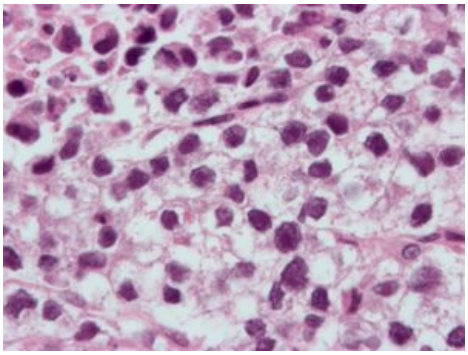
Germinal tumors

Germinal tumors are defined as tumors arising from multipotent stem cells that can further differentiate into germ cells or other tissues, both somatic and extrasomatic.

1. Tumors of **primordial cells** (gonocytes - their division produces sperm and eggs) - seminomas.
2. **Stem cell** tumors that differentiate into other tissues (non-seminoma tumors = teratomas in the broadest sense):
   - **somatic** - embryonic carcinoma, polyembryoma, teratomas in the narrower sense;
   - **extrasomatic** - yolk sac tumor, choriocarcinoma.

The most common site of germ cell tumors is the gonads (mainly undescended testes). However, they can also occur in other places where stem cells migrated during development - along the axial axis in the retroperitoneum , anterior mediastinum , sacrococcygeal landscape, at the base of the skull and in the area of the pineal gland . They occur mainly in children and at a younger age and are mostly malignant tumors (with the exception of mature differentiated teratomas). Although seminoma is malignant, it responds very well to radiotherapy.

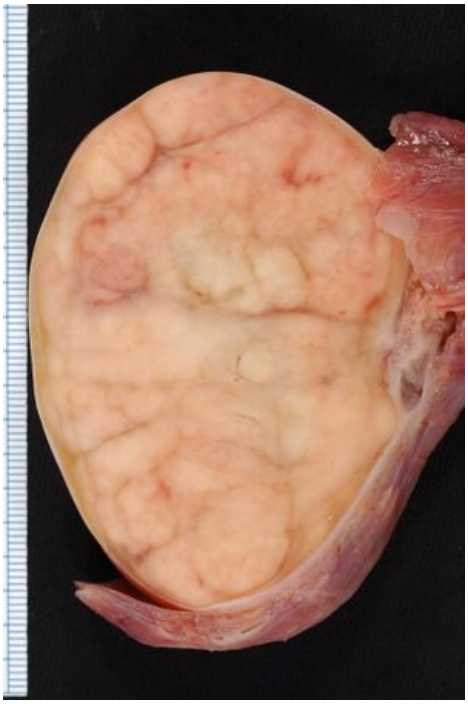


Seminoma (microscopy)

Seminom

- In the ovary and extragonadal localization it is called **dysgerminoma** ;
- it occurs mainly in middle-aged men, in the ovaries in children;
- malignant .

Microscopy : It consists of bands or solid deposits of gonocyte-like cells (large, rounded polygonal cells with large nuclei with one to two nucleoli, light cytoplasm containing glycogen and distinct intercellular boundaries). The stroma consists of characteristic fibrovascular septa with lymphocyte infiltration. Stromat cells can transform into epithelioid cells and large multinucleated Langhans-type cells - forming tuberculoid granulomas (their presence, together with inflammatory infiltration, is a good prognostic feature). In addition to this so-called classical variant, there is also anaplastic, trophoblastic and spermatocyte seminoma. In addition to seminoma structures, gonadoblastoma also contains Sertoli cells .



Seminoma of the Testis

Macroscopy : It manifests itself up to multiple magnification of the testicle. The tumor is solid, homogeneous, gray-pink, or with necrosis. The entire testicle is often affected, in which the tumor grows destructively. It usually occurs only in the testis, but in advanced stages it grows into the rete testis, epididymis , seminal sacs and testicular sheaths. It metastasizes to the lumbar nodes.

Prognosis : up to 3 cm good, over 6 cm significantly worse .[1].

Spermatocyte seminoma

- It does not occur outside the testicles;
- men around the age of 55;
- malignant, but make up only about 2% of all testicular tumors.

Microscopy : A tumor is composed of three types of cells that are mixed with each other, small, medium, and large. The middle cells have the largest representation. Chromatin is fibrous.

