Male

Penis

Malformations

- Congenital
- most commonly at the urethral orifice

① Hypospadiasis (HYP)

* - abnormal opening of distal urethral orifice (along ventral aspect of shaft)
  - orifice may be constricted → obstruction + ↑ UTI risk and maybe urine recurrence
  - surgery required

② Epispadias

* - presence of urethral orifice on dorsal aspect
  - may result in obstruction or urinary incontinence
  - associated with extrophy (congenital bladder malformation)

Inflammatory Lesions

- mostly caused by STDs
- local inflammatory processes unrelated to STD and other systemic inflammatory diseases may produce penile lesions

① Balanitis

- local inflammation of the Glans penis

② Balanopthitis

- inflammation of Glans penis + overlying prepuce (foreskin)
- mostly occur in consequence of poor local hygiene in uncircumcised males
- may have any of multiple bacterial, or fungal origins, or caused by contact dermatitis
- Grossly: - distal penis inflamed, red, swollen, tender, purulent discharge

3 Phimosis

- Prepuce cannot be retracted easily over glans penis
- Some are congenital, but most are acquired (from scaring of prepuce secondary to previous Balanoposthitis episodes)

Neoplasms of the Penis

- > 95% → SCC
  - uncommon in US ~> 0.4% of all cancers in male
  - occurs at much higher rates in developing countries
- most cases occur in :-
  1- uncircumcised, older than 40 years old
  2- poor hygeine → exposure to potential carcinogens (Smoking, HPV 16, 18)

1 SCC of the penis

- appearance of malignant cells confined to epidermis "intra epithelial neoplasia" "carcinoma in situ"
- 3 clinical variants (all strongly HPV associated)

1. Bowen Disease

- older uncircumcised males
- Grossly: Solitary, plaque-like lesion on shaft
- * Histopathology: malignant cells throughout epidermis, no invasion into underlying stroma "in situ"
- 33% → progess into invasive SCC
- Malignant features :-
  - hyperchromatic, dysplastic, dyskeratotic epithelial cells
  - scattered mitosis above Basal layer

2. Erythroplasia of Queyrat

- Bowen disease presenting as erythematous patch on glans penis

3. Bowenoid Papulosis

- in young sexually active males
- Histologically → identical to Bowen Disease
- Clinically: - multiple reddish-brown papules on glans
  - transient
  - rare progression to carcinoma (progression in case of immunocompetent)

(2) Penile SCC

- gray-crusted papular lesion on glans penis or prepuce
- * may infiltrate underlying tissue → indurated ulcer with irregular margins
- Histopathology → infiltrating keratinizing SCC
- most cases are indolent, locally infiltrative
- 25% → regional LN infiltration (pelvic LN → para-aortic LN)
- distant metastasis uncommon, 5 year survival rate → 70%
- Verrucous carcinoma (variant of SCC)
  - papillary architecture
  - rounded pushing deep margins
  - less striking cytological atypia
- Grossly: deformed glans penis (ulcerative, infiltrating cancer)
- requires surgical resection

Scrotum

* - Bag of skin that holds and helps protect the testicles
- testicles make sperm → temperature must be cooler than inside body ⇒ scrotum located outside
- testicles produce hormones → testosterone
- Epididymis located on top of each testicle
- Spermatic chord - Cremaster muscle

Scrotal Enlargement

- Congenital in children

1. Hydrocele → most common cause
   - accumulation of serous fluid within tunica vaginalis
   - idiopathic or responce to neighboring infections or tumors (TB, trauma, hernia, Strangulation)
   - must be distinguished from true testicular mass → using Transillumination
     - hydrocele → transilluminate
     - testicular mass → opaque

less common

2. Hematocele
   - accumulation of blood
3. Chylocele
   - accumulation of lymphatic fluid

Testis & Epididymis

- May Be → Congenital
  → inflammatory
  → neoplastic

- may manifest as → atrophy
  → enlargement
  → local pain
  → Cryptorchidism
  → infertility

- mumps cause orchitis

Congenital

① Cryptorchidism ⇝ Congenital

- Failure of testicular decent into scrotum (right testis > left testis involvement)
  ↳ normally decends by 3rd month of gestation into pelvis then into scrotum during last 2 months of intrauterine life (if doesn't not decent by 1 year of life → surgery)
- 1% of males → Cryptorchidism by 1 year of age → 10% = bilateral
- usually unknown cause, rarely: hormonal, intrinsic testicular, and mechanical abnormalities
- Effects :-
  - Bilateral (10%) → Sterility
  - Unilateral → atrophy of contralateral descended gonad + Sterility
    ↳ ↑ risk for developing cancer in contralateral normally descended testis
    → due to intrinsic abnormality
    ↳ orchiopexy before puberty → ↓ likelihood of atrophy + ↓ cancer and infertility risk
  - 3-5 fold ↑ risk of testicular cancer

