

## КЛЕТОЧНЫЕ ТЕХНОЛОГИИ И РЕГЕНЕРАТИВНАЯ МЕДИЦИНА

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### EXPERIENCE OF STAGED HYBRID REVASCULARIZATION IN AN ELDERLY PATIENT WITH GENERALIZED ATHEROSCLEROSIS

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#### XULOSA

**Maqsad.** Ushbu maqolaning maqsadi umumiy aterosklerozli keksa bemorni davolashda bosqichli gibridd revaskulyarizatsiya yondashuvidan foydalanishning klinik tajribasi va natijalarini taqdim etish va muhokama qilishdir.

**Materiallar va usullar.** Ateroskleroz bilan og'riqan bemorlar. Klinik va instrumental tekshiruv (ultratovush, angiografiya EKG), laboratoriya tekshiruvlari (to'liq qon ro'yxati, siydik) va biokimyoviy qon testlarini o'z ichiga oladi.

**Natijalar.** Ushbu klinik misol asta-sekin kundalik tibbiy amaliyotning bir qismiga aylanib borayotgan hujayra texnologiyasidan foydalangan holda umumiy aterosklerozli bemorda gibridd revaskulyarizatsiyaning mumkin bo'lgan variantlaridan birini namoyish etdi.

**Kalit so'zlar:** umumiy ateroskleroz, gibridd aralashuv, stentlash, bypass operatsiyasi, keksa bemorlar.

Atherosclerosis is considered to be a multifocal disease, which is based on disturbances in biochemical, immunological and molecular genetic processes [1], usually affecting several arterial beds, and which can manifest itself both asymptotically and clinically [19]. Atherosclerotic lesions of the aorta are most often observed, then the main arteries of the lower extremities, branches of the aortic arch, coronary and visceral arteries. Damage to two or more arterial territories occurs in more than 65% of patients, especially in the elderly and senile. It is well known that damage to several arterial territories is accompanied by a rather low long-term survival rate, for example, the 5-year life expectancy of patients with coronary atherosclerosis is 70%, for patients with damage to only the carotid arteries - about 80%, for patients with obliterating atherosclerosis of the lower extremities - 80%, and with damage to several arterial territories, this figure does not exceed 50% [9,16,19].

According to summary statistics, the incidence of multifocal atherosclerosis is 18–54% [3,4,5,7,10].

#### РЕЗЮМЕ

**Цель.** Целью данной статьи является представить и обсудить клинический опыт и результаты применения поэтапной гибридной реваскуляризации в лечении пожилого пациента с генерализованным атеросклерозом.

**Материалы и методы.** Пациенты с атеросклерозом. Клиническое обследование пациентов по месту госпитализации включало клинико-инструментальное обследование (УЗИ сердца, ангиография, ЭКГ) и лабораторные исследования (общий анализ крови, мочи), биохимические анализы крови.

**Результаты.** Данный клинический пример продемонстрировал один из возможных вариантов гибридной реваскуляризации у пациента с генерализованным атеросклерозом с использованием различных методов, включая клеточные технологии, которые постепенно становятся частью повседневной медицинской практики.

**Ключевые слова:** генерализованный атеросклероз, гибридное вмешательство, стентирование, шунтирование, пациенты пожилого возраста.

Combined damage to various vascular areas is more common in elderly and senile people [7,10].

We present our experience in the staged treatment of a patient with generalized atherosclerosis: damage to the coronary, renal, brachiocephalic arteries and arteries of the lower extremities, which, according to world literature, occurs in 1.5–10% of cases [4,11,12].

Patient E., 73 years old, came to the clinic with complaints of pressing pain in the chest during moderate physical activity (walking on a flat surface up to 100 m), and periodic increases in blood pressure. From the anamnesis it is known that angina pectoris first appeared in 2004, at the same time an increase in blood pressure to 170 mm Hg was detected. Art., was treated conservatively with a satisfactory effect, a significant deterioration in health has been noted in the last 6 months. The patient has been suffering from type 2 diabetes mellitus in a compensated form for several years. According to the laboratory, the initial creatinine level was 72  $\mu\text{mol/L}$ .

Angiographic examination diagnosed:

- stenosis of the trunk of the left coronary artery in the distal third – 70%;
- stenosis of the anterior interventricular artery at the mouth – up to 70%;
- stenosis of the circumflex artery at the mouth 80%, in the proximal third – 90%;
- occlusion of the right coronary artery from the mouth, filling the periphery from the basin of the left coronary artery; – stenosis of the mouth of the right renal artery – 80%;
- stenosis of the mouth of the left renal artery – 90%;
- stenosis of the right internal carotid artery at the mouth – 80%;
- stenosis of the right common iliac artery – 70%, occlusion of the arteries of the leg;
- stenosis of the left common iliac artery – 80%;
- stenosis of the left superficial femoral artery – 80% in the proximal third, occlusion at the border of the middle and lower third to the popliteal artery, occlusion of the arteries of the leg.

Considering the severity of the coronary lesion involving the trunk of the left coronary artery (SYNTAX Score – 35 points), the patient was recommended to undergo coronary artery bypass grafting. Since the operation was planned with the possible use of artificial circulation in order to avoid intraoperative renal ischemia [13], the first stage was stenting of the renal arteries on both sides [17] with a satisfactory angiographic and clinical effect and a decrease in blood pressure to 125–140/70–90 mm Hg . Art.

3 months after discontinuation of Plavix, a simultaneous operation was performed as planned: coronary artery bypass surgery