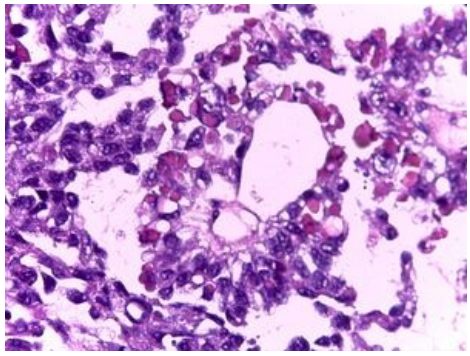
Macroscopy : Spermatocyte seminoma does not occur outside the testis, but is not related to seminoma, and we do not microscopically **detect IGCNU (intratubular** germinal neoplasia of unclassified type - the initial lesion of other germinal tumors) in preserved testicular canals. The tumor can be bilateral - the second testicle is affected metachromously. It grows slowly and is locally aggressive. It grows into the tunica vaginalis, epididymis, or even into blood vessels, but does not **metastasize**. It has a characteristic slimy appearance in cross section.[2]

Tumor from the yolk sac

- Highly malignant;
- in its pure form, it is the most common malignant germ cell tumor of the epididymis in infants and young children (about 18 months);
- in adults in pure form rare;
- often part of mixed tumors.

Microscopy : Tumor cells are similar to the epithelium of the yolk sac (polygonal cells with round nuclei arching the central part of the cytoplasm), formed by a system of communicating crevices lined by tumor cells, tumor cells also line radially around thin-walled vessels, which then pass into epithelial microcysts - structures resembling primitive glomerulus (so-called Schiller-Duval bodies), an important feature of the tumor is the production of α1-fetoprotein , which is a diagnostic marker and indicator of the success of therapy, forming hyaline droplets in the cells.

Macroscopy : The tumor is unbounded, yellow.


Shiller Duval body

Embryonic carcinoma

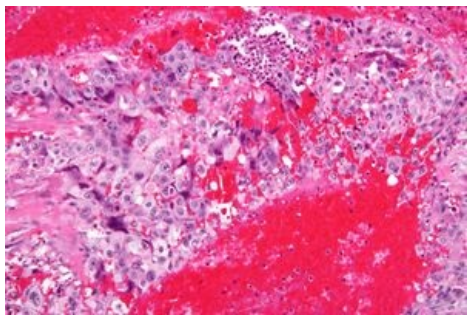
- Highly malignant , extremely undifferentiated;
- it usually occurs in mixed tumors (where its presence is an unfavorable diagnostic feature).

Microscopy : epithelial tumor (positive for cytokeratins, unlike seminoma). It consists of large basophil cells with hyperchromic nuclei and large nucleoli. Glycogen is present in the cytoplasm. The cells are usually solidly arranged and the cell boundaries between them are not clear. There are no lymphocytes in the stroma, there are multinucleated cells producing hCG - sarcomatoid and syncytiotrophoblast.

Macroscopy : The tumor is small (up to 4 cm), grayish-white, perfused, unbounded with necrosis deposits. In the early stage, it spreads *per continuity* - to the rete testis, epididymis, vas deferens.

Choriocarcinoma

- Malignant;
- trophoblastic tumor (it can occur both as a germinal tumor and as part of a trophoblastic disease , in 1/3 of which it is connected to a hydatidosis or proliferation mole);
- produces hCG , the level of which in the blood is a diagnostic marker and an indicator of the success of the therapy;
- metastasizes hematogenously (lungs , brain , bones , liver).


Choriocarcinoma - high mag

Microscopy : the tumor parenchyma has the form of a trophoblast (syncytiotrophoblast - basophilic multinuclear elements, cytotrophoblast - bright Langhans cells), but there is no arrangement into villi, no tree is present, bleeding is common (physiological property of trophoblast invasion is preserved, it is divided into several types:

- Dissociated;
- undifferentiated;
- differentiated.

- Syncytiotrophoblastic;
- cytotrophoblastic;
- mixed.

Macroscopy : The tumor is soft, perfused.

Prognosis : In a woman in connection with pregnancy , the prognosis is good, even with metastases in the lungs, she responds to chemotherapy , but without a connection with pregnancy, the prognosis is poor.

Polyembryom

- Rare in pure form;
- malignant;
- it is usually part of mixed tumors of the teratoma series.

Microscopy : The tumor parenchyma is arranged in so-called **embryonic bodies** embedded in a thin binder. The bodies resemble the somatic tissues of the germinal target from the 8th day of embryo development. Pure polyembryom contains more than 90% of bodies.

Teratom in the narrower sense (teratomas differentiated)

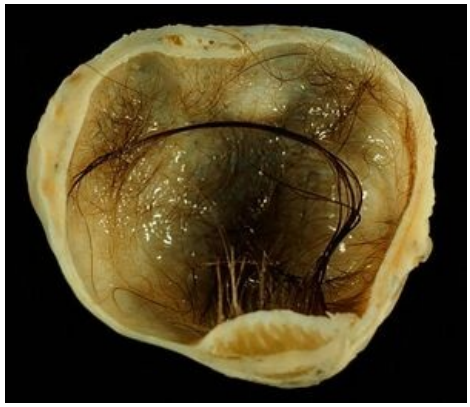
These are tumors in which the somatic tissue is represented by one, two or all three germ layers of varying degrees of differentiation. It is similar to a mixed tumor, but the tumor parenchyma cannot be derived from local tissues (teratomas are heterologous tumors). According to the degree of maturity, they are divided into:

- teratom **differentiated mature** (maturum, coetan) - tissue maturity corresponds to the age of the wearer;
- teratom **differentiated immature** (immaturum, embryonic);
- teratoma **undifferentiated** (the above-mentioned non-seminoma tumors with somatic differentiation - embryonic carcinoma + polyembryoma).

