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A RETROSPECTIVE REVIEW OF THE TREATMENT PERFORMED FOR STENOSING LESIONS OF THE INTERNAL CAROTID ARTERIES, OVER 5 YEARS IN THE CONDITIONS OF JSC NSCS

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Conflict of interest
The authors declare that they have no conflicts of interest

Keywords
atherosclerosis, carotid endarterectomy, carotid artery stenting, ischemic stroke

Abstract

Prevention and treatment of acute disorders of cerebral circulation is the most important medical and social problem, is of great socio-economic importance. For the prevention of ischemic stroke, carotid endarterectomy has been used since 1954 (Eastcott H.H., 1954; DeBakey M.E., 1975), and carotid angioplasty and stenting since the mid-80s. (Kerber R., 1980). Despite a significant number of randomized multicenter comparative studies of the results of carotid endarterectomy and carotid stenting SAPPHIRE, CREST, CARESS, EVA-3S, SPACE, the issue of choosing the optimal method of surgical treatment of patients with carotid artery stenosis is currently not completely resolved. The work is based on the analysis of the results of surgical treatment of 113 patients with stenosis of the carotid arteries who were treated at the A.N. Syzganov from 2015 to June 2020. The patients were divided into two main groups according to the method of treatment. In the group of carotid endarterectomy, operations were performed in 58 patients, in the group of carotid stenting - 55 operations of stenting of the internal carotid artery with cerebral protection in patients. Thus, the statistical analysis included the results of 113 cases of primary surgery. In the conclusion of the work carried out, recommendations were developed for the introduction and selection of tactics for the introduction of patients with cerebrovascular atherosclerosis.

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Түйін сөздер
атеросклероз, каротидтік эндартерэктомия, ұйқы артериясын стенттеу, ишемиялық инсульт

Аңдатпа

Ми қан айналымының жедел бұзылуларының алдын алу және емдеу маңызды әлеуметтік-экономикалық маңызы бар медициналық-әлеуметтік проблема болып табылады. Ишемиялық инсульттің алдын алу үшін 1954 жылдан бастап каротидтік эндартерэктомия (Eastcott H.H., 1954; DeBakey M.E., 1975), ал 80-ші жылдардың ортасынан бастап каротидті ангиопластика және стенттеу қолданылады. (Кербер Р., 1980). SATPHIRE, CREST, CARESS, EVA-3S, SPACE каротидті эндартерэктомия және каротидті стенттеу нәтижелерін рандомизирленген мультиорталықты салыстырмалы зерттеулердің маңызды санына қарамастан, қазіргі уақытта каротид артериясының стенозы бар науқастарды оңтайлы хирургиялық емдеу әдісін таңдау мәселесі толығымен шешілмегені шешілді. Жұмыс тәжірбиесі 2015 жылдан 2020 жылдың маусымына дейін А.Н.Сызғанов атындағы Ұлттық ғылыми хирургия орталығында емделген каротид артерияларының стенозы бар 113 науқастың хирургиялық емдеу нәтижелерін талдауға негізделген. Науқастар емдеу әдісі бойынша екі үлкен топқа бөлінді. Каротидтік эндартерэктомия тобында 58 науқасқа операциялар, каротидті стенттеу тобында - науқастарға мидың қорғанысымен ішкі ұйқы артериясын 55 рет стентациялау операциялары жасалды. Осылайша, статистикалық талдауға алғашқы хирургиялық араласудың 113 жағдайының нәтижелері енгізілді. Жүргізілген жұмыс қорытындысында цереброваскулярлық атеросклерозбен ауыратын науқастарды енгізу тактикасын енгізу және таңдау бойынша ұсыныстар әзірленді.