- Orchiopexy
  ↳ Surgical placement of undescended testis into scrotum
  ↳ reduces risk but does not eliminate risk

- Cryptorchid testis may be normal size → early life, some degree of atrophy → puberty
- * Histologically :-
  - tubular atrophy → 5-6 years of age
    ↳ Caused by: - Chronic ischemia - Anti-neoplastic Chemotherapy - Radiation - Trauma - Chronic hyperestrogenism (cirhosis)
  - hyalinization → puberty
  - leydig cell hyperplasia
  - intratubular germ-cell hyperplasia (source of subsequent testicular cancers)

memorise

Inflammatory lesions

- more common in epididymis
- some associated with STDs
- * other causes :- - non-specific epididymitis - mumps
  - orchitis - Tuberculosis

1 Non-specific epididymitis + orchitis

- begin as primary UTI → secondary ascending infection to testis (through vas deferens or spermatic chord lymphatics)
- presentation of testis : - swollen - tender - contains neutrophilic cell infiltrate

* 2 orchitis complicates

- mumps infection in 20% of adults
- rarely in children
- presentation of testis : - edematous - congested
  - lymphoplasmacytic cell infiltrate
  - some cases → atrophy, fibrosis, sterility

- focal atrophy
  ↳ childhood mumps infection → patchy orchitis

3 Granulomatous inflammation

- caused by some infections and autoimmune diseases
- TB most common
  ↳ testicular TB begins in epididymis → secondary testis involvement
- Histologically : - caseous granulomatous inflammation

Testicular Tumors

* - most important cause of firm, painless testis enlargement (20-34 year olds)
- 95% ⟶ arise from germ cells (gonads) and are malignant
- Sertoli or Leydig cells ⟶ uncommon, usually benign
- increased risk if ⟶ Cryptochidsims
  ⟶ Intersex syndromes
  ⟶ Siblings of males with testicular cancer
- more common in whites (↑ incidence in Caucasian populations)
- most common abnormality ⟶ isochromosome of short arm of Chromosome 12

- 2 Categories for TGCTs (Testicular Germ cell Tumors)

❑ Tumors with **One Histologic Pattern** (**60%**of cases)
I) Seminoma,
II) Non-seminomatous T including:
- Embryonal carcinoma,
- Yolk sac tumor,
- Choriocarcinoma,
- Teratomas – Mature & Immature & with malignant transformation of somatic elements.

❑ **Tumors with More Than One Histologic Pattern (40%)**
❑ This classification is based on the view that testicular germ cell T arise from primitive cells that may either differentiate along

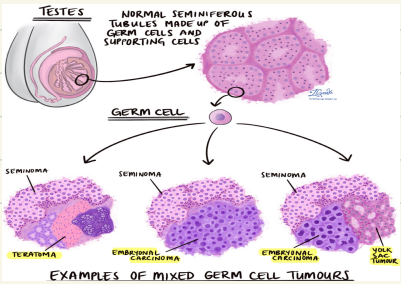
(I) Gonadal lines to produce seminomas.
Transform into a totipotential cell population, giving rise to non- seminomatous germ cell T.Such totipotential cells:

(a) may remain **undifferentiated** to form embryonal ca.or
(b) may **differentiate along extra-embryonic** lines to form yolk sac tumors& choriocarcinomas.
may **differentiate along somatic cell** lines to produce teratomas.

- most TGCTs arise from intratubular precursor cell "germ cell neoplasia in situ (GCNIS)"
  ↳ embryonic germ cell ⟶ potential to differentiate into plethora of embryonic and extraembryonic lineages

* - GCNIS ⟶ originate from developmentally arrested immature germ cells (gonocytes) that fail to differentiate to spermatogonia

- Intratubular germ cell neoplasia (IGCN)
  ↳ Seminiferous tubules lacking spermatogenesis
  ↳ Sertoli cells displaced toward lumen



EXAMPLES OF MIXED GERM CELL TUMOURS

- Clincal Features
  - painless testis enlargement
  - nonseminomatous ⟶ widespread metastasis at diagnosis

- Clinically it is best to consider TGCTs under 2 broat Categories :-
  1 - Seminomas
    - remain confined to testis and reach considerable size befor diagnosis
    - Lymphatic metastasis most commonly to ⟶ iliac + Para-aortic LN
    - Hematogenous metastasis occurs later
    - good prognosis , very radiosensitive , respond well to chemotherapy

  2- Non-Seminomatous
    - metastize earlier by blood (most commonly liver + lungs) and lymphatics
    - poor prognosis ⟶ improved by platinum based chemotherapy in some cases

- TGCT staging
  - Stage I : Confined to testis
  - Stage II : regional LN metastasis only
  - Stage III : non-regional LN ± distal organ metastasis

