

Lecture 1

Male Genital Tract

Dr.Ahmed Raji

Testis

Testicular Atrophy

Atrophy is a regressive change that affects the scrotal testis.

Etiology

- (1) Progressive atherosclerotic narrowing of the blood supply in old age.
- (2) The end stage of an inflammatory orchitis.
- (3) Cryptorchidism.
- (4) Hypopituitarism.
- (5) generalized malnutrition or cachexia.
- (6) Irradiation.
- (7) Prolonged administration of antiandrogens (treatment for advanced carcinoma of the prostate).
- (8) Exhaustion atrophy, which may follow the persistent stimulation produced by high levels of follicle-stimulating pituitary hormone.
- (9) A primary failure of genetic origin, such as in Klinefelter syndrome.

Morphology.

Grossly

Testis is small in size and is firm in consistency as a result of fibrotic changes.

Microscopically

- 1- Arrest in the development of germ cells.
- 2- Marked hyalinization and thickening of the basement membrane of the spermatid tubules.
- 3- Some tubules appear as dense cords of hyaline connective tissue outlined by prominent basement membranes.
- 4- There is concomitant increase in interstitial stroma and Leydig cells are prominent.

Testicular Tumors

Testicular neoplasms are divided into two major categories:

- 1- Germ cell tumors.
- 2- Sex cord–stromal tumors.

Approximately 95% of testicular tumors arise from germ cells.

Most **germ cell tumors** are aggressive cancers capable of rapid, wide dissemination, although with current therapy most can be cured.

Sex cord–stromal tumors, in contrast, are generally benign.

Pathologic Classification of Common Testicular Tumors

Germ Cell Tumors Seminomatous tumors Seminoma Spermatocytic seminoma Non-seminomatous tumors Embryonal carcinoma, Yolk sac (endodermal sinus) tumor Choriocarcinoma Teratoma
Sex Cord-Stromal Tumors Leydig cell tumor Sertoli cell tumor

Etiology.

- 1- **Environmental factors**: the incidence of testicular germ cell tumors in Finland is about two times lower than in Sweden.
- 2- **Testicular dysgenesis syndrome (TDS)**: testicular germ cell tumors are associated with a spectrum of disorders known as *testicular dysgenesis syndrome (TDS)*. This syndrome includes cryptorchidism, hypospadias, and poor sperm quality.
- 3- **Klinefelter syndrome**: is associated with an increased risk (50 times greater than normal) for the development of mediastinal germ cell tumors, but these patients do not develop testicular tumors.
- 4- **Family predisposition**.

Germ cells tumors

Germ cell tumors are subdivided into **seminomas** and **non-seminomas (teratoma, embryonal carcinoma, choriocarcinoma, yolk sac tumor)**.

Clinical features of germ cell testicular tumors.

- 1- Painless enlargement of the testis is a characteristic feature of germ cell neoplasms,
- 2- Retroperitoneal and para-aortic nodes enlargements. Subsequent spread may occur to mediastinal and supraclavicular nodes.
- 3- Hematogenous spread is primarily to the lungs, but liver, brain, and bones may also be involved.
- 4- Germ cell tumors of the testis often secrete polypeptide hormones and certain enzymes that can be detected in blood by sensitive assays, such as biologic markers include HCG, and AFP, which are valuable in the diagnosis and management of testicular cancer.

Seminoma

Seminomas are the most common type of germ cell tumor, making up about 50% of these tumors. The peak incidence is the third decade and they almost never occur in infants. An identical tumor arises in the ovary, where it is called *dysgerminoma*.

Morphology.

Grossly

- 1- Bulky masses.
- 2- Homogeneous, gray-white, lobulated cut surface, usually devoid of hemorrhage or necrosis.

Microscopically

- 1- Sheets of uniform cells divided into poorly demarcated lobules by delicate septa of fibrous tissue containing a moderate amount of lymphocytes.
- 2- Seminoma cell is large and round to polyhedral and has a distinct cell membrane, a clear or watery-appearing cytoplasm; and a large, central nucleus with one or two prominent nucleoli.

Embryonal Carcinoma

Embryonal carcinomas occur mostly in the 20- to 30-year age group. These tumors are more aggressive than seminomas.

Morphology.

Grossly

- 1- The tumor is smaller than seminoma and usually does not replace the entire testis.
- 2- On cut surfaces the mass is often variegated, poorly demarcated, and punctuated by foci of hemorrhage or necrosis.

