

THE USE OF MINIMALLY INVASIVE TECHNIQUES IN THE TREATMENT OF BENIGN TUMORS OF THE CEREBELLUM

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Summary. The article considers the possibility of using cryotherapy tumors of the cerebellum. Negotiated benefits and drawbacks of current treatments. It describes the main symptoms of a tumor of the cerebellum and the modern methods of diagnosis. On the basis of the conclusions of materials that characterize the clinical picture of tumors of brain structures [3 figs, bibliography: 9 refs.].

Keywords: astrocytoma, angioreticuloma, benign tumors, cryotherapy, cryosurgery, cryoprobe, invasive technology glioblastoma, minimally, imaging control, medulloblastoma.

Global cancer deaths and about 70% of global deaths from lung cancer [5, 6].

According to the literature and to the WHO determined the structure of children's malignant tumors of the brain (Fig. 1) and in individuals under the age of 30 years (Fig. 2).

According to forecasts, the number of cases of cancer will continue to grow from 14 million in 2012 to 22 million in the next decade (Fig. 3) [1]. The tumor of the cerebellum is one of the types of brain tumors. Cerebellar tumor can be benign or malignant, the most diverse on the histological structure. Even if the tumor is benign nature, due to its special location it can pose a direct threat to the life of the patient because of the possibility of infringement of brain structures in violation of breathing and blood circulation. The tumor of the cerebellum cerebral manifests itself, and distant focal (cerebellar) signs. For the diagnosis of this pathology is mandatory computed tomography (CT) or magnetic resonance imaging (MRI) of the brain. Treatment of tumor of the cerebellum mainly operational. In this article you will learn about the basic symptoms, methods of diagnosis and treatment of tumors of the cerebellum.

Among all the tumors of brain tumors in the cerebellum share of about 30%.

Like all nervous system tumors, tumors of the cerebellum can be primary (if they are a source of neural cells or membranes of the brain) and secondary (if they are different localization of tumor metastasis).

On histological structure of the tumor of the cerebellum are also varied (there are more than 100 species). However, the most common are gliomas

cerebellum (medulloblastoma and astrocytoma) and cancer metastases.

Cerebellar gliomas account for more than 70% of all tumors of the posterior fossa. In young children, histologic tumor often are medulloblastoma, in middle age – angioreticuloma astrocytomas. In the mature and elderly palm belongs to the metastasis of cancer and glioblastoma.

Tumors of the cerebellum may have a relatively benign slow growth, settling apart from normal

The structure of the children's cancer incidence for 2014–2015

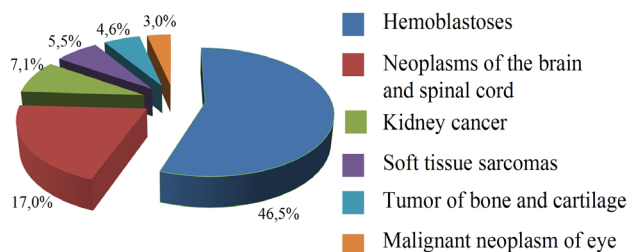


Fig. 1. Structure of child cancer incidence for 2014–2015¹

The structure of the incidence of malignant tumors in individuals under the age of 30 years 2014–2015

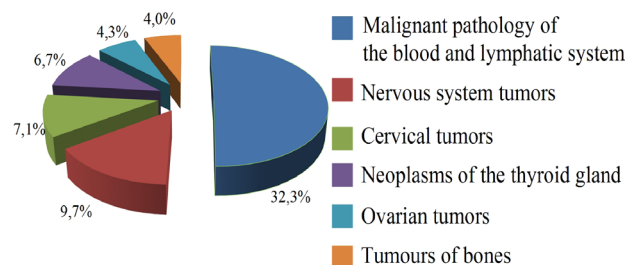


Fig. 2. Structure of the incidence of malignant tumors in individuals under the age of 30 years 2014–2015¹

¹ <http://www.knigamedika.ru/novoobrazovaniya-onkologiya/statistika-zabolevaemosti-rakom.html>

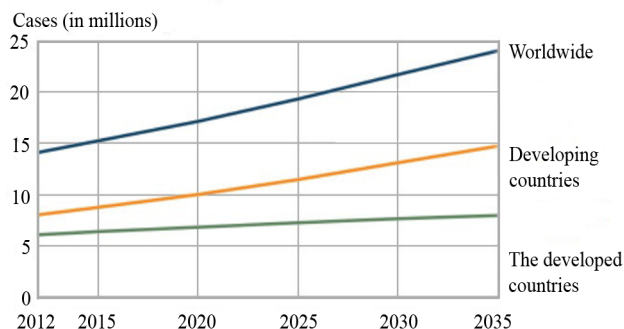
The forecast increase in cancer cases in the world

Fig. 3. The forecast increase in cancer cases in the world²

brain tissue (as if in a capsule), and may infiltrate surrounding tissues themselves, which in itself is less favorable [2].

