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**CLINICAL MANIFESTATIONS OF TUMORS**

**BRAIN**

 **Ravshanov Davron Mavlonovich**Assistant at the Department of Neurosurgery, Samarkand State Medical University. Samarkand. Uzbekistan.

**Abstract:**

The incidence rate of primary brain tumors (PBT) and other CNS tumors in the United States from 2011 to 2015 was 23.03 cases per 100,000, so the total number of tumor cases was 392,982 (CBTRUS (Centra Brain Tumor Registry of the United State). All over the world with newly diagnosed malignant brain tumors. in 2012, 139,608 men and 116,605 were diagnosed women, amounting to a total of 256,213 person (CTBRUS). Incidence of primary malignant brain tumors and other central nervous system tumors in worldwide in 2012 was 3.4 per 100,000 people [1], in 2018 in England – 8.9 cases per 100,000 people, in France –10.2, Germany – 8.7, Russia – 6.6 (ECIS (European Cance rInformation System)) [2]. The most common histological type among PGMs is meningioma (36.4%), followed by

pituitary tumors (15.5%) and glioblastoma (15.1%) [3]. In recent years, there has been a noticeable increase in the incidence of glial tumors, up to 50% of which are glioblastomas, which makes it necessary to continue the search

solving problems of treating patients with malignant gliomas [4]. In the domestic literature, from the available material, we found that the incidence of malignant neoplasms of the brain and other parts of the central nervous system in the Russian population in 2016 was 6.21 for men and 5.81 for women per 100,000 people, mortality -5.70 (men) and 5.09 (women) per 100,000 [5]. Difference in average age between patients

for men and women with brain tumors was 3 years [6]. For example, the standardized incidence rate of primary CNS tumors in 2011 in the Arkhangelsk region was 6.2 per 100,000 male population and 4.8 per 100,000 female population; in St. Petersburg – 5.4 per 100,000 male and 4.6 per 100,000 female population; between 2000 and 2011, the peak incidence occurred at ages 60–69 years [7]. The incidence of POGM in the Rostov region in 2015 was 4.1 per 100,000 population [8]. The clinical picture of POGM is represented by general cerebral and focal symptoms. Neurological

the deficiency is determined by the location and volume of the tumor. The chronology of the sequential appearance of neurological symptoms reflects the nature and characteristics of tumor growth. Primary, local focal symptoms are early clinical symptoms caused by compression of areas of the brain adjacent to the tumor.

Secondary focal symptoms – focal symptoms “at a distance”, arising due to the spread of edema, ischemia of brain tissue or further growth of the tumor. Depending on the degree of removal of the lesion, there are symptoms “in the neighborhood” (collateral) and “at a distance” (distant).

The initial manifestations of tumor growth may be symptoms of irritation (hyperfunction) of the compressed area of brain tissue, which will later be replaced by symptoms of prolapse, characteristic of ischemic processes in the tissues.

General cerebral symptoms in most cases are associated with increased intracranial pressure and the development of cerebral edema. The subsequent development of the tumor process leads to dislocation of brain structures and the formation of herniation syndromes [9].

**GENERAL BRAIN SYMPTOMS AND SYNDROMES**

**Headache**

Headache is a common symptom of brain tumors. In a study conducted in Udine (Italy), of 206 patients with brain tumors, 48% had headache [15]. Headache occurs due to increased intracranial pressure and stretching of the dura mater. It is observed in 92% of patients with subtentorial and 77% with supratentorial tumors.

It is characterized as deep, bursting, growing and paroxysmal, accompanied by nausea and vomiting, which does not bring relief. With subtentorial localization, the intensity of pain depends on changes in head position, especially with IV tumors ventricle [9, 16]. Headache can be focal in nature, occurring due to irritation of cranial nerve receptors (trigeminal, glossopharyngeal, vagus) in the walls of veins, venous sinuses, adjacent membranes, large meningeal and cerebral arteries [9].

