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Treatment of Patients with a Giant Aneurysm of the Cavernous Part of the Right Internal Carotid Artery by Performing Anextra-Intracranial Micro Anastomosis (Case Report)

Rasulov Sh. O., Ruziqulov M. M., Hazratkulov R. B.
Republican Specialized Scientific Practical Medical Center of Neurosurgery, Tashkent city, Uzbekistan

Abstract: Presented the clinical case of successful extra cranial-intracranial (EC-IC) bypass performance. Female patient, 45 years old, who has been suffered from giant cavernous aneurysm of right internal carotid artery (ICA), presented with mass effect. The EC-IC high-flow bypass using radial artery was performed between M3-M4 segment of right middle cerebral artery and right external carotid artery. Bypass patency was confirmed by intraoperative Doppler ultrasound, postoperative digital subtraction angiography and by ultrasound examination of anastomosis. Patient was discharged in 10th days after operation with satisfactory condition. The EC-IC bypass is one of effective method treatment for aneurysms of cavernous portion of ICA, allowing occluding aneurysm from cerebral blood flow and decreasing its mass effect to adjacent structures.

Keywords: large and giant aneurysms, aneurysm treatment.

Relevance. Giant aneurysms of the cavernous internal carotid artery (ICA) account for 3 to 39% of all cerebral aneurysms of this size [1, 5, 10, 12]. A characteristic feature of these aneurysms is a more favorable course of the disease compared to giant aneurysms located in the subarachnoid space. Up to 40% of these aneurysms are asymptomatic [11]. With symptomatic giant aneurysms, the most characteristic clinical signs are: headache, mainly in the frontal region or in the orbit [1,2,4,10], symptoms of damage to the oculomotor nerves, as well as pain due to compression of the first and second branches of the trigeminal nerve [1 , 4, 7]. In case of rupture of aneurysms of the cavernous part of the ICA, a carotid-cavernous fistulas is most often formed [6,7]. However, observations have been described when the rupture of such aneurysms led to the development of subarachnoid hemorrhage [4, 12] or subdural hematoma [4]. In some cases, such aneurysms manifest themselves as massive nosebleeds (epistaxis) with a probable fatal outcome [1, 7, 8, 10]. The development of deafness [3,5] or impaired secretion of prolactin [1,2,5] is extremely rare.

Since the 80s of the XX century, one of the methods for treating aneurysms of the cavernous ICA, in addition to direct surgical intervention, widely used by V. Dolenc et al . [11], is an extra-intracranial bypass followed by ICA ligation with or without clipping intracranial part of the ICA, proximal to the level of origin of the ophthalmic artery [2, 3, 6, 10]. Recently, with the active development of endovascular surgery, flow guides tents are increasingly used to treat aneurysms of the cavernous portion of the internal carotid artery [8].

In this article, we present an example of an extra-intracranial microanastomosis in a patient

with a giant aneurysm of the cavernous part of the right ICA.

Patient T., 45 years old. According to the patient and relatives, over the past few months, bothered gradually increasing headache, mainly in the right eye, appeared double vision. With the above complaints, she was hospitalized to our clinic for examination and surgical treatment.

Condition upon admission of moderate severity. Neurological examination revealed clear consciousness, no meningeal syndrome. Moderate cerebral symptoms such as headache, mainly in the area of the right eye, paresis of the right abducens nerve. MSCT angiographic examination of the brain revealed a rounded mass effect in the projection of the right ICA (giant aneurysm of the right ICA with deformity of the sellaturcica on the right (Fig. 1). MRI of the brain and MR angiography (see Fig. 2) revealed a giant non-thrombotic aneurysm of the right ICA measuring 30×27×43 mmwith deformity of the sellaturcica and compression of the chiasm. Cerebral angiography confirmed the diagnosis (Fig. 3).

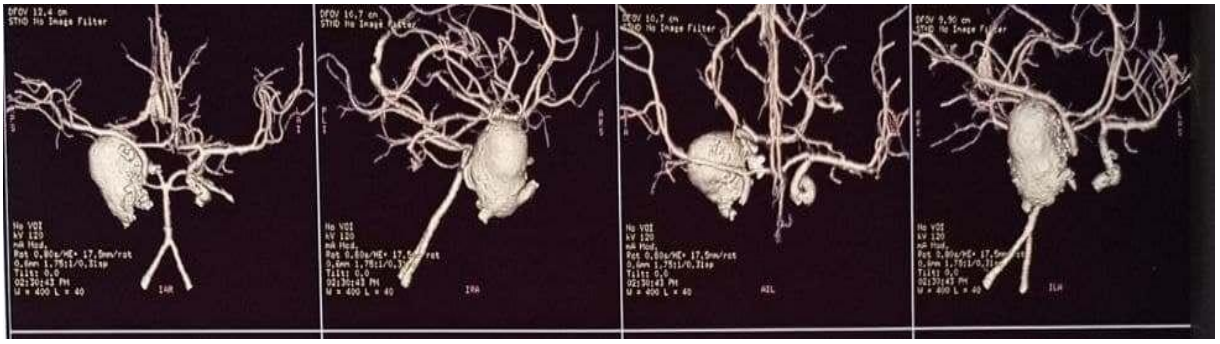

Figure 1. MSCT angiography of the brain. Giant aneurysm in the cavernous part of the ICA.

Figure 2. MRI of the brain. Giant aneurysm of the right ICA measuring 30×27×43 mm with deformity of the sellaturcica and compression of the chiasm.

