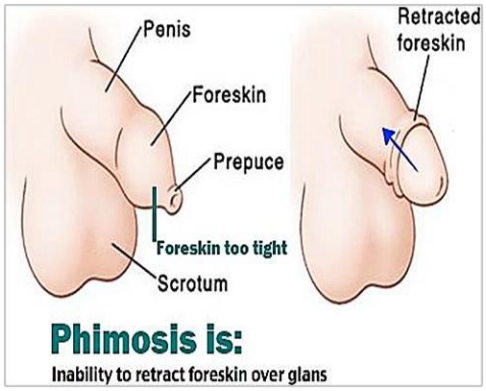
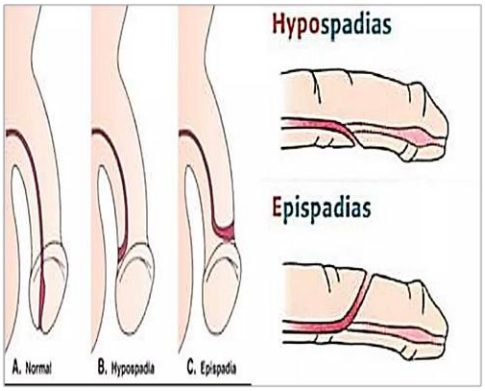
Pathology of male genital system

1- Congenital anomalies

	Phimosis	Hypospadias and epispadias
Definition	It is narrowing the opening of the prepuce	**Hypospadias:** the urethra opens at ventral surface of the penis. **Epispadias:** the urethra opens at dorsal surface of the penis
Complications	1. **Balanitis:** Inflammation of glans penis. 2. **Squamous cell carcinoma** of the penis (Due to accumulation of smegma that predispose to both infection and carcinoma). 3. **Gradual urinary tract obstruction**	1. **Urinary obstruction** (as the urethral opening is often constricted). 2. **Sterility** (when the orifice is near the base of the penis).
Figure		

Cryptorchidism (undescended testis)

I Def & Incidence

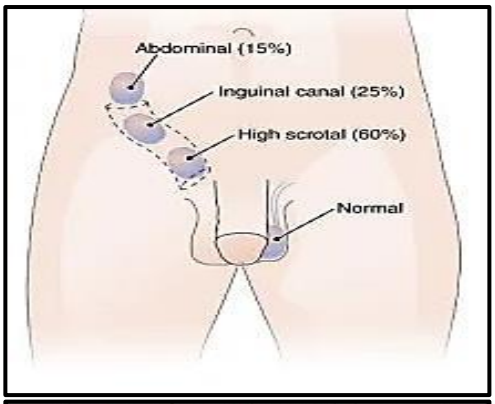
- **Failure of descent** of one or both testis into the scrotum. The testis is found in the abdomen, pelvis, or in the inguinal canal
- **Most common** congenital abnormality of the genitourinary tract

II Causes

1. Hormonal disturbances: Deficiency of gonadotrophic hormone of pituitary

2. Obstruction of the pathway: Organic obstruction prevents the descent.

3. Other defects: Short spermatic vessels or vas deferens or mal development of the scrotum or cremaster muscle

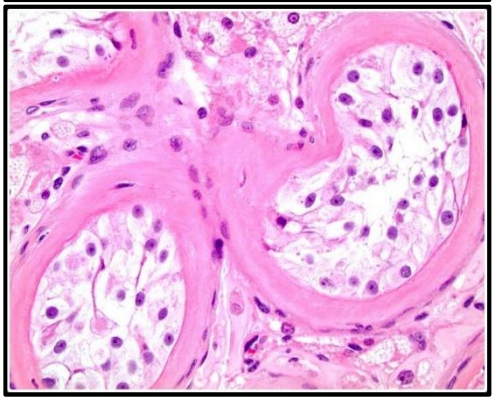


III Complications

- Infertility (in bilateral cases).
- Malignancy (precancerous for seminoma).