Ретроспективный обзор проведенного лечения при стенозирующих поражениях внутренних сонных артерий, за 5 лет в условиях АО ННЦХ

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Аннотация

Профилактика и лечение острых нарушений мозгового кровообращения является важнейшей медико-социальной проблемой, имеет большое социально экономическое значение. Для профилактики ишемического инсульта каротидная эндартерэктомия применяется с 1954 года (Eastcott H.H., 1954;DeBakey M.E., 1975), а каротидная ангиопластика и стентирование с середины 80-х гг. (Kerber R., 1980). Несмотря на значительное количество проведенных рандомизированных многоцентровых сравнительных исследований результатов каротидной эндартерэктомии и каротидного стентирования SAPPHIRE, CREST, CARESS, EVA-3S, SPACE – вопрос выбора оптимального метода хирургического лечения больных со стенозами сонных артерий в настоящее время окончательно не решен. В основу работы положен анализ результатов хирургического лечения 113 пациентов со стенозами сонных артерий, проходивших лечение в ННЦХ им. А.Н.Сызганова с 2015 по июнь 2020 года. Пациенты были разделены на две основные группы по методу лечения. В группе каротидной эндартерэктомии выполнено операций у 58 больных, в группе каротидного стентирования – 55 операции стентирования внутренней сонной артерии с церебральной протекцией у больных. Таким образом, в статистический анализ вошли результаты 113 случаев первичных операций. В заключении проведенной работы, были выработаны рекомендации по введению и выборе тактики введения пациентов, с цереброваскулярным атеросклерозом.

Ключевые слова
атеросклероз, каротидная эндартерэктомия, стентирование сонной артерии, ишемический инсульт

Topicality

Prevention and treatment of acute cerebral circulatory disorders is the most important medical and social problem and is of great social and economic importance. Carotid endarterectomy has been used for the prevention of ischemic stroke since 1954 (Eastcott H.H., 1954; DeBakey M.E., 1975), and carotid angioplasty and stenting since the mid-80s (Kerber R., 1980). (Kerber R., 1980) Prospective randomized multicenter NASCET, ECST and ACAS studies demonstrated the long-term effectiveness of carotid endarterectomy (CEE) in symptomatic and asymptomatic patients with severe carotid artery stenosis compared with conservative therapy. Due to these results, CEE has become the operation of choice subject to the standards developed by Stroke Council and American Heart Association in 1989 (Beebe H.G., 1989). These standards define the results, in which surgical treatment for clinically significant atherosclerotic stenoses of the internal carotid artery is in any case preferable for patients than conservative therapy.

Further, in the comparative studies of carotid angioplasty and stenting (CAS) and CEE, the first endovascular interventions on the carotid arteries using stents and protection systems were performed in patients with high risk of surgical treatment, where they proved the advantage over open surgery (Yadav J.S. et al., 2004). However, in the treatment of symptomatic patients, the best treatment results show carotid endarterectomy (Mas al., 2004). And a number of J.L. et researchers found that there are also risk factors for carotid stenting (Biasi G.M. et al., 2004).

Thus, in spite of a significant number of randomized multicenter comparative studies of the results of carotid endarterectomy and carotid stenting SAPPHIRE, CREST, CARESS, EVA-3S, SPACE, the issue of optimal surgical treatment of patients with carotid artery stenosis has not been finally resolved. Stenting is an alternative to endarterectomy for the treatment of carotid stenosis, but its long-term efficacy has not been determined. We present data comparing these treatments: 113 patients with symptomatic carotid stenosis from 2015 to 2020.

Materials and methods

The paper is based on the analysis of the results of surgical treatment of 113 patients with carotid artery stenoses treated at the A.N. Syzganov NSCS. A.N. Syzganov from 2015 to June 2020. The patients were divided into two main groups according to the method of treatment. In the carotid endarterectomy group 58 patients underwent operations, in the carotid stenting group - 55 operations of internal carotid artery stenting with cerebral protection in patients. Thus, the statistical analysis included the results of 113 cases of primary operations.

We applied the following criteria for inclusion of patients in the study.

Presence of carotid artery stenosis over 60% in combination with: previously suffered transient ischemic attacks or amaurosis fugas

Table 1
The ratio of patients in the CEE and CAS group by age, sex, number of main operations

Characteristic	CEE group	CAS group	P
Number of patients	58	55	–
Number of operations, n	58 (100%)	55 (100%)	–
Operations performed in men (%)	51 (87.9%)	50 (90.9%)	
Operations performed on women (%)	7 (12.0%)	5 (9.0%)	
Age, years	–	–	–
Middle $\pm_{M}^{-}$	64,69±6,89	65,20±9,24	0,68
Range, years	49-78	39-82	–
Age up to 75 years	78 (90,7%)	73 (87,9%)	0.62
Age 75 and older (%)	8 (9,3%)	10 (12,1%)	0.62

m – standard deviation

dyscirculatory encephalopathy;

previous ischemic stroke;

presence of embolism-associated ASD;

presence of carotid artery stenosis over 70% in the absence of clinical manifestations of chronic cerebrovascular insufficiency and stable ASD.