Microscopically

- 1- The cells grow in alveolar or tubular patterns, sometimes with papillary convolutions
- 2- More undifferentiated lesions may display sheets of cells.
- 3- The neoplastic cells are large and anaplastic, and have hyperchromatic nuclei with prominent nucleoli, the cell borders are usually indistinct, and there is considerable variation in cell and nuclear size and shape.

Yolk Sac Tumor

Also known as *endodermal sinus tumor*.

It is the most common testicular tumor in infants and children up to 3 years of age. In this age group it has a very good prognosis.

In adults the pure form of this tumor is rare; instead, yolk sac elements frequently occur in combination with embryonal carcinoma.

Morphology.

Grossly

- 1- The tumor is non encapsulated,
- 2- On cross-section it presents a homogeneous, yellow-white, mucinous appearance.

Microscopically

- 1- A lacelike (reticular) network of medium-sized cuboidal or flattened cells.
- 2- Papillary structures, solid cords of cells
- 3- In approximately 50% of tumors, structures resembling endodermal sinuses (Schiller-Duval bodies) may be seen; these consist of a core with a central capillary and a visceral and parietal layer of cells resembling primitive glomeruli.

Choriocarcinoma

Choriocarcinoma is a highly malignant form of testicular tumor. In its “pure” form choriocarcinoma is rare, constituting less than 1% of all germ cell tumors.

Morphology.

Grossly

- 1- Often they cause no testicular enlargement and are detected only as a small palpable nodule.
- 2- Typically, these tumors are small, rarely larger than 5 cm in diameter.
- 3- Hemorrhage and necrosis are extremely common.

Microscopically

The tumors contain two cell types:

The syncytiotrophoblastic cells are large and have many hyperchromatic nuclei and an abundant eosinophilic vacuolated cytoplasm.

The cytotrophoblastic cells are more regular and tend to be polygonal, with distinct borders and clear cytoplasm; and have a single, fairly uniform nucleus, they grow in cords or masses

Teratoma

Teratoma may occur at any age from infancy to adult life.

Pure forms of teratoma are common in infants and children.

In adults, pure teratomas are rare, constituting 2% to 3% of germ cell tumors. However, the frequency of teratomas **mixed** with other germ cell tumors is approximately 45%.

In the child, differentiated mature teratomas usually follow a benign course.

In the postpubertal male all teratomas are regarded as malignant, capable of metastatic behavior whether the elements are mature or immature.

Morphology.

Grossly

- 1- Usually large, ranging from 5 to 10 cm in diameter.
- 2- The appearance is heterogeneous with solid, sometimes cartilaginous, and cystic areas.
- 3- Hemorrhage and necrosis usually indicate admixture with embryonal carcinoma, choriocarcinoma, or both.

Microscopically

1- Teratomas are composed of a heterogeneous collection of neural tissue, muscle bundles, islands of cartilage, clusters of squamous epithelium, thyroid gland, bronchial or bronchiolar epithelium, and intestinal wall or brain substance, all embedded in a fibrous or myxoid stroma.

2- Elements may be **mature** (resembling various adult tissues) or **immature** (sharing histologic features with fetal or embryonal tissue).

3- Rarely, a malignant non-germ cell tumors may arise in teratoma. This phenomenon is referred to as “**teratoma with malignant transformation**,” where there is malignancy in derivatives of one or more germ cell layers. Thus, there may be a focus of squamous cell carcinoma, adenocarcinoma, or sarcoma.

Prognosis of testicular germ cell tumors

Prognosis of testicular germ cell tumors depend largely on clinical stage and on the histologic type.

Seminoma, which is extremely radiosensitive and tends to remain localized for long periods, has the best prognosis.

Pure choriocarcinoma has a poor prognosis.

Sex Cord-Stromal Tumors

The two most important members of this group—Leydig cell tumors and Sertoli cell tumors.

Leydig Cell Tumors

They may arise at any age, although most cases occur between 20 and 60 years of age. The most common presenting feature is testicular swelling. Tumors of Leydig cells may secrete androgens and in some cases both androgens and estrogens, and even corticosteroids. In some patients gynecomastia may be the first symptom in children, hormonal effects, manifested primarily as sexual precocity, are the dominating features. Most are benign.

Approximately 10% of the tumors in adults are invasive and produce metastases.

Morphology.

Grossly

These neoplasms form circumscribed nodules, usually less than 5 cm in diameter. They have a distinctive golden brown, homogeneous cut surface.

Histologically

Neoplastic Leydig cells usually are large and round or polygonal, and they have an abundant granular eosinophilic cytoplasm with a round central nucleus. The cytoplasm frequently contains lipid granules, vacuoles, or lipofuscin pigment.