IV M/E

- Atrophy of seminiferous tubules with fibrosis.
- Germ cell neoplasia in situ which is likely a precursor of subsequent germ cell tumors



2- Inflammatory diseases

	Prostatitis	Seminal vesiculitis
Definition	Inflammation of the prostate	Inflammation of seminal vesicles
Causes	**1. Organisms:** E-coli, gonorrhea, staph. aureus, strept pyogenes…etc. **2. Routes of infection:** • **Direct spread** from cystitis, urethritis, urethral instrumentation. • **Blood borne** infection	It may be 2ry to prostatitis or blood borne
Pathology	**1. Acute** suppurative prostatitis which may form abscess. **2. Chronic** nonspecific prostatitis follows acute.	---

	Funiculitis	Orchitis
Definition	Inflammation of spermatic cord	Inflammation of testis
Causes	**1. Direct spread** from epididymis. **2. Lymphatic spread** from seminal vesicles. **3. Blood spread**.	**1. Bacterial orchitis:** **Spread of infection from:** a) Epididymis directly b) Spermatic cord by lymphatic or through vas deferens c) Blood borne **2. Viral:** mumps orchitis **3. Traumatic** orchitis **4. Autoimmune** orchitis
Effect	It leads to diffuse thickening of spermatic cord	---
Pathology	---	Acute inflammation with suppuration resulting in scarring and sterility

Chronic specific inflammation

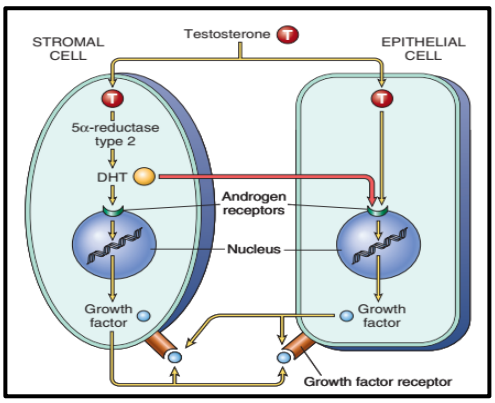
- Tuberculosis.
- Syphilis.
- Filariasis
- Bilharziasis.

4- Benign (senile) prostatic hyperplasia

I Incidence

- **Extremely common**.
- ≈50% of men at 50 Years are affected,
- ≈95% are affected above 70 Years.
- Gradual onset with slow progression

II Pathogenesis

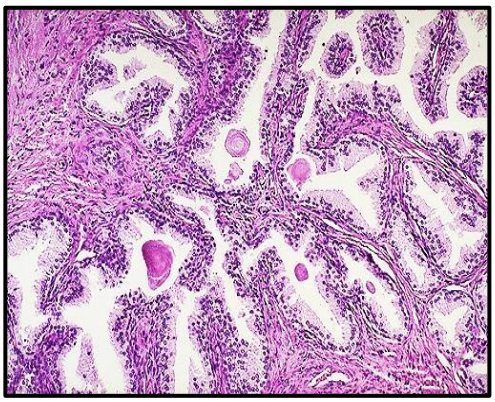


- **Hormonal changes** with increase in 5 α- reductase enzyme in prostate that convert testosterone to dihydroxy-testosterone (DHT)
- **Accumulation of DHT** (10 times more potent than androgens in combining to the androgen receptor and dissociate more slowly).
- **Increasing the proliferation** of epithelial & stromal cells and decreasing epithelial **cells apoptosis**

III N/E

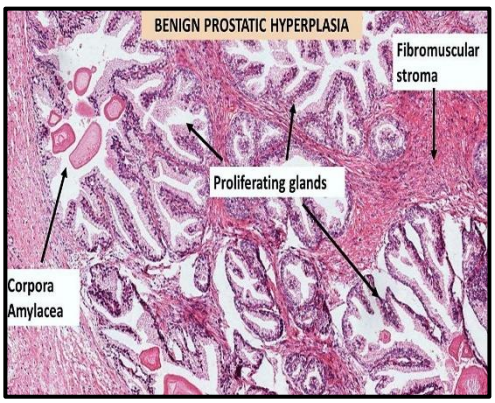
- **Size:** The gland is enlarged nodular,
- **C/S:** May show cystic change.
- **Consistency:** Firm, rubbery

IV M/E



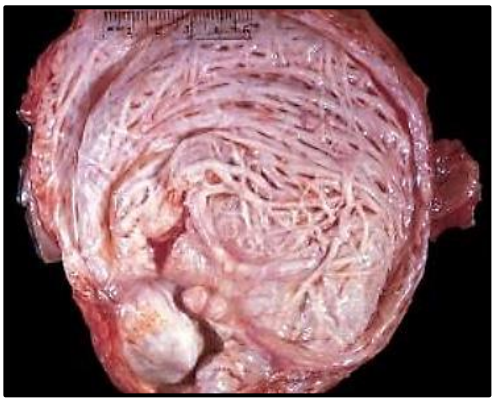
- **Hyperplasia of the acini** which are larger than normal, variable in size and shape and lined by tall epithelium with frequent papillary projections.
- The acini may contain numerous **corpora amylacea**.
- **Hyperplasia of the fibromuscular stroma** with lymphocytes & plasma cells

