



Diseases of the Epididymis and Testicular Tumors

Lecture 3

430 Pathology Team

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Red: Doctors' and important notes.

Green: Team notes.

Epididymitis and ORCHITIS (inflammation of the testis):

- Diseases of the testis can be: inflammation, tumors, congenital anomalies and infections. However, (**neoplasia**) is the most common.
- Inflammatory conditions are generally more common in the epididymis than in the testis. However, some infections, notably **syphilis**, **may begin in the testis** with secondary involvement of the epididymis
- Epididymitis and possible subsequent orchitis are commonly related to infections in the urinary tract (cystitis, urethritis, genitoprostatitis)
- These infections reach the epididymis/testis through either the vas deference or the lymphatics of the spermatic cord

1. Non-specific inflammation:

Occur mostly as a result of urinary infections. E.g: epididymitis .

Epididymitis:

Causes: Varies with age

- **Children:** uncommon, usually associated with a congenital genitourinary abnormality and infection with **Gram -ve rods**.
- In sexually active men **< 35 years** → **Chlamydia trachomatis** and **Neisseria**
- Older than **35 Years** → **gram -ve, E.Coli** and **Pseudomonas**.

Microscopic findings:

- **Non specific acute inflammation** characterized by congestion, edema and infiltration by lymphocytes, neutrophils and macrophages.
- Initially involves the interstitial connective tissue → later involves tubules → may progress to frank abscess.
- Often followed by **fibrous scarring**.
- **Leydig cells are not usually destroyed (therefore androgen levels are normal)**

2. Granulomatous (Autoimmune) Orchitis:

- Usually middle -aged men, unilateral testicular mass .
- **Moderately tender** but sometimes may present as painless **testicular mass; mimicking a testicular tumor**.
- Although an autoimmune basis is suspected, the cause of these lesions remains **unknown**.
- May be a response to **acid-fast products of disintegrated sperm**, **post-infectious**, or due to **trauma** or sarcoidosis
- **Microscopically: granulomas (against sperm production)**, restricted within the spermatic tubules (**seminiferous tubules**).

Specific Inflammations:

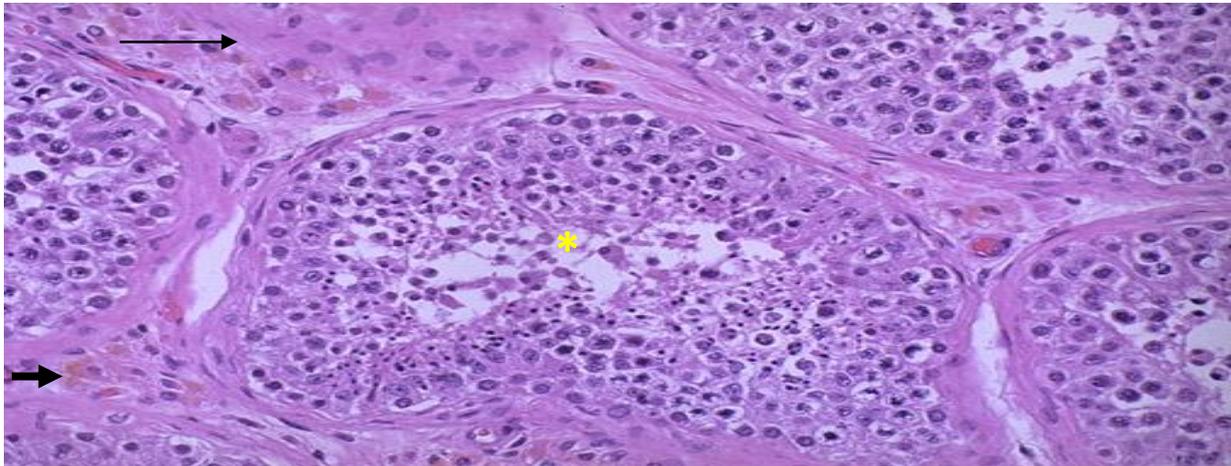
Gonorrhea:

- **Extension of infection** from the posterior **urethra** → prostate → seminal vesicles → epididymis is the usual course of a **neglected gonococcal infection**.

- Can lead to **frank abscess** may spread to testis and can produce a suppurative orchitis (suppurative=causing pus discharge).

Tuberculosis:

- Almost invariably **begins in the epididymis and may spread to the testis.**
- In many of these cases ,there is associated tuberculous prostatitis and seminal vesiculitis
- **Microscopy: Caseating** Granulomatous inflammation.



