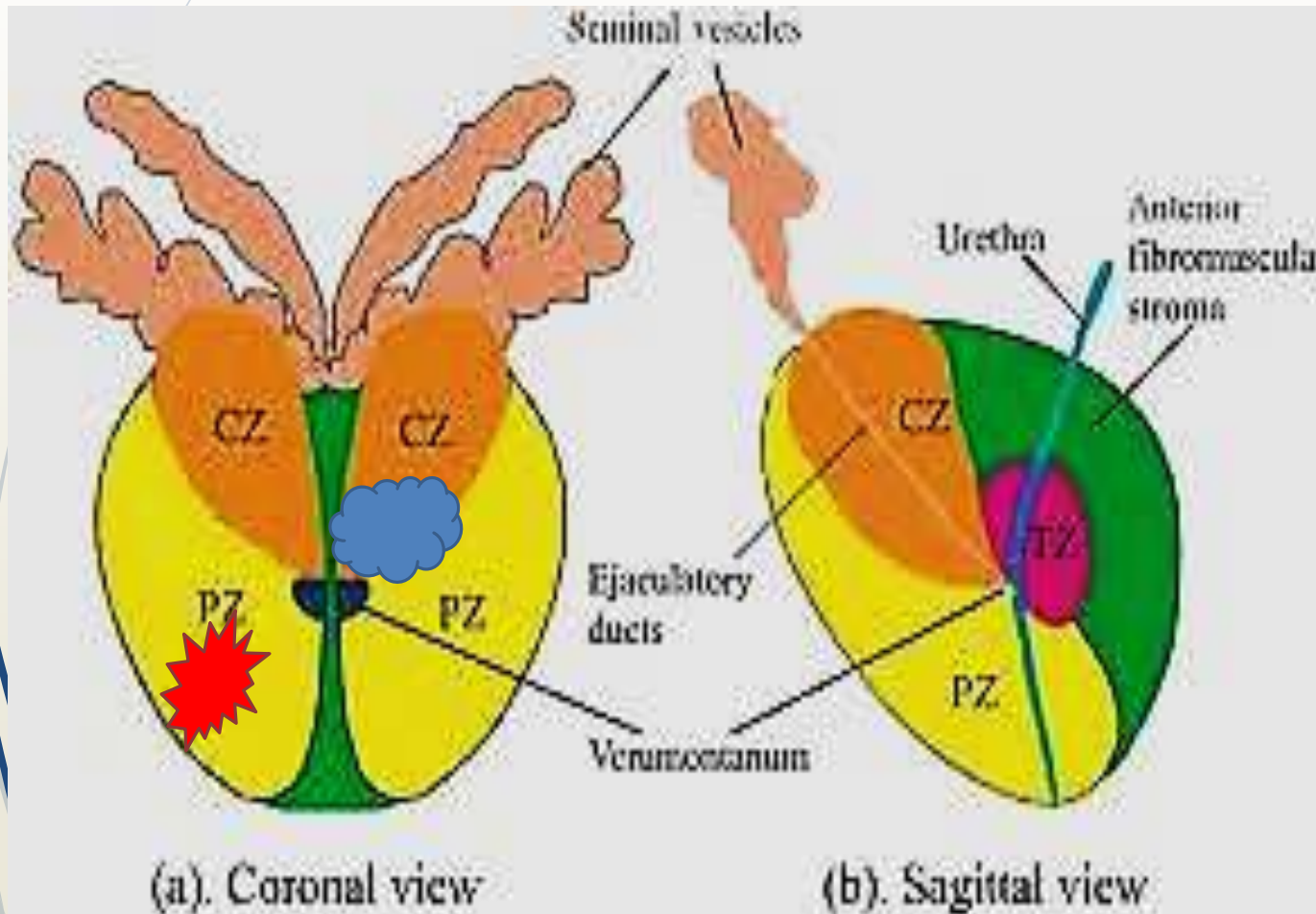
Prostate gland pathology

- 
- 1- Benign Prostatic Hyperplasia (BPH)
 - 2- Carcinoma of the Prostate

PROSTATE GLAND- ZONES

BPH

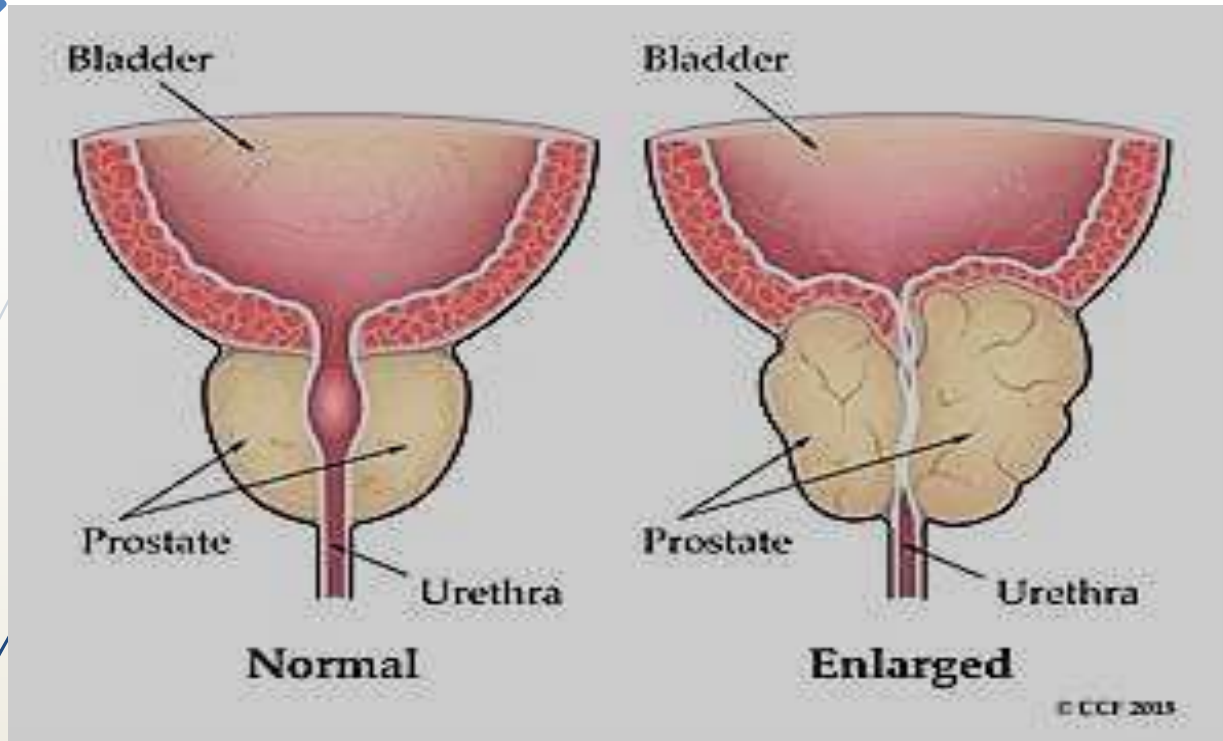
cancer



Benign Prostatic Hyperplasia

- ▶ extremely common cause of prostatic enlargement in men ≥ 40 ; frequency rises with age.
- ▶ **androgen-dependent** proliferation of both stromal and epithelial elements
- ▶ does **not** occur in males with genetic diseases that block androgen activity.
- ▶ **Pathogenesis:**
- ▶ Dihydrotestosterone (DHT) is synthesized in prostate from circulating testosterone by enzyme **5 α -reductase**.
- ▶ DHT support growth and survival of prostatic epithelium and stroma by binding to **androgen receptors**
- ▶ **DHT is 10 times more potent** than T

