Testicular Disorders

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Developmental Disorders

- **Cryptorchidism (undescended testis)**
- Failure of testis to descend into the scrotum.
- Incidence: 0.5% of male infants
- Associated with testicular atrophy & sterility
- This condition is associated with increased incidence of germ cell tumours (seminoma & embryonal carcinoma)
  - Risk is still high even after surgical removal

Developmental Disorders

- **Hydrocele**
- Most often cause is idiopathic
- Sometimes congenital in origin – persistence of continuity of tunica vaginalis with peritoneal cavity
- Secondary – lymphatic blockage by infection or tumours
- Can be distinguished clinically from solid tumors by transillumination

Other Disorders: testicular swelling

- Hematocele – accumulation of blood distending to tunica vaginalis.
  - Often caused by trauma but occasionally due to a tumour
- Varicocele – varicose dilation of multiple veins of spermatic cord – "bag of worms" feeling on examination.
- Spermatocele – sperm containing cyst. Often intratesticular

Testicular Atrophy

- Etiology is unknown
- May be caused by or associated with:
  - Orchitis – especially mumps orchitis
  - Trauma
  - Hormonal excess or deficiency due to:
    - Disorders of hypothalamus or pituitary
    - Hormonal therapy, especially estrogens
    - Cirrhosis of the liver
  - Cryptorchidism
  - Kleinfelter syndrome
  - Chronic debilitating disease
  - Old age

Inflammation of Testis

- **Orchitis**
- Bacterial origin, often associated with epididymitis
- Can be caused by sphyilis
- Viral origin often due to mumps virus
- When bilateral can lead to sterility: due to atrophy of seminiferous tubules
  - Serum testosterone is decreased, FSH & LH elevated

Inflammatory Disorders of Testis

- **Epididymitis**
- More commoner than orchitis
- Most causes are infective in origin:
  - *Nisseria gonorrhoeae*
  - *Chlamydia trachomatis*
  - *Esherichia Coli*
  - *Mycobaterium tuberculsis*

Important Facts of Testicular Tumors

- Uncommon, incidence: 5/100,000 men
- <1% of all malignancies in men
- Peak: 30-40 years, rare in prepubertal children & elderly
- >90% are of germ cell origin
- >90% are malignant
- Serum tumor markers found in 50% of patients. Eg: AFP, hCG

Testicular Tumors

- 2 major categories
  - Germ cell tumors – 95% of testicular tumors
    - Highly aggressive
    - Most can be treated successfully.
  - Non germ cell tumors – derived from stroma or sex cord
    - Generally benign

Pathological Classification

TABLE 21-5 Pathologic Classification of Common Testicular Tumors

Germ Cell Tumors

Seminoma
Spermatocytic seminoma
Embryonal carcinoma
Yolk sac (endodermal sinus) tumor
Choriocarcinoma
Teratoma

Sex Cord–Stromal Tumors

Leydig cell tumor
Sertoli cell tumor

Seminoma

- Malignant germ cell tumour
- Analogous to dysgerminoma (ovarian tumuor)
- Common germ cell tumour (40% of germ cell tumours)
- Peak incidence: mid 30s
- Presents as painless enlargement of testis
- Radiosensitive – good prognosis even with metastasis
- Sometimes with increased hCG

Embryonal Carcinoma

- Malignant germ cell tumour
- Analogous so similar tumour of same name occurring in ovary
- Second most common germ cell tumour – 20-30% of cases
- Poor prognosis compared to seminoma
- Increased serum hCG

Endodermal sinus (yolk sac) tumuor

- Malignant germ cell tumor
- Analogous to endodermal sinus tumor of ovary
- Peak incidence in infancy & childhood
- Common testicular tumor in this age group
- Elevated serum AFP

Teratoma

- Derived from 2 or more embryonic layers (endoderm, ectoderm, mesoderm)
- 25-35% of germ cell tumours
- Contains multiple tissue types – cartilage islands, ciliated epithelium, liver cells, striated muscles, bone
- Classified into 3 subtypes:
- Mature: almost always malignant (corresponding tumour [dermoid cyst] in ovary is almost always benign)

Teratoma

- Immature teratoma:
- Teratoma with malignant transformation: contains malignant tissues e.g. squamous cell carcinoma

Choriocarcinoma

- Malignant germ cell tumour
- 1% of germ cell tumours
- Occurs as an element of other germ cell tumours
- Analogous to choriocarcinoma of the ovary
- Incidence: 20-30 highest incidence
- Characterised by cells resembling synciotrophoblasts & cytotrophoblasts
- Elevated serum hCG

Mixed Germ Cell Tumours

- Consists of varying combinations of germ cell tumor types
- Variable prognosis & determined by least mature element
- Combinations include:
  - Teratoma, embryonal carcinoma & seminoma
  - Embryonal carcinoma and seminoma
  - Teratocarcinoma – common combination. Composed of teratoma & embryonal carcinoma

Non-Germ Cell Tumors

- 2 common ones
- Leydig cell (interstitial tumor)
- Sertoli cell tumor (androblastoma)

Leydig cell tumor

- Non germ cell tumor
- Derived from testicular stroma
- Similar to Sertoli-Leydig cell tumor of ovary
- Benign tumor
- Histologically characterized by intracytoplasmic Reinke crystals. What are Reinke crystals?
- Can produce androgen, estrogen and corticosteroids
- Associated with precocious puberty in children & gynecomastia in adults

Sertoli Cell Tumor (androblastoma)

- Derived from sex cord-stroma
- Similar to Sertoli-Leydig cell tumor of ovary
- Benign
- Characterised by paucity of endocrine manifestations

Laboratory Diagnosis

Tumor markers (2 classes) & biopsy

- Onco-fetal Substances : AFP & HCG
- Cellular Enzymes : LDH & PLAP
- Tissue Biopsy & diagnosis
- FNAB contraindicated in suspected malignant tumour of testis as it allow seeding of malignant cells into distant sites.

AFP - Trophoblastic Cells

HCG - Syncytiotrophoblastic Cells

(PLAP- placental alkaline phosphatase, & LDH lactic acid dehydrogenase)

Alpha feto protein

NORMAL VALUE: Below 16 ngm / ml

HALF LIFE OF AFP – 5 and 7 days

Raised AFP :

- Pure embryonal carcinoma
- Teratocarcinoma
- Yolk sac Tumor
- Combined tumors,
- AFP not raised in pure choriocarcinoma , & in pure seminoma

Human Chorionic Gonadotropin

Has α and β polypeptide chain

NORMAL VALUE: < 1 ng / ml
HALF LIFE of HCG: 24 to 36 hours

RAISED β HCG -

100 %	**- Choriocarcinoma**
60%	**- Embryonal carcinoma**
55%	**- Teratocarcinoma**
25%	**- Yolk Cell Tumour**
7%	**- Seminomas**

END

Main reference: Robins Pathological Basis of Disease.

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