Pink Leydig cells are seen here in the interstitium(arrow). Note the pale golden brown pigment as well(bold arrow). There is active spermatogenesis (*)

Testicular Torsion:

It is an emergency condition that is seen in young age group who presents with severe acute pain in the testicular area. As a result block of the blood vessels causes congestion, enlargement and hemorrhage of the testis in gross appearance.

Testicular Tumors:

- Complex **mixture of anatomic types**
- **95%** of them **originate from germ cells** which are generally malignant.
- Age group→15-30 years, whites> blacks
- Most of gem cell tumors are **highly aggressive** cancers
- Capable of wide ,extensive dissemination
- Current therapy ,most of them **can be cured**
- **Non germinal** tumors are generally **benign**

Classification:

1. **Germ cell tumors :**

❖ **Seminomatous:**

- Seminoma (classic)
- Spermatocytic seminoma

❖ **Non Seminomatous**

- Embryonal carcinoma
- Yolk sac (endodermal Sinus) tumor

- Choriocarcinoma
 - Teratoma
2. **Sex Cord Tumors** (most of the time they are benign)
- Leydig cell tumor
 - Sertoli cell tumor

Pathogenesis:

Predisposing factors:

1. Cryptorchidism (failure of the testis to descend into the scrotum):10% of testicular tumors
2. Testicular dysgenesis (Defective or abnormal development of the testis)
3. Genetic factors

Seminomatous germ cell tumors :

1. **Seminoma (classic):**

- Identical one occurs in the ovary (Dysgerminoma)
- The most common type of germ cell tumors (50%)
- Peak incidence in thirties (20-30) (Almost never occur in infants)

Morphology:

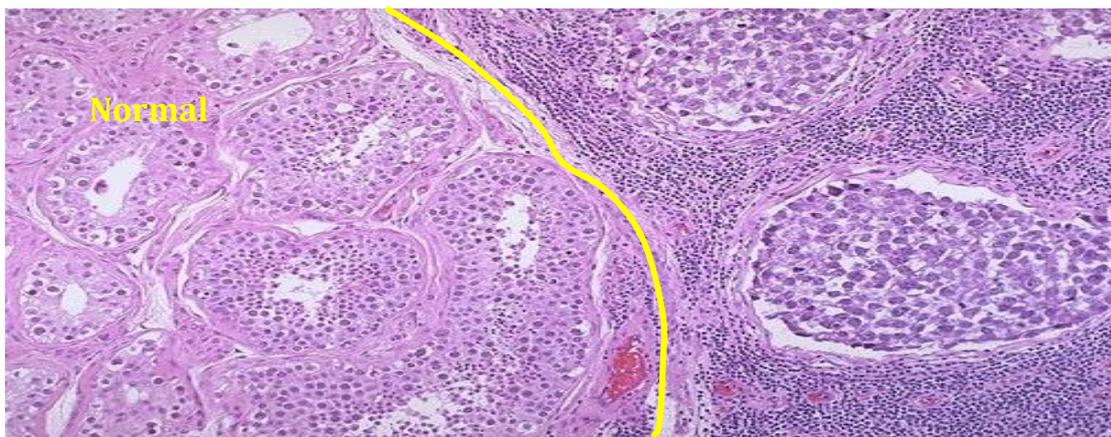
Grossly:

- Bulky masses, well-circumscribed
- Homogenous, pale, fleshy.
- Gray-white
- Lobulated cut surface
- Usually no necrosis or hemorrhage
- In 50% ,the entire testis is involved
- Occasionally extends to the epididymis, spermatic cord, or scrotal sac



Microscopically:

- sheets of uniform cells
- Lobules separated by delicate fibrous septa with many lymphocytes in between.
- Cells are large ,round ,has distinct cell membrane
- Large nucleus with prominent nucleoli
- Positive for PLAP (Placental alkaline phosphatase, an enzyme and tumor marker)