Benign prostatic hyperplasia

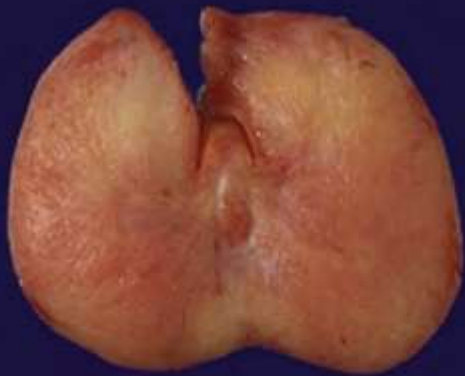


- BPH always occurs in the **inner transition zone of the prostate.**

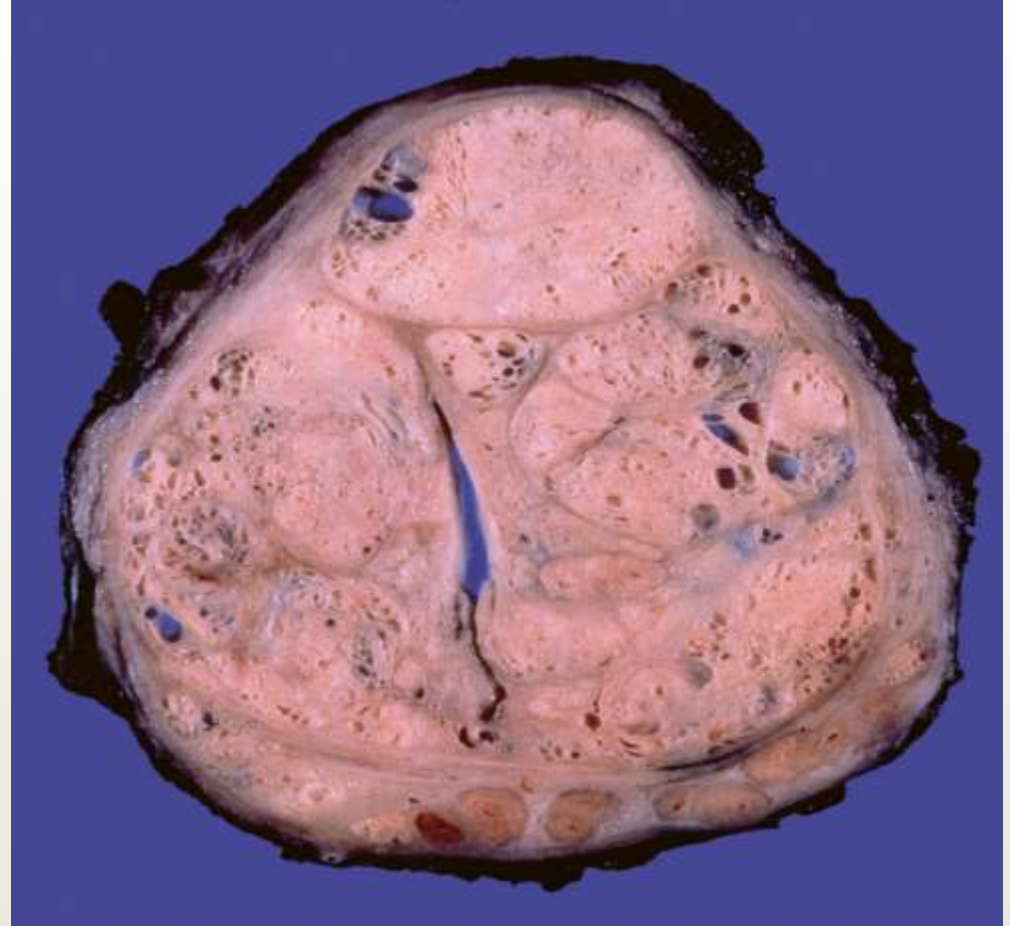
Grossly:

- Prostatic enlargement (60 -100 g versus 30 g in normal)
- many well circumscribed nodules bulging from the cut surface
- Compressed urethra

Macroscopically: enlarged gland with many well-defined nodules



Normal

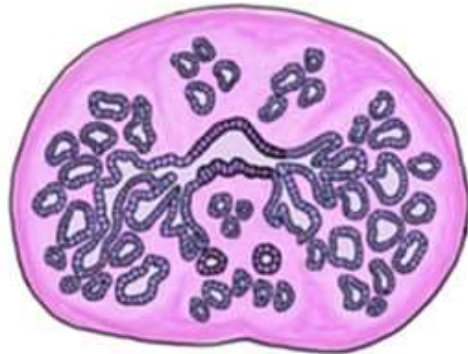


BPH

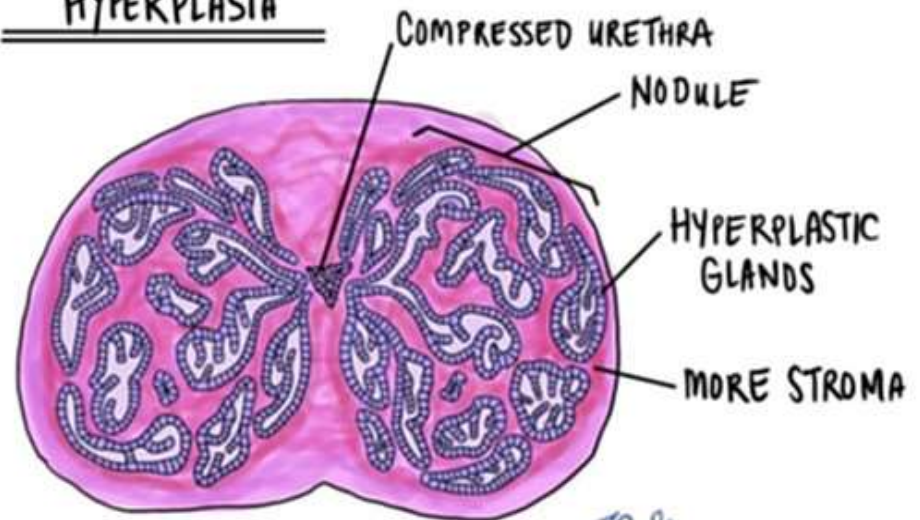
➤ Microscopically:

- hyperplastic nodules composed of proliferating glands and stroma.
- The hyperplastic glands are lined by tall, columnar epithelial cells and a peripheral layer of flattened basal cells.

NORMAL PROSTATE



BENIGN PROSTATIC
HYPERPLASIA



BPH- Clinical features:

Because BPH involves the **inner portions of the prostate**, the most common manifestations are :

- ▶ **lower urinary tract obstruction**

 - difficulty in starting stream of urine (hesitancy)

 - intermittent interruption of urinary stream

 - urinary urgency, frequency, and nocturia (bladder irritation)

- ▶ **↑ risk of urinary tract infections**

- ▶ **TREATMENT:**

- ▶ **Drugs:**

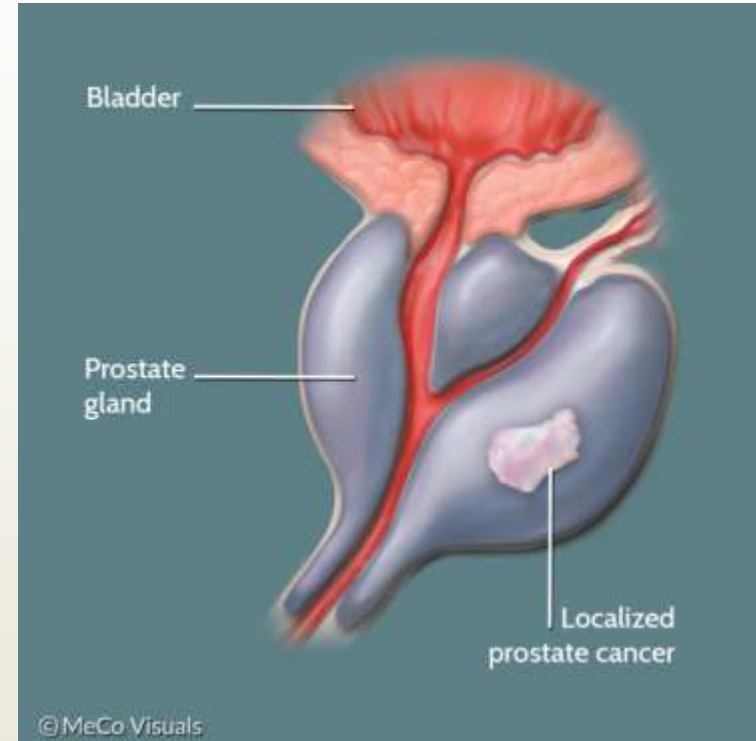
- 1- 5-alpha reductase inhibitors

- 2- agents that block α 1-adrenergic receptors (relax prostatic smooth muscle)

- ▶ **+/- Surgery**

Carcinoma of the Prostate

- >50 years of age
- **The most common form of cancer in men > 40 yr**
- significant drop in prostate cancer mortality, due to increased early detection of the disease through screening



PATHOGENESIS

1. Androgens.

- Cancer of prostate does not develop in males castrated before puberty.
- Cancers regress in response to surgical or chemical castration

2. Heredity:

↑risk first-degree relatives of patients with prostate cancer.

3. Environment:

- Geographical variations; diet. e.g. rise of incidence in Japanese immigrants to US

4. Acquired somatic mutations

- ***TMPRSS2-ETS* fusion genes**: most common gene rearrangements in prostate cancer (fusion genes of androgen regulated promoter *TMPRSS2* gene and *ETS* family transcription factors).

Clinical Features

- palpable as irregular hard nodules on digital rectal examination.
- **Screening test:** digital rectal examination + elevated serum prostate-specific antigen (PSA) level
- **Metastasis: Osteoblastic** (bone-producing) bone metastases in axial skeleton on bone scans
- **Prognosis:** if diagnosed early with no metastasis, 5-yr survival is excellent

Prostate
cancer = 

