

THE MODERN APPROACHES TO DIAGNOSIS AND TREATMENT OF CAVERNOUS ANGIOMAS OF THE BRAIN

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Cavernoma (cavernous malformity, angioma and hemangioma) congenital, usually not hereditary vascular anomaly. Hemangioma is one of the most rare encounter of vascular tumors of the brain, which can occur at any age as the result of accident or be the cause of serious neurological disorders.

It should be noted that recently there has been a significant increase in the number of patients with cavernomas in the brain; it can be associated with the improvement and expansion of diagnostic possibilities. Has also increased the number of detectable asymptomatic of caverna, malformations, manifested minimal non-specific symptoms, and a small caverna (up to 1 cm). Considering the fact that cavernoma are inherently benign tumors, determination of the indications for surgery is quite a difficult task. Surgical removal of cavernoma has established itself as an effective treatment method that eliminates the risk of hemorrhage and, in many cases, significantly improve the course of epilepsy. However, the experience of the various clinics showed that the operation, especially when cavernoma located in functionally important regions that may be associated with serious complications. Currently no clear indications for surgical treatment of caverna brain. Relation to the need and possibilities of surgical treatment of caverna largely determined by the experience of the particular clinic. In this regard, the analysis of results of surgical treatment of caverna brain and the role of different factors [1, 2] affecting treatment outcomes are a prerequisite for improving the quality of treatment of patients and define tasks for further research.

A special place in the study of this disease is diagnosis, as this malformation is a very "hidden". Cavernous angioma could be diagnosed only in rare cases, and often remained invisible during angiographic studies. The introduction into clinical practice of computed tomography (CT) significantly improved the detection of caverna. But it should also be noted that the diagnosis of this pathology on the basis of CT is often unreliable, the sensitivity of the method was quite low, and the specificity was only about 40%. An enormous breakthrough in the diagnosis of caverna was the advent of magnetic resonance imaging (MRI) in the arsenal of neurologists and neurosurgeons. Due to this, the number of patients with this pathology has grown rapidly, and has a high probability to identify cavernoma. In addition to studies of CT and MRI in some cases, the radiological diagnosis of caverna may be supplemented by positron emission tomography. Among the variety of clinical manifestations of cavernoma should be identified 4 main patterns: convulsions, focal neurological deficits, hemorrhages and headaches.

When we talk about the treatment of caverna, you must understand that there cannot be a single strategy that applies to all patients. Each case must be assessed on an individual plan, taking into account all the many factors. Convulsive syndrome is the most frequent indication for microsurgical removal of supratentorial caverna. The goal of surgical treatment is not only the relief of seizures, but also the prevention of hemorrhage. Treatment of drug-resistant epilepsy is not always accompanied by only removing cavernoma, but should be considered in the context of epilepsy surgery, that is, given the possibility of additional resection of epileptogenic areas of the brain.

The ultimate goal of surgical treatment of caverna is their total removal. Partial resection increases the risk of bleeding in the postoperative period. Cavernoma should be removed only under the control of the operating microscope and microsurgical instrumentation and microsurgical techniques. Preoperative planning and mapping of functional significant

zones located near the hearth, is the most important part of surgical treatment, as even the slightest error in the direction of entry and angle of attack can lead to disorientation and failure when trying to find a small hearth in the matter of the brain. The most effective method is a combination of the orientation of the available anatomical landmarks and according to the neuronavigation (frame or frameless). It should also be noted that if cavernoma has no exophytic component acting on the surface of the cortex of the brain, problems with the testimony of neuronavigation of the displacement of the cord, you can use intraoperative ultrasonography, as most cavernous angioma well visualized in this type of research.

The use of intraoperative neurophysiological monitoring in surgery of caverna hard to reach locations or functionally important areas helps to minimize the risk of surgical complications and improve outcome. Stem evoked potentials, somatosensory evoked potentials, mapping nuclei of cranial nerves, electromyography and muscle evoked potentials should be in the Arsenal of any neurosurgical clinic and each neurosurgeon, occupying the problem.

Thus it should be noted that the rapid development of neuroimaging techniques and microsurgical techniques have led to increasing interest in vascular diseases of the brain, in particular to the cavernous angioma. Despite the relative rarity of the disease, the number of patients with this disease everywhere increased and the incidence of this disease is increasing every year. Treatment strategy of caverna diverse and depends on many factors, both objective and subjective, so a single algorithm for the management of these patients is still not there.

References

1. Kolyada A.Y., Madias N.E. Transcriptional regulation of the human iNOS gene by IL-1beta in endothelial cells. *Mol. Med.* 2001. Vol. 7. P. 329–343.
2. Matsumura K., Kobayashi S. Signaling the brain in inflammation: the role of endothelial cells. *Front. Biosci.* 2004. Vol. 9. P. 2819–2826.