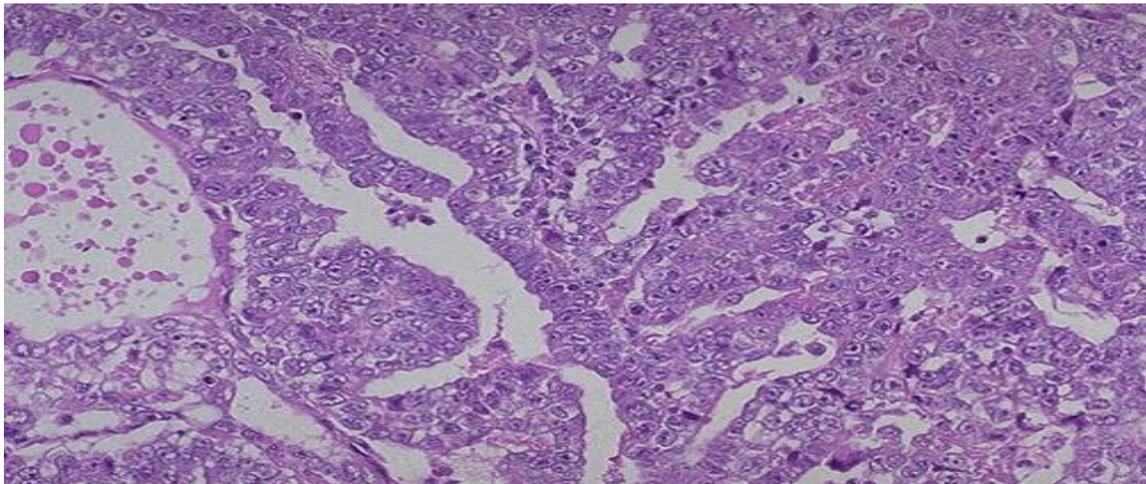
2. Spermatocytic Seminoma:

- Distinctive tumor, clinically and histologically
- 1-2 % of testicular tumors
- **Common in elderly over age 65**
- Slow growing tumor, rarely metastasize, mostly restricted to the testis.
- **Prognosis** is **excellent**

Non Seminomatous germ cell tumors:

1. Embryonal Carcinoma:

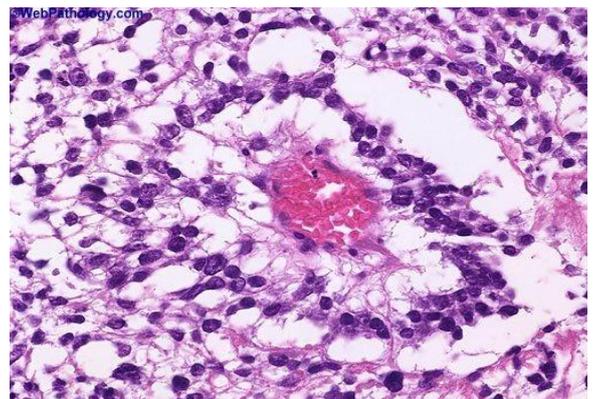
- 20 to 30 year age group
- More **aggressive** than seminomas
- **Smaller** than seminoma
- **Could be present with other neoplasm** in 45%
- **Grossly:** shows foci of **necrosis and hemorrhage**
- **Microscopically:** shows sheets of **undifferentiated cells** as well as primitive glandular differentiation. Cells grow in **alveolar or tubular pattern**, sometimes with papillary convolutions. The **nuclei** are **large and hyperchromatic**.
- **Marker:**CD30 positive