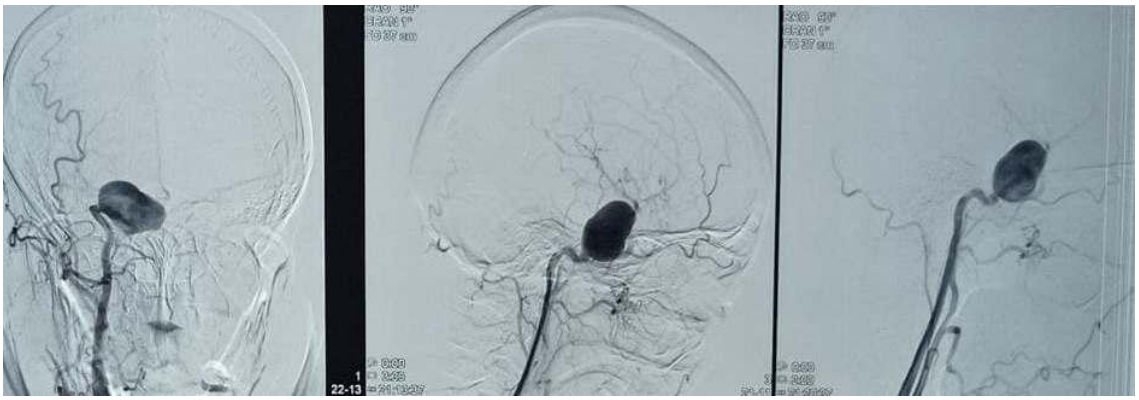

Figure 3. Selective cerebral angiography. Giant saccular aneurysm of the cavernous part of the internal carotid artery on the right

The gigantic aneurysm is located in the cavernous part of the ICA and itssize showsmass effect on the surrounding structures. However, an increase in neurological deficit is not seen and while performing the Matas test changes are absent. Taking into account all the above decidedto perform an extra-intracranial microanastomosis using a section of a branch of the superficial temporal artery, then endovascular deconstructive occlusion of an aneurysm of the right internal carotid artery withmicrocoils.

Treatment. Under general intubation anesthesia, the frontal and parietal branches of the superficial temporal artery were separated. Then performed osteoplastic craniotomy in the right fronto-temporal region. The dura mater (DM) is not tense, distinctly pulsates. After opening the DM over the Sylvain fissure, an approach was made to the M2 segment of the right MCA, it was dissected and mobilized. A micro-anastomosis was performed between the M3-M4 segment of the right MCA and the right ECA, followed by an endovascular deconstructive occlusion of an aneurysm of the right internal carotid artery with detachable microcoils(Fig. 4.).

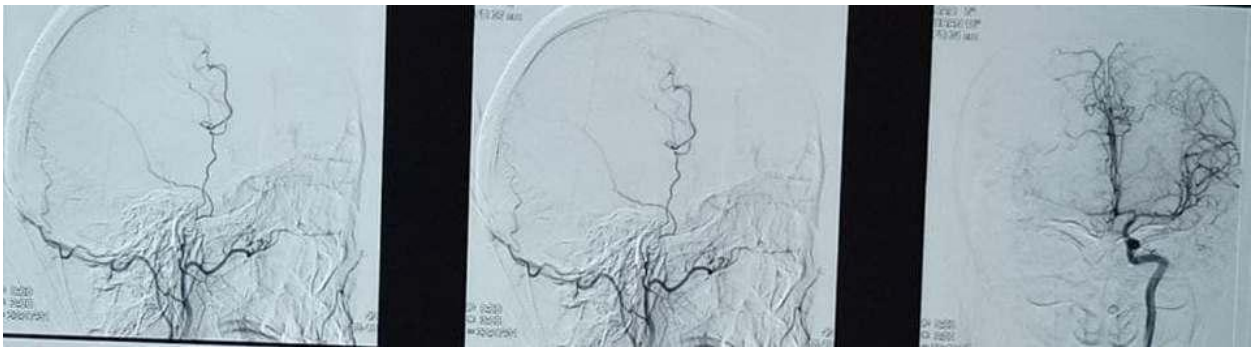

Figure 4. Selective cerebral angiography**.** Condition after endovascular deconstructive occlusion of an aneurysm of the right internal carotid artery with separable microcoils. Control angiography of the right external carotid artery, left ICA, and left vertebral artery showed satisfactory blood supply to the branches of the right MCA and ACA.

After the operation, the patient was taken to the intensive care unit. After the patient came out of drug sedation, her consciousness was clear, meningeal and focal symptoms were not detected.

Discussion. Despite the achievements of modern vascular neurosurgery, the treatment of giant aneurysms is still a difficult task. Although they account for 3–5% in the structure of intracranial aneurysms, the proportion of patients with complex giant and fusiform aneurysms admitted to specialized centers is quite large, and treatment approaches require mastery of the entire arsenal of surgical techniques. This paper describes a clinical example of extra intracranial microanastomosis between the ECA and M3-M4 segment, followed by endovascular deconstructive occlusion of an aneurysm of the right internal carotid artery with detachable microcoils, in order to isolation a giant aneurysm of the cavernous segment of the ICA from the bloodstream.

The decision on surgical intervention in this observation was made in connection with the increasing mass effect of the giant aneurysm on the surrounding brain structures, confirmed by neurological examination (cerebrovascular symptoms, abducens nerve insufficiency) and according to the data of radiation diagnostic methods (chiasm compression, deformity of the sella turcica).

Conclusions. As our observation shows, the operation of extra-intracranial microanastomosis for the treatment of giant aneurysms of the cavernous part of the ICA helps to successfully disconnect the aneurysm from the bloodstream and reduce its mass effect on the surrounding

nerve structures. These operations should be carried out in hospitals, where specialists who know the technique of performing microsurgical vascular operations and in the presence of adequate anesthesia and specialized neurosurgical resuscitation.

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