Germ cell tumors

Germ cell 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 from **primordial cells** (gonocytes - their division produces sperm and eggs) - seminomas.
2. Tumors from **stem cells**that differentiate into other tissues (non-seminoma tumors = teratomas in the broader sense):
   - **somatic** – embryonal carcinoma, polyembryoma, teratomas in the narrower sense;
   - **extrasomatic** – yolk sac tumor, choriocarcinoma.

The most common site of germinal tumors are the gonads (mainly undescended testicles). They can also occur in other places where stem cells migrated during development – along the axial axis in the retroperitoneum, anterior mediastinum, sacrococcygeal region, 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. náhled|vpravo|250px|Seminom (mikroskopie) náhled|vpravo|250px|Seminom vyplňující celé varle

Seminoma

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

Microscopy: It consists of bands or solid foci 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 lymphocytic infiltration. Stromal cells can transform into epithelioid cells and large multinucleated cells of the Langhans type - until they form tuberculoid granulomas (their presence together with inflammatory infiltration is a good prognostic sign). In addition to this so-called classic variant, there are also anaplastic, trophoblastic and spermatocytic seminoma. Sertoli cells are also found in gonadoblastoma in addition to seminoma structures.

Macroscopy: Manifests up to multiple enlargement of the testicle. The tumor is solid, homogeneous, grey-pink, possibly with necrosis. The entire testicle is often affected, in which the tumor grows destructively. It is mostly found only in the testicle, but in advanced stages it grows into the rete testis, epididymis, , seminal vesicles and scrotum. It metastasizes to the lumbar nodes.

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

Spermatocytic seminoma

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

Microscopy: The tumor is composed of three types of cells that are mixed with each other, small, medium and large. Middle cells are the most represented. Chromatin is fibrous.

Macroscopy: Spermatocytic seminoma does not occur outside the testicles, but it is not related to seminoma, and microscopically we do not demonstrate **IGCNU** (intratubular germinal neoplasia of unclassified type - primary lesion of other germinal tumors) in preserved testicular ducts. The tumor can be bilateral – the other testicle is metachromically affected. It grows slowly and is locally aggressive. It grows into the tunica vaginalis, the epididymis, possibly even into the blood vessels, but it **does not metastasize**. It has a characteristic slimy appearance in cross-section.[2]

Yolk sac tumor

250px|náhled|vpravo|Patognomická Schillerova-Duvalova tělíska

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

Microscopy: Tumor cells are similar to the epithelium of the yolk sac (polygonal cells with round nuclei dominating the central part of the cytoplasm), it is formed by a system of communicating slits lined with tumor cells, tumor cells are also arranged radially around thin-walled vessels, which then prolapse into epithelial microcysts –

structures reminiscent of primitive glomeruli (so-called Schiller-Duval bodies), an important feature of the tumor is the production of α1-fetoprotein , which is a diagnostic marker and an indicator of the success of therapy, hyaline droplets form in the cells.

Macroscopy: The tumor is unbounded, yellow.

Embryonal carcinoma

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

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

Macroscopy: The tumor is small (up to 4 cm), grey-white, bloody, unbounded with foci of necrosis. In the early stage, it spreads per continuitatem – to the rete testis, epididymis, vas deferens.

Choriocarcinoma

náhled|300px|Vysoce maligní choriokarcinom

- Malignant;
- a tumor arising from the trophoblast (can occur both as a germinal tumor and as part of a trofoblastic disease, when in 1/3 of cases it follows a hydatid or proliferative mole)
- produces hCG, the level of which in the blood is a diagnostic marker and an indicator of the success of therapy;
- it metastasizes hematogenously (lungs, brain, bones, liver).

Microscopy: the tumor parenchyma has the appearance of a trofoblast (syncytiotrophoblast – basophilic multinuclear elements, cytotrophoblast – bright Langhans cells), however, there is no villous arrangement, stroma is not present, bleeding is frequent (the physiological property of trofoblast, invasion is preserved , it is divided into several types:

- Dissociated;
- undifferentiated;
- differentiated.

- Syncytiotrophoblastic;
- cytotrophoblastic;
- mixed.

Macroscopy: The tumor is soft, bloodied.

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

Polyembryoma

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

Microscopy: The tumor parenchyma is organized into so-called **embryonic bodies** embedded in a thin connective tissue. The bodies resemble the somatic tissues of the germinal target from the 8th day of embryo development. A pure polyembryoma contains more than 90% corpuscles.

Teratoma in the narrower sense (differentiated teratomas)

náhled|200px|Diferencovaný teratom ovária (makroskopie) náhled|250px|Diferencovaný cystický teratom ovária (mikroskopie) These are tumors in which the somatic tissues of one, two or all three germ layers of different degrees of differentiation are represented. It resembles 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:

- **differentiated mature** teratoma (maturum, coetaneous) – the maturity of the tissues corresponds to the age of the carrier;
- teratoma **differentiated immature** (immaturum, embryonic);
- **undifferentiated** teratoma (the aforementioned non-seminoma tumors with somatic differentiation – embryonal 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 can be only surgical or include chemotherapy.[3]

Coetaneal teratoma

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

Microscopy: Any differentiated tissues may be present (skin and adnexa, teeth, respiratory and intestinal epithelium, salivary glands, thyroid gland, mucus-forming 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 are talking about so-called monodermal teratomas , an example is the so-called struma ovarii, where thyroid tissue predominates in the ovarian teratoma (it can be a source of ectopic thyrotoxicosis).

Macroscopy: unilocular cystic formation, most often covered with skin inverted into the cavity, with its derivatives.

Teratoma differentiated with malignant reversal

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

Immature teratoma

It resembles 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 the image of a 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, lymphogenously and, after rupture of the capsule, also via implantation.

Mixed germinal tumors

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

Alternative distribution

1. Tumors originating from the most primitive stem cells – embryonal carcinoma, polyembryoma.
2. Tumors from tissues of 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).

Odkazy

Related articles

- Testicular seminoma (preparation)
- Stem cells
- Gestational trophoblastic disease
- Malignant tumors in gynecology
- Choriocarcinoma (preparation)

Zdroj

-

Použitá literatura

-
-

Reference

1.
2.
3.

Kategorie:Patologie Kategorie:Onkologie Kategorie:Vnitřní lékařství Kategorie:Chirurgie Kategorie:Gynekologie