In the United States, a retrospective cohort study was conducted at George Washington University to determine the incidence of malignant brain tumor diagnosis and the mean time to diagnosis during the first year after a visit with a primary complaint of headache (n = 180,623). . Patients were divided into two cohorts: those examined using neuroimaging methods within 30 days after visits to the outpatient department with a complaint of headache

pain and not examined. Patients underwent computed tomography (CT) or magnetic resonance imaging (MRI) of the brain using current procedural terminology (CPT) and ICD-9-CM procedural codes. Malignant brain tumors were identified in 0.22% of patients (0.19–0.26%; n = 178) after presentation with headache. Overall incidence of malignant brain tumors was 0.33% (0.28–0.39%; n = 133) for the early group

neuroimaging and 0.11% (0.08–0.15%; n = 45) for reference group (p < 0.001). The mean time to diagnosis after a headache visit was 8 (3–19) days in group of early neuroimaging and 72 (39–189) days in reference group (p < 0.001)

**Vomit**

Vomiting occurs without preliminary nausea, regardless of food intake or when changing the position of the head (with tumors of the posterior cranial fossa), is often accompanied by headache and does not bring relief. It should be differentiated from vomiting at the height of dizziness in Meniere's syndrome [9, 16]. If the tumor is localized in the region of the fourth ventricle or in the cerebellum, then due to the direct mechanical effect on the vomiting center, vomiting will be focal in nature [9].

**Intracranial hypertension syndrome**

Intracranial hypertension syndrome is caused by

 the presence of a space-occupying formation in the cranial cavity, elements of occlusive hydrocephalus and cerebral edema. According to the Monroe–Kelly Doctrine, it is necessary

maintaining intracranial balance of brain tissue

(85%), cerebrospinal fluid (7%) and blood (8%), which reflects the normal value of intracranial pressure - 7–15 mm Hg Art.

The appearance of a cerebral tumor leads to their compensatory reduction, after which an increase in intracranial pressure and the development of brain dislocation are observed.

Intracranial hypertension syndrome is presented complex of clinical signs: headache, nausea, vomiting, mental disorders, meningeal symptoms, congestive changes in fundus, X-ray changes on craniograms (increased vascular pattern, digital depressions, osteoporosis of the dorsum sella) [9, 16].

**Congested optic discs**

Congestive optic discs are a consequence of intracranial hypertension and are detected in 50% of cases at a relatively late date. Along with this, sometimes, especially in children, there is congestion in the fundus

may appear as a debut symptom. Promotion intracranial pressure causes swelling tissue of the optic nerve and retina, which is manifested by the periodic appearance of a veil or the flickering of “flies” before the eyes, especially in the early hours. The outcome is secondary visual atrophy nerve [16].

**Epileptic syndrome**

The problem of epileptic syndrome is considered quite widely: observation of epileptic paroxysms in the clinic with cerebral t umors occurs in 50% of patients, but the relationship neoplasms at different stages of growth withfrequency. The occurrence and characteristics of seizures have not been sufficiently studied. Even less studied are the mechanisms that cause seizures during the progression of brain tumors, which are observed in 22–30.2% of patients with brain tumors, mainly supratentorial localization [18]. Most often, epileptic seizures are observed with astrocytomas, less often with meningiomas. As the first manifestation of cancer of the brain, epileptic seizures are observed in 36.7% of cases. With growing glial tumors, the first and only symptom of the disease is epileptic seizures. The highest risk of developing attacks was observed in slow-growing low-grade gliomas (75–90%) and anaplastic gliomas (65–70%), while in. In rapidly growing tumors (grade IV gliomas), epileptic seizures are observed only in 29–37% of patients [19]. To more fully characterize the issue under consideration, the work of M.V. Mukhacheva [18], which determines the clinical features of epileptic syndrome in patients with brain tumors.

**Dizziness**

Dizziness is often a general cerebral symptom in intracranial hypertension due to the development of congestion in the labyrinth and increased endolymph pressure in the semicircular canals. The factor of intoxication is of no small importance, especially for malignant tumors. Systemic dizziness due to the localization of the tumor process in the cerebellum, vestibulocochlear nerve, the area of the bridge and the IV ventricle can act as early symptom, manifesting itself as a sensation of rotation surrounding objects and one's own body or feelings “failure” [9].

**FOCAL NEUROLOGICAL SYMPTOMS**

**Anisoreflexia of deep reflexes**
Early pyramidal symptoms are detected in most In cases of patients, focal symptoms develop according to the mechanism of secondary focal symptoms [9].