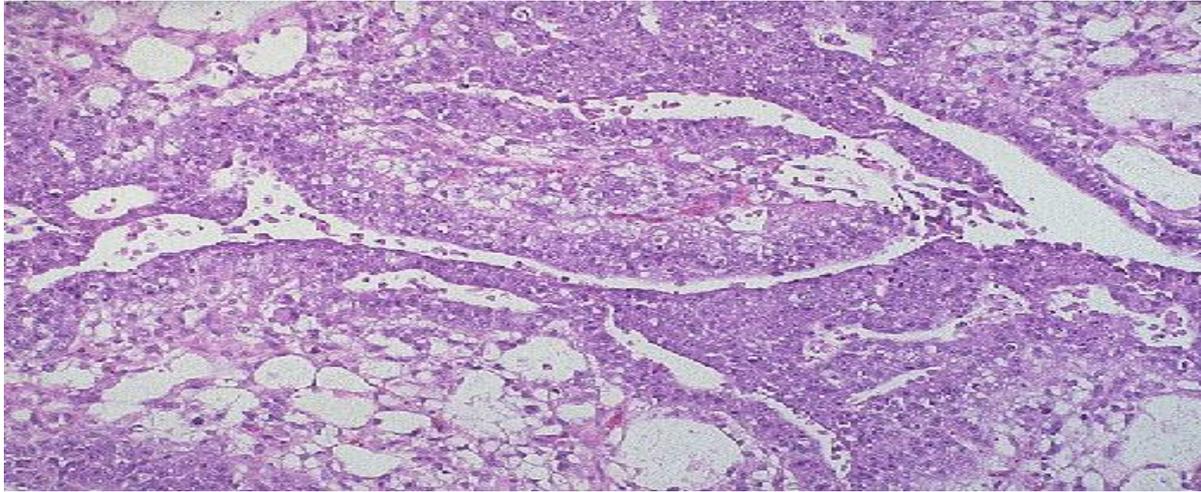


N.B: hemorrhagic mass = most likely embryonal carcinoma

2. Yolk Sac Tumor:

- Also known as Endodermal sinus tumor
- The **most common** tumor in **infant and children** up to 3 years of age
- Has a very good prognosis
- Non encapsulated ,homogenous ,mucinous appearance
- **Microscopically:**
 - structures resemble endodermal sinuses
 - **Schiller-Duval** bodies consists of a central vessel surrounded by tumor cells
 - Hyaline -**pink globules**
 - **AFP (α -feto protein) positive**





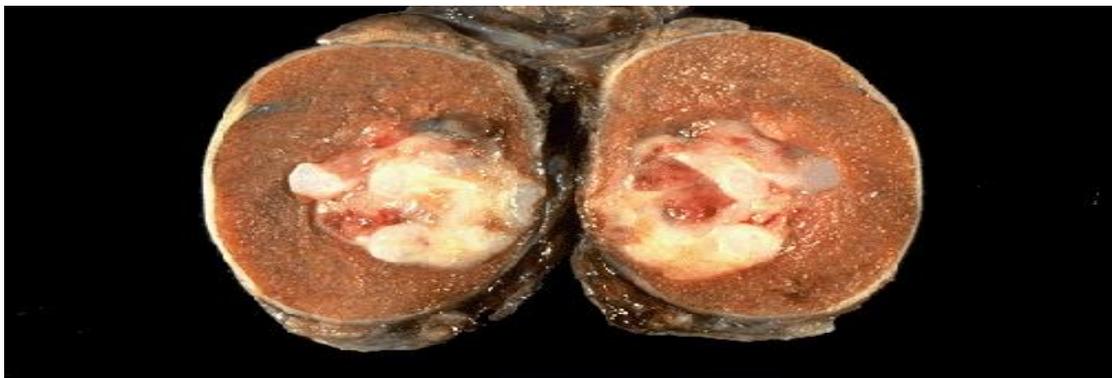
An endodermal sinus tumor (yolk sac tumor) of the testis is shown composed of primitive germ cells that form glomeruloid or embryonal-like structures. These tumors are most frequent in children, but overall they are rare.

3. Choriocarcinoma:

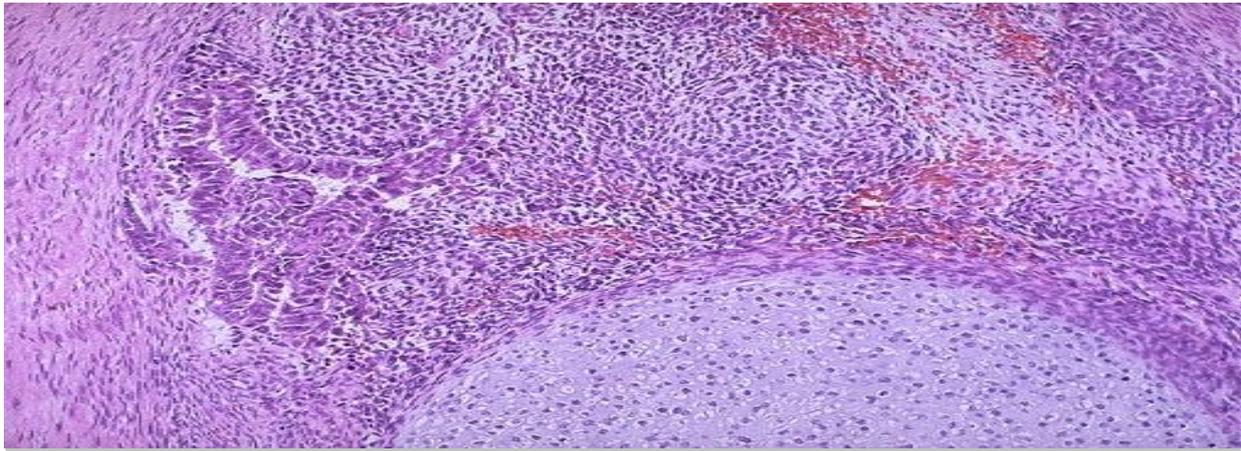
- Highly **malignant tumor**
- Proliferation of both cytotrophoblastic and syncytiotrophoblastic cells
- Small lesions
- **We see necrosis and hemorrhage**
- **Marker: β -HCG positive**

