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Transcatheter laser revascularization of cerebral vessels in the treatment of atherosclerotic lesions accompanied by the development of vascular dementia

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Background: The number of patients suffering from vascular dementia is constantly growing worldwide. This research investigates the effectiveness of the method of brain transcatheter laser revascularization in the treatment of ischemic lesions accompanied by vascular dementia.

Materials & Methods: 1238 patients aged 29-81 (average age 75) suffering from various types of atherosclerotic lesions of cerebral vessels were examined undergoing computed tomography of the brain (CT), magnetic resonance imaging (MRI), scintigraphy of the brain (SG), rheoencephalography (REG), cerebral multi-gated angiography (MUGA), laboratory diagnosis, and assessment of the severity of dementia (CDR), cognitive disorders and everyday life disorders (MMSE), the Barthel index (IB). 730 (58.97%) patients 525 (71.92%) male, 205 (28.08%) female, also had vascular dementia. 698 patients were selected for transcatheter treatment. According to the severity of dementia, the patients were divided into the following groups: CDR-1 - 378 (54.15%) patients; CDR-2 – 209 (29.95%) patients and CDR-3 – 111 (15.90%) patients. For main intracranial arteries revascularization high-energy laser systems were used, for distal intracranial branches revascularization - low-energy ones. Good immediate angiographic outcome manifested in vascular lumen and patency restoration and collateral revascularization was obtained in 715 (97.96%) cases. Clinical outcome depended on severity of dementia and timing of surgery. After the interventional laser treatment, a practically complete restoration of motor functions and intellectual ability, a decline of cognitive disorders to MMSE 27-30, IB 90-100 were considered a distant good clinical outcome; a partial restoration of motor functions and intellectual ability, IB 75 -85 were considered a satisfactory clinical outcome; a partial restoration of motor functions and intellectual ability, IB 60-70 were considered a relatively satisfactory clinical outcome.

Results: In 12 months, various groups of the treated patients demonstrated the following clinical outcome: Good clinical outcome (almost complete reduction of cognitive impairment) in Group CDR-1 was obtained in 306 (80.95%), cases, CDR-2 – 91 (43.54%), CDR-3 – 9 (8.11%). Satisfactory clinical outcome (partial reduction of cognitive impairment) in CDR-1 was obtained in 58 (15.34%), cases, CDR-2 – 69 (33.01%), CDR-3 – 33 (29.73%). Relatively satisfactory clinical outcome (partial reduction of cognitive impairment) in CDR-1 was obtained in 14 (3.70%), cases, CDR-2 – 49 (23.44%), CDR-3 – 69 (62.16%). No negative effect of the transcatheter surgery was observed. It should be noted that the restoration of motor functions went on slower than the restoration of intellectual ability and to a greater degree depended on the size of the post-ischemic cyst and the timing of transcatheter treatment after the stroke.

Conclusions: Vascular dementia mostly develops against the background of distal lesions of intracranial arterial branches. The method of transcatheter laser revascularization of cerebral vessels is an effective interventional method of small traumacy for the treatment of vascular lesions of the brain. It allows restoring the patency and lumen of vessels of various diameters simultaneously causing collateral revascularization of the ischemic area and near located tissue. The effect persists for a long time and promotes regression of vascular dementia greatly improving the patients' quality of life.

Biography

Ivan V Maksimovich, MD, is a ISTAART member, and the Head Physician of Clinic of Cardiovascular Diseases named after Most Holy John Tobolsky (Moscow, Russia) since 1993. One of the major problems the clinic deals with is the diagnosis and treatment of various brain lesions including Alzheimer's disease. For a long time he has fully concerned himself with the diagnosis and treatment of Alzheimer's disease. Over the past 15 years he has published over 60 scientific works on this subject.

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