- Tumor markers
  - hCG ⟶ produced by syncytiotrophoblastic cells
  - AFP

1. Nonseminomatous germ cell T containing elements of yolk sac (endodermal sinus) often produce AFP (AFP is **also elevated in hepatocellular ca);**& in contrast to hCG,...
2. The presence of AFP is a reliable indicator of the presence of a nonseminomatous component in the germ cell T, as yolk sac elements are not found in pure seminomas.
3. As mixed patterns are common, most nonseminomatous T have elevations of both hCG & AFP.
4. Serial determinations of hCG & AFP are useful in the (A) primary diagnosis (B)staging(C) monitoring patients with testicular germ cell T for persistent or recurrent T after therapy

memorise * Seminomas

① Seminomas (classic) ⇝ 50% testicular germ cell tumors

- histologically identical to ovarian dysgerminomas
- * Grossly :-
  - potato like (large, soft, well-demarcated, homogeneous)
  - grey-white, bulges from cut surface of affected testis
  - large seminoma → foci of necrosis without hemorrhage
    - ↳ if hemorrhage present → examination for non-seminomatous
- * Histologically :-
  - distinct cell borders
  - clear, glycogen rich cytoplasm
  - round nuclei + conspicuous nucleoli
  - granulomatous inflammatory reaction
  - cells arranged as small lobules
  - intervening fibrous septa
  - infiltrated by lymphocytes
- * 25% → stain positively for human Chorionic gonadotropin (hCG)
  - ↳ hCG expressing cells morphologically similar to syncytiotrophoblast → source of ↑ hCG
    - ↳ hCG + syncytiotrophoblast → pure seminoma

- hCG → pregnancy test
  - ↳ when hCG + in male → seminoma

② Spermatocytic Seminoma

- less common
- morphologic variant of seminoma
- in older patients
- contain mixture of medium-sized, large unicleate or multinucleate T-cells, and small cells with round nuclei that are reminiscent of secondary spermatocytes
- * different to classic seminoma in :-
  1- no association with intratubular germ cell neoplasia
  2- metastasis is exceedingly rare
- Best prognosis between all Seminomas

* Non-Seminomatous Tumors

1) Embryonal Carcinoma → worst type

- highly malignant, invasive tumor containing foci of hemhorrage + necrosis
- primary lesion = small (even with systemic metastasis), large lesion → invade epididymis + spermatic chord
- Histologically:
  - large cells, primitive looking, basophilic cytoplasm, indistinct cell borders, large nuclei + prominent nuclei
  - cells may be arranged in undifferentiated solid sheets, or contain glandular structures and irregular papillae
  - * Other patterns of germ cell tumors are admixed with embryonal ones (usually mixed with other T *)
- Pure embryonal carcinomas (rare) → 2-3% of all testicular germ cell tumors

2) Yolk Sac Tumors → endodermal sinus tumor

- most common primary testicular tumor in children < 3 years old (adults → admixed with embryonal)
- Grossly: large, well demarcated
- Histologically:
  - microcytes, sheets, glands, papillae formed
  - often associated with eosinophilic hyaline globules
  - Schiller-Duval bodies
  - α-fetoprotein (AFP) (seen in cytoplasm by IHC techniques + may be in blood)

- Schiller-Duval Bodies → structures that resemble primitive glomeruli
- AFP → test related to fetus and pregnancy (present in male → abnormality / tumor)

3) Choricarcinomas

- differentiation of pluripotential neoplasic germ cells along trophoblastic lines
- Grossly: small, non-palpable lesions (even with extensive systemic metastasis)
- Histologically:
  - hemhorrage and necrosis
  - Cytotrophoblast capped by Syncytiotrophoblast
    - Source of hCG detected in cytoplasm by IHC staining

- Cytotrophoblast → sheets of small cuboidal cells
- Syncytiotrophoblasts → large, eosinophilic syncytial cells containing multiple dark pleomorphic nuclei

4) Tetratomas (TT)

- differenciation of pluripotential neoplasic germ cells along somatic cell lines
- firm masses, on cut surface often contain cysts and areas of cartilage
- Histologically → 3 variants of pure TT

1. Mature TT
   - Contain fully differentiated tissue from one or more germ cell layers in haphazard array
     ↳ (neural tissue, cartilage, adipose tisse, bone, epithelium)

2. Immature TT
   - Contain immature somatic elements
     ↳ similar to those in developing fetal tissue

3. TT with somatic-type malignancies
   - development of frank malignancy

- Pure TT in prepubertal males are usually benign
* - TT in adults should be alway be regarded as malignant; because :-
  1- often contain other malignant germ cell elements
  2- 37 % → metastize

* Mixed Germ cell tumors

- 40 %
- most common
  ↳ Combination of tetratoma, embryonal carcinoma, yolk sac tumors