Focal symptoms (actually cerebellar). These manifestations of tumor associated with direct tissue damage of the cerebellum. The cerebellum consists of several parts: the central and the worm located at the sides of the hemispheres (left and right). Depending on which portion compresses cerebellar tumor, experience various symptoms. If a worm infestation, it shows the following symptoms: a violation of standing and walking. Man swinging when walking or even standing, it stumbles on level ground and falls. Gait The movement resembles a drunk, cornering «pushes» toward. To stand still, it must be spread apart legs, balancing with his hands. With the growth of tumor instability manifests itself even in a sitting position.

If a tumor grows in the area of one of the hemispheres of the cerebellum, the broken fluency, accuracy and proportionality of movement on the side of the tumor (i.e., left or right). Man misses the mark when trying to take an object, he can not perform the actions associated with a rapid decline in the antagonist muscles (flexors and extensors). On the affected side decreased muscle tone. Changing the handwriting, the letters are large and jagged, like zigzag (this is also due to the violation of the right hand muscle contraction). Possible violations of the speech: it becomes intermittent, spasmodic, as if scanning divided into syllables. It appears tremors in the limbs on the side of the tumor, which is amplified by the end of the motion performed.

² <http://www.knigamedika.ru/novoobrazovaniya-onkologiya/statistika-zabolevaemosti-rakom.html>

As the tumor grows, it gradually symptoms of worm and the hemispheres are mixed, the process becomes a two-way.

In addition to the foregoing features, the patient may be detected nystagmus. This vibrational jerky involuntary movements of the eyeballs, especially when viewed from the side.

The proximity of the tumor of the cerebellum to the IV ventricle causes disturbances of cerebrospinal fluid circulation. Developing internal hydrocephalus with headaches, bouts of vomiting and nausea. Overlapping holes may be accompanied by the IV ventricle syndrome Bruns. This may occur when a sharp change in head position (especially when bending forward), in connection with which the tumor is displaced and closes holes for the circulation of cerebrospinal fluid. The syndrome manifests sharp headache, uncontrollable vomiting, severe dizziness, temporary loss of vision, dizziness. At the same time there are disorders of the heart and respiratory system, representing a danger to life [3].

Another dangerous condition that can occur when a tumor of the cerebellum, a brain tissue impairment. The fact that the growing tumor occupies part of the space inside the skull, and this space is constant. The rest of the brain tissue simply have nowhere to go, and it «moves» in the direction of the existing holes in the vicinity of the skull (in particular, the foramen magnum). Infringement possible and cutting out tentorium cerebellum (the latter formed by the dura mater). Infringement of brain tissue is very dangerous for humans, because at this moment he is in danger of losing his own life.

Diagnosics. For the diagnosis of tumors of the cerebellum plays an important role a thorough neurological examination, consultation with an ophthalmologist must fundus examination. The most informative for the diagnosis is radiation methods. Computed tomography (preferably MRI with intravenous contrast enhancement) can not only detect the tumor, but also to differentiate this disease from other series with the available patient symptoms of the cerebellum. With MRI you can see the features of the structure of the tumor, its location relative to the vasculature and a number of other features that help the physician during surgery to remove the tumor.

Treatment. Cryotherapy is recognized as one of the most effective methods for treating a num-

ber of serious diseases, and is a minimally invasive method of treatment, and therefore the least traumatic. It should be noted that the effect of low temperatures most effectively in cases where the disease is diagnosed at an early stage, or in cases where due to the individual characteristics of the patient operation is impossible.

In oncology, the cryotherapy method is particularly effective when the disease is in the initial stages of development. When the tumor is already diagnosed at a late stage, but for some reasons the operation to remove the tumors is not possible, cryotherapy is an excellent alternative to traditional surgery, and is used in combination with other cancer therapies.

Cryotherapy – a minimally invasive procedure that involves the use of extremely low temperatures to freeze and destruction of abnormal tissue, including cancer cells. Often the terms «cryotherapy» and «cryosurgery» interchangeably, whereas the term «cryosurgical treatment» is more suitable for open surgical procedures to access.

During cryotherapy applies a special tool such as a needle (cryoprobe) on which a tissue receiving liquid nitrogen or argon gas, freezing the cells. With the localization of abnormal areas inside the body of the procedure is performed under visualization Us-, CT or MRI control, which allows the physician to accurately summarize cryoprobe.

Cryotherapy is performed topically (to the skin), percutaneous or surgical access. It is shown that in some patients, cryotherapy is highly effective, whereas the efficacy of treatment in other cases, requires further study.

During cryotherapy using liquid nitrogen or argon gas, which allows for extremely low temperatures that destroy cells and tissues. Having deep tumors requires administration via the skin under the control of the visualization of one or more cryoprobes, through which is fed to a pathological hearth nitrogen or argon.

