

Function of oculomotor, trochlear and abducens nerves in patients with cerebral aneurysms undergoing endovascular treatment

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Background. Functional impairment of nerves, which move an eyelid, is a serious problem in patients with aneurysms, especially concerning enlarging number of endovascular procedures on cerebral aneurysms.

Aim. To evaluate frequency of malfunction of oculomotor, trochlear, abducens nerves in patients with cerebral aneurysms.

Methods. From 2019 to 2021 189 patients with 202 aneurysms underwent endovascular treatment. Location of the aneurysms: cavernous, clinoid and communicating segments of the internal carotid arteries, superior cerebellar arteries, P1 and P2 segments of the posterior cerebral arteries. Patients did not have dislocation syndrome as a result of a stroke. There were 37 male patients and 152 female patients. The age of patients ranged from 17 to 78 years, the mean age was 52 ± 12 years. Distribution of aneurysm location: 42 (21%) – cavernous segment of the internal cerebral artery, 25 (12%) – clinoid segment, 110 (55%) – communicating segment, 18 (9%) – superior cerebellar arteries, 7 (3%) – P1 and P2 segments of the posterior cerebral arteries. Morphologically 11 (5%) of the aneurysms were fusiform, 191 (95%) of the aneurysms were saccular. 43 aneurysms (21%) were embolized with coils, 49 (24%) were treated using assisted coiling (balloon- and/or stent-assistance), 83 (42%) of the aneurysms were treated with flow-diverters. 27 (13%) patients underwent several endovascular procedures, including a combination of aforementioned techniques. Function of oculomotor, trochlear and abducens nerves was evaluated at the admission, during the hospitalization and at the discharge. Follow-up was achieved in 102 (54%) patients with 115 aneurysms, the mean follow-up period in June 2022 is 13 months. Checking cerebral angiography was performed 8 months after the operation on the average.

Results. In 89 (77%) patients checking cerebral angiography showed complete obliteration of the aneurysms, in 26 (23%) filling part of the aneurysm was found out to be smaller. 11 patients had preoperative oculomotor nerve paresis, after the procedure 1 patient had no oculomotor nerve impairment and made a complete recovery, 2 patients had partial improvement, 7 patients had no changes, in 1 patient paresis worsened. In our group we did not observe any case of trochlear nerve palsy either prior or after the operation during follow-up. 6 patients had preoperative abducens nerve paresis, after the treatment 1 patients had a complete recovery of abducens nerve function, 3 patients had partial improvement, 2 patients had no changes.

Conclusion. In patients with cerebral aneurysms without cerebral dislocation as result of a stroke function of trochlear nerve did not suffer either prior or after endovascular treatment. Endovascular treatment in this category of patients may positively affect the oculomotor and abducens nerve impairment, but in rare cases it can lead to deterioration of neurological deficit.

Keywords: abducens nerve; cerebral aneurysm; oculomotor nerve; trochlear nerve

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