V Clinical picture



Obstructive symptoms (Prostatism) due to compression on prostatic urethra and internal urethral meatus (interferes with the sphincter mechanism)

VI Complications



- **Gradual urinary tract obstruction:**
  - **Urethra:** compressed as a slit.
  - **Urinary bladder:** trabeculations, diverticulations, cystitis, stones.
  - **Ureter:** bilateral hydroureter, pyoureter.
  - **Kidney:** bilateral hydronephrosis, pyonephrosis.
  - **Chronic renal failure**.
- **Prostatism:**
  Hesitancy Straining to void, Interrupted flow, Incomplete emptying, Terminal dribbling
- **No relation to malignancy**

5- Prostatic Carcinoma

I Incidence

The **most common malignant tumor** in males >50 years.

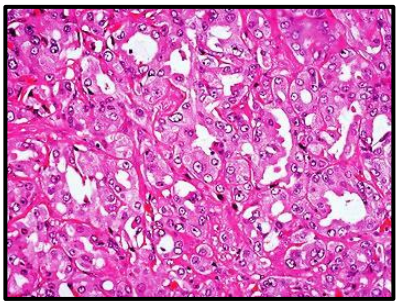
II Predisposing factors

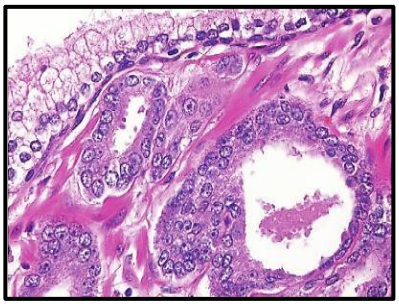
- **Racial factors:** More common in African
- **Endocrinologic factors:** Androgens (so, Orchiectomy reduce the tumor size in Prostatic carcinoma patient).
- **Environmental factors:** high fat diet, exposure to polycyclic aromatic hydrocarbons
- **Genetic basis:** familial cases (Chromosome No 1 and 10).

III N/E

- Multifocal **palpable** Mass in rectal exam
- **Site:** Peripheral zone of the posterior lobe
- **Capsule:** Uncapsulated
- **Consistency:** gritty and firm

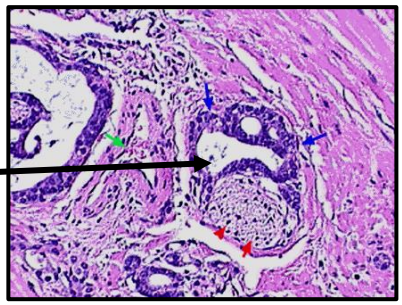
IV M/E





- **Adenocarcinoma,** malignant glands are lined cells having prominent nucleoli.
- Tumor cells produce mucin and **acid phosphatase**
- **Gleason Score:** is the system to grade the tumor based on the degree of differentiation among the cells

V Spread

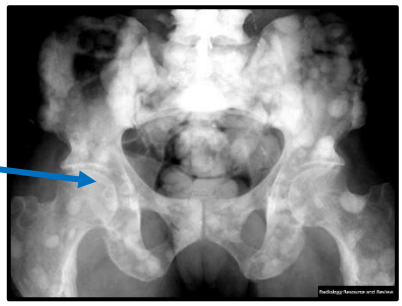


•**Local spread:** to prostatic urethra, seminal vesicles, floor of urinary bladder and rectum

•**Lymphatic spread:** To para-aortic, iliac lymph nodes

•**Perineural invasion**

•**Hematogenous metastases:** bone (most often found in the vertebrae & sacrum), lung, liver



• **Bony metastases** are often osteoblastic & are associated with elevated serum **alkaline phosphatase**

VI Tumor markers

- **PSA:** used as screening test and for assessing the response to treatment.
- **CEA**
- **Prostatic acid phosphatase**.
- **Alkaline phosphatase** in bone metastasis