4. Teratoma:

- Any age ,infancy to adult life
- Mature forms are common in infants and children.
- Adult forms are rare
- As a component with other type in 45%
- Usually large 5 -10 cm
- Heterogenous appearance
- Hemorrhage and necrosis indicate embryonal component
- Composed of heterogenous collection of cells or organoid structures
- Neural tissue ,cartilage ,squamous epithelium ,glandular components....
- Germ cell tumors could arise from teratoma
- In **children ,mature** teratomas behave **benign**
- In **post pubertal** male, all teratomas regarded **malignant (unlike female type)**, and capable of metastasis, regardless of whether the elements are mature or not.



A small testicular carcinoma is shown here. There is a mixture of bluish cartilage with red and white tumor tissue. This neoplasm microscopically contained mainly teratoma, but areas of embryonal carcinoma were also present



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.

Clinical Features of testicular tumors:

- Biopsy of a testicular tumor is associated with a **risk of tumor spillage (spreading)**
- The standard management of solid tumors is radical orchiectomy **which is a surgical procedure to remove a testicle.**
- Lymphatic spread is common. **Retroperitoneal and para-aortic nodes** are first to be involved
- Hematogenous spread to Lung, liver, Brain, and bones.

Summary

- Inflammatory conditions are seen more in the epididymis than the testis except the syphilis which start in the testis then move to the other areas
- Majority of the inflammatory reactions in both the epididymis and testis come from the urinary tract.
- Causative organism in epididymitis varies with age: children and above 35 years of age gram -ve while for adult less than 35 the organisms are either Chlamydia trachomatis or Neisseria.
Histologically: non-specific inflammatory reaction + dying cells are not destroyed.
- Granulomatous orchitis are defined as the presence of granulomas in the seminiferous tubules.
- Gonorrhea is extension of the infection from the urethra. We see abscess like formation and some acute suppurative inflammation.
- Tuberculosis start in the epididymis. Microscopically we see caseating granuloma.
- Most of the testicular tumors are germ cells in origin which are malignant and highly aggressive but curable.
- Seminoma is the number one neoplasm in the testis, malignant, nodular, white to gray in color, no necrosis nor hemorrhage is seen (if seen, most likely is embryonal carcinoma or Choriocarcinoma. Microscopically, it is composed of uniform cells with distinct cell borders and many lymphocytes in between.
- Spermatocytic Seminoma is seen in elderly restricted to testis rarely metastasize and the prognosis is excellent.
- Embryonal carcinoma is seen in young age and can be seen with other neoplasia. Grossly, we find hemorrhage and necrosis and it is CD30 positive.
- Yolk sac tumor is number one tumor in infant age group. Microscopically we see Schiller-Duval bodies and it is AFP positive.
- Choriocarcinoma is highly malignant with necrosis and hemorrhage. The marker is β -HCG.
- Teratoma can affect any age group (in children it is benign most of the time). It is very common to be seen with other neoplasms.
- NO biopsy in testicular tumors (because of the risk of spillage) instead the standard management is orchiectomy

Questions

Q- What are the two major groups of testicular tumors?

A- 1-Germ cell tumors.

2-Nongerms cell tumors.

Q-What is seminoma?

A- the most frequently occurring germ cell tumor that presents as painless enlargement of the testis.

Q-What is an embryonal carcinoma?

A- an aggressive germ cell tumor that characterized by rapid and bulky growth, and often presents with pain and metastasis.

Q-Embryonal carcinoma has a peak incidence in males of what age group?

A- 20 to 30 years.

Q-What tumor marker can be found in the serum of patients with yolk sac tumors?

A- AFP

Q- What is a testicular choriocarcinoma?

A- A highly malignant neoplasm composed of both cytotrophoblastic and syncytiotrophoblastic elements that is often encountered as a component of mixed germ cell tumors.

Q- What tumor markers can be found in the serum of patients with choriocarcinoma?

A- hcg

Q- Unlike other germ cell tumors, how do choriocarcinoma metastasize?

A- Hematogenously.

Q-What are the two types of nongerms cell testicular tumors?

A- 1-Leydig cell tumor

2- Sertoli cell tumor

Q- A dysgerminoma is homologous to what testicular germ cell tumor?

A- Testicular seminoma.

Q-What is orchitis?

A- swelling/ inflammation of the testis secondary to viral or bacterial infection.