Patients with: restenosis after previous carotid endarterectomy or carotid stenting, post-radiation carotid artery stenosis were excluded from the study;

predominant lesions of the vertebro-basilar basin (lesions of the vertebral and subclavian arteries);

previously performed extra-intracranial micro-anastomosis on the side of the occlusion;

severe heart rhythm disorders (atrial fibrillation, atrial fibrillation and ventricular flutter);

Severe respiratory insufficiency;

heart failure III-IV functional class.

Patients with contraindications to one of the treatment methods (acute coronary syndrome, hemodynamically significant tortuosity or kinking of the target carotid artery, pronounced atherosclerotic plaque calcification) were also excluded from the study.

To test the null hypothesis regarding patient homogeneity, we investigated differences in the compared groups by sex, age (Table 1), and concomitant pathology (Table 2) by t-criterion and Chi-square test (x2).

All patients were examined before surgery by neurologist and cardiologist, and if necessary by endocrinologist. The neurological status, the degree of chronic cerebrovascular insufficiency according to the classification of A.V. Pokrovsky (1979), and the severity of concomitant cardiovascular pathology (Table 2).

The Canadian Heart Association classification was used to assess the functional class of angina, the New York Heart Association classification was used for heart failure class, the Fontaine-Pokrovsky classification was used to assess the severity of chronic ischemia of the lower extremities.

Conclusions

1. The incidence and nature of cerebrovascular complications (stroke, transient ischemic attack) and cardiovascular complications (acute coronary syndrome, myocardial infarction) during carotid endarterectomy and carotid stenting in the immediate and long-term postoperative period did not significantly differ (p0,05).

2. For carotid endarterectomy, risk factors for cerebrovascular complications were contralateral occlusion in patients who had had a stroke less than 6 months earlier (p0.05) and age over 75 years in patients who needed a temporary intraluminal shunt (p0.05).

For carotid stenting, risk factors for cerebrovascular complications were hypoechogenic heterogeneous type of atherosclerotic plaque (p0.05) and atherosclerotic plaque surface ulceration (p0.05).

Table 2
Frequency of comorbidities in patients in the CEE and CAS groups

Associated disease	CEE group	CAS group	P
Ischemic heart disease (%)	51 (59,3%)	52 (62,6%)	0,94
FC angina pectoris 1 or 2 (%)	51 (59,3%	52 (62,6%	0,94
FC angina above 3 (%)	15 (17,4%)	21 (25,3%)	0,26
History of myocardial infarction (%)	12 (13,9%)	15 (18,1%)	0,53
Arterial hypertension (%)	58 (100%)	55 (100%)	0.99
Arrhythmias (%)	11 (12,7%)	15 (18,1%) j	0,39
Chronic ischemia of the lower extremities (%)	31 (36,1%)	34 (40,9%)	0,87
Type II diabetes mellitus (%)	12 (13,9%)	10 (12,0%)	0,82

3. A risk factor for the development of cardiovascular complications for carotid endarterectomy is the presence of initial functional class III angina (p0,05). No cardiovascular risk factors were found for carotid stenting.

4. Carotid endarterectomy and carotid stenting are effective methods for prevention and treatment of cerebral circulatory disorders in patients with carotid artery stenosis, and treatment results over 36 months do not differ significantly (p0,05).

5. Optimal conditions for carotid endarterectomy should be considered: in patients with previous stroke and carotid artery occlusion - more than 6 months after the previous stroke (late recovery period); in patients who require the use of a temporary internal shunt - age no older than 75 years; in patients with cardiac pathology - initial angina pectoris with functional class II or higher.

6. Optimal conditions for carotid stenting are an isoechogenic, homogeneous or heterogeneous hyperechogenic atherosclerotic plaque without surface ulceration.

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