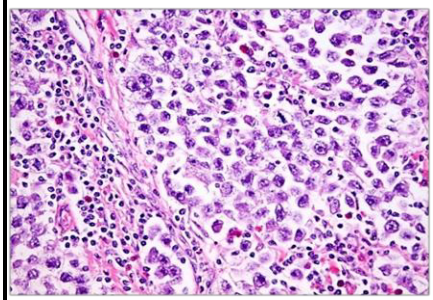
Osteosclerotic vertebral metastasis

Testicular Tumors		
Germ Cell Tumor (90%)	**Non-germ cells tumors (3%)**	**Lymphoma (7%)**

• **Seminoma.**
• **Non-seminoma:**
  ○ **Teratoma.**
  ○ **Yolk sac:** Produce α fetoprotein
  ○ **Embryonal carcinoma.**
  ○ **Choriocarcinoma:** Produce HCG.
• **Combined** (e.g. seminoma + teratoma)
	• **Leydig cell tumor:**
	Produce androgen (precocious puberty).
	• **Sertoli cell tumor:**
	Produce estrogen (feminizing characters as gynecomastia)	

6- Germ cell Tumors

Seminoma

Incidence	• **Most common** germ cells with gonadal differentiation. • **Age:** 40-50y (Unknown before puberty). • **Radiosensitive**	
Predisposing factors	• Genetic factors • Undescended testis • Atrophic testis • Venereal diseases (infections)	
NE	Well defined, fleshy, homogenous cut section **(potato like).**	
ME	• **Cellular Arrangement:** Nests and sheets of spermatogenic cells with clear cytoplasm (due to glycogen content). • **Nuclear Features:** Cells have a large nucleus and prominent nucleolus. • **Stroma:** Tumor cells are separated by fibrous septa, which are rich in lymphocytes and plasma cells.	
Spread	• **Local:** tunica vaginalis, epididymis, spermatic cord and scrotal skin. • **Lymphatic:** common iliac and pancreatic L.N. → mediastinal and supraclavicular L.N • **Blood:** Lung, then brain and bones	

Non-seminoma

- **Incidence:** Less common germ cells with embryonic differentiation.
- **Age:** 20y, may occur before puberty.
- **Radioresistant.**
- **Include:**

Teratoma	formed of tissues derived from ectoderm, mesoderm and endoderm
Yolk sac	secretes Alpha fetoprotein
Choriocarcinoma	secretes human chorionic gonadotrophins (HCG).
Embryonal carcinoma	---
Combined	(e.g. seminoma+ teratoma).

7- Non-germ cell Tumors

I Incidence

Most of these are benign, representing 3% of testicular tumors and arise from non-germinal cells (Leydig and Sertoli cells). **Called sex cord stromal tumors**

II Classification

1. Leydig (interstitial) cell tumor:

It produces androgens which lead to:

- **Before puberty:** leads to sexual precocity.
- **After puberty**: no body changes are detected.

2. Sertoli cell tumor: It produces estrogen leading to feminizing characters

8- Miscellaneous

Diseases affecting veins of spermatic cord:

- Varicocele

Diseases affecting tunica vaginalis:

- Chylocele
- Hydrocele
- Haematocele

	Varicocele	Chylocele	Hydrocele	Hematocele
Def	Varicosity of the pampiniform plexus of **veins** in the spermatic cord	Accumulation of **lymphatic** fluid within tunica vaginalis	Collection of **serous fluid** within tunica vaginalis	Collection of **blood** within tunica vaginalis
Causes	**1. Primary**: Occur in young unmarried men. **2. Secondary:** Usually in middle age. **due to:** ○ Pressure on the spermatic vein as kidney tumor ○ Right side heart failure ○ Venous thrombosis	It is due to lymphatic obstruction e.g. in filariasis	**1. Primary:** unknown cause **2. Secondary** **due to:** ○ Diseases of testis, epididymis and spermatic cord ○ Trauma, torsion of testis ○ Inflammations ○ Tumors. ○ Generalized oedema	**1. Primary:** unknown cause **2. Secondary** **due to:** ○ Trauma ○ Malignant tumors of testis. ○ Hemorrhagic blood diseases
Pathology	• A bag of warm-like masses is felt in the scrotum • Defective spermatogenesis	---	---	---
Effects	---	---	• Pressure atrophy of testis • 2ry infection (pyocele)	• Pressure atrophy of testis. • 2ry infection (pyocele). • Organization & fibrosis