**Sensory disorders**

Topical-diagnostic significance is given to disorders of the joint-muscular sense, which almost always act as primary focal ones, very rarely as symptoms “in the neighborhood” and almost never as symptoms “at a distance”.

**Changes in visual fields**

Localization of the tumor in the area of the chiasm or optic tract is manifested in the first case by heteronymous hemianopsia (almost always bitemporal, sometimes binasal), in the second - homonymous. 64% In patients with changes in visual fields, chiasmatic syndrome develops according to the “neighborhood” mechanism of action for tumors of the sellar region, in the rest - according to the mechanism of action.

**MENTAL DISORDERS AND PERSONALITY CHANGES**

According to the American Tumor Association brain, the frontal lobe is most often affected (about 22%), in particular the prefrontal cortex.

Karl Kleist (1934) described pseudodepression syndrome - a condition characterized by indifference, apathy, lethargy, decreased spontaneity, sexual interest, expressiveness of emotions, and inability to anticipate (pseudodepressive personality). Pseudodepression syndrome occurs in tumors prefrontal cortex. A. R. Luria in 1969 described apatoabulic syndrome, characterized by severe passivity, inertia and inaction as a result extensive and bilateral frontal lesions.

Kleist also found that patients with orbital frontal lesions may exhibit childish, playful behavior and unstable mood. According to D. Blumer and D.F. Benson, there are two frontal lobe syndromes:

■■pseudodepression, characterized by apathy, indifference, slowness and decreased inclination to talk;

■■pseudopsychopathic or pseudomanic syndrome characterized by courage, euphoria and chatty speech.

Pseudodepression closely resembles the psychomotor impoverishment syndrome seen in schizophrenia, while pseudomanic syndrome resembles disorganization syndrome.

There is controversy regarding the location in the frontal lobe of lesions that may cause these two frontal syndromes. According to clinical studies by K. Kleist, D. Blumer and D. F. Benson suggest that pseudodepression occurs due to lesions of the dorsal frontal lobe, while orbital lesions lead to pseudomanic syndrome [20].

In the study by P.N. Vlasov on the basis of the Research Institute of Neurosurgery named after. N.N. Burdenko studied the features and prevalence of the déjà vu phenomenon in patients with brain tumors (n = 197). It was found that most often the deja vu phenomenon occurs in astrocytomas of the right temporal lobe, combined with generalized seizures and olfactory hallucinations. The features of this phenomenon in brain tumors are: frequency (several times a day), duration (several minutes), it is accompanied by a negative emotional connotation and the presence of fear [21].

**Speech Impairment**

Aphasia is a rare focal symptom in brain tumors, usually primarily focal. The nature and degree of aphasic disorders depend mainly on the degree of destruction of the Broca's and Wernicke's centers by the neoplasm and on its histological properties. With brain tumors, aphasia was found in 9% of patients [9].

**Oculomotor disorders**

Brain tumors are characterized by paralysis and paresis of the III, IV and VI cranial nerves, paralysis and paresis

 gaze, nystagmus. Impact on the core, roots or trunk III, IV and VI nerves leads to paralysis or paresis of the external muscles of the eye. It should be noted that the most common presence of anisocoria, changes in pupil diameter and disorders of pupillary reactions [9].

**Cerebellar symptoms and syndromes**

Cerebellar tumors are located in the immediate proximity to liquor-containing spaces, thereby a good condition is created for the development of compensatory mechanisms of the brain, which is associated with late clinical manifestations [16].

**Cerebellar vermis syndrome (or midline syndrome)**

is a set of statokinetic symptoms (balance problems, inability to maintaining a vertical position in the absence paresis and paralysis of the limbs) and severe symmetrical muscle hypotonia or atony, as well as the presence of large-scale horizontal, vertical or rotatory nystagmus and scanned speech [9].

**Cerebellar hemisphere syndromepresented**

homolateral muscular hypotonia and atony, homolateral kinetic (dynamic) ataxia, combined with intentional trembling, asynergy, dysmetria and adiadochokinesis

**Conclusions**

Thus, presented in this article

Clinical and neurological symptoms of PGM can serve as a diagnostic guide for the clinical work of neurologists and oncologists. Knowledge of the specifics of the clinical picture will significantly increase oncological alertness, which will lead to early diagnosis and timely treatment of POGM, will help improve the quality of life and increase its duration.

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