Living tissue, both healthy and diseased, excessively low temperatures can't stand. The loss of tissue occurs as a result of the following events:

- freezing the extracellular fluid, resulting in dehydration of the cells themselves;
- freezing the liquid inside the cells. At a temperature of -40°C or below in the cells begins on the formation of ice crystals, which destroyed-by virtually any cellular structures;

- rupture of the cell wall, caused by the accumulation of ice crystals within the cells, wrinkling or glue-current is caused by dehydration;

- blood flow disturbance. In the formation of ice crystals within the small vessels feeding the tumor, is the formation of blood clots and cancer cell death. Excessively low temperatures are maintained for 10–15 minutes as the thrombus requires, on average, at least 10 minutes. This ensures the formation of ice crystals.

Typically, cryotherapy, consists of several steps, during which the tumor sequentially frozen and thawed, which leads to death of cancer cells. Usually conducted at least two cycles.

After the destruction of tumor cells in effect immune cells, which remove dead tissue components and decomposition products.

Benefits. Compared to traditional surgery, recovery after cryosurgical surgery for liver tumors and kidney is much faster.

When percutaneous cryotherapy patient's discharge on the next day or a few hours after the procedure. With this treatment is not so painful as methods based on high temperature, such as high-frequency ablation. Acceptance of pain medication is usually not required. For patient percutaneous cryotherapy is not as traumatic as the operation with public access, since it requires only a small incision for introducing the cryoprobe, which limits the damage to surrounding healthy tissue. Consequently, percutaneous cryotherapy is less often accompanied by the development of side effects, and cost of the procedure is reduced. In addition, the patient can return to daily activities within a day after the treatment, or even earlier.

Risks. In all percutaneous interventions, there is a risk of bleeding: how cryoprobe from the injection site, and as a result the freezing of tissues. Injury to healthy tissues, damage nerve structures. Complete freezing of motor nerves leads to muscle weakness or numbness of the skin innervated by these nerves.

Possible complications associated with the use of the procedure of drugs, including local anesthetics or anesthetic drugs.

Restrictions during cryotherapy. Cryotherapy is an alternative to surgical treatment in cases when the tumor removal is difficult or impossible. However, the long-term effectiveness of this procedure only now being studied.

Posted a message on the occasion of percutaneous cryotherapy is not a lot. Cryotherapy is considered by local treatment, because it allows you to deal with pathological changes located in only one area of tissue. If metastases in other organs and tissues, this method of treatment, in contrast, for example, chemotherapy is not applicable.

Because cryotherapy is used imaging control, allowing the tumor to see only at the macroscopic level, the physician may miss the invisible microscopic cellular changes.

Percutaneous cryotherapy is still considered an experimental treatment, although the results of

its application in several clinical trials are promising.

Thus, a tumor of the cerebellum is a kind of brain tumor processes. Given the anatomical location of the cerebellum in the cranial cavity, its distinctive tumors have symptoms that are not always associated with damage to the tissue is cerebellum. As always there are tumor growth and more new symptoms. The decisive method for diagnosing a tumor in the cerebellum is magnetic resonance imaging with intravenous contrast enhancement using. Modern methods of treatment of a benign tumor of the cerebellum is cryotherapy.

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ЗАСТОСУВАННЯ МАЛОІНВАЗИВНОЇ ТЕХНОЛОГІЇ В ЛІКУВАННІ ДОБРОЯКІСНИХ НОВОУТВОРЕНЬ МОЗОЧКА

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Резюме. У статті розглянуто можливість застосування кріотерапії новоутворень мозочка. Обговорено переваги і недоліки сучасного методу лікування. Охарактеризовано основні симптоми пухлини мозочка і сучасні методи її діагностування. На основі наведених матеріалів зроблено висновки, що характеризують клінічну картину новоутворень структур головного мозку.

Ключові слова: астроцитома, ангиоретикулема, візуалізаційний контроль, гліобластоми, доброякісні новоутворення, кріодеструкція, кріозонд, кріотерапія, малоінвазивна технологія, медуллобластома.

ПРИМЕНЕНИЕ МАЛОИНВАЗИВНОЙ ТЕХНОЛОГИИ В ЛЕЧЕНИИ ДОБРОКАЧЕСТВЕННЫХ НОВООБРАЗОВАНИЙ МОЗЖЕЧКА

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Резюме. В статье рассмотрена возможность применения криотерапии новообразований мозжечка. Обговорено преимущества и недостатки современного метода лечения. Охарактеризованы основные симптомы опухоли мозжечка и современные методы ее диагностирования. На основе приведенных материалов сделаны выводы, характеризующие клиническую картину новообразований структур головного мозга.

Ключевые слова: астроцитома, ангиоретикулема, визуализационный контроль, глиобластома, доброкачественные новообразования, криодеструкция, кріозонд, кріотерапія, малоінвазивная технологія, медуллобластома.