The degree of maturity of the tumor, the sex of the individual and the location of the tumor determine the chosen therapy, which may only be surgical, or may include chemotherapy. [3]

Koaetas teratoma

- "Ko" = the same, "aetas" = age, the components of the tumor are as mature as the organism;
- mostly **benign** (eg in the ovary), but most **malignant** in men after puberty ;
- common in women in the ovaries (when it consists only of skin called a dermoid cyst), in newborns in the sacral region or growing out of the oral cavity.



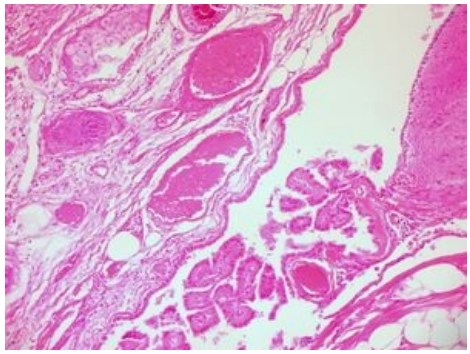
Mature cystic teratoma of ovary

Microscopy : Any differentiated tissues may be present (skin and adnexa, teeth, respiratory and intestinal epithelium, salivary glands, thyroid gland , mucous epithelium , smooth and skeletal muscles, adipose tissue, cartilage , bone ,...). If one tissue significantly predominates over the others (which can then be difficult to prove), we speak of so-called **monodermal teratomas** , an example is the so-calledovarian goiter , when thyreroid tissue predominates in the ovarian teratoma (it can be a source of ectopic thyrotoxicosis).

Macroscopy : unilocular cystic formation, most often enveloped by skin turned through the skin into the cavity, with its derivatives.

Teratom differentiated with malignant reversal

Designation for coetan teratoma, originally benign, in which some of its originally well-differentiated tissues were malignant (most often the epithelium of the dermoid cyst - the formation of squamous cell carcinoma).



Mature Cystic Teratoma of the Ovary (3776273154)

Teratom immature

It is similar to a differentiated mature teratoma, but the differentiation of individual components (or only some of them) is not at the highest level. Signs of malignancy up to sarcoma are present .

- ***Macroscopy*** : The tumor often has a solid structure.
- ***Prognosis*** : Biological behavior is malignant, prognosis is poor. The tumor grows rapidly, spreads hematogenously, lymphogenically and, after rupture of the capsule, also by implantation.

Mixed germ cell tumors

They are more common than pure germ cell tumors, consisting of at least two of the tumor structures listed above. ***Prognosis*** : the prognosis is worsened by the admixture of undifferentiated structures (embryonic carcinoma type) or extrasomatic structures (choriocarcinoma type and yolk sac tumor), their quantitative representation is also applied prognostically.

Alternative distribution

1. Tumors arising from the most primitive stem cells - embryonic carcinoma, polyembryoma.
2. Tumors from tissues slightly higher differentiation:
   - extrasomatic tissues - yolk sac tumor, choriocarcinoma;
   - somatic tissues - teratomas in the narrower sense;
   - tumors from the embryonic base of the gonads - seminoma (dysgerminoma).

Links

Related articles

- Testicular seminoma (preparation)
- Stem cells
- Gestational Trophoblastic Disease
- Malignant tumors in gynecology
- Choriocarcinoma (preparation)

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- PASTOR, Jan. *Langenbeck's medical web page* [online]. [feeling. 2012-01-12]. <

https://langenbeck.webs.com/ >.

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- POVÝŠIL, Ctibor, Ivo ŠTEINER and Pavel DUŠEK, et al. *Special pathology.* 2nd edition. Prague: Galén, 2007. 430 pp. ISBN 978-807262-494-2 .

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2. ↑ PANDEY, Vinita, Yasmeen KHATIB and Archana Laxman KHADE, et al. Spermatocytic seminoma with rhabdomyoblastic differentiation: Case report and review of literature. *Indian J Pathol Microbiol* [online] . 2018 Jul-Sep, vol 61, no. 3, pp. 437-439, also available from < https://doi.org/10.4103/IJPM.IJPM_243_17 >. ISSN 0377-4929 (print), 0974-5130.
3. ↑ MICHALSKI, Wojciech, Joanna JONSKA-GMYREK and Grazyna PONIATOWSKA, et al. Testicular teratomas: a growing problem ?. *Med Oncol* [online] . 2018, vol. 35, no. 12, p. 153, also available from < https://doi.org/10.1007/s12032-018-1215-3 >. ISSN 1357-0560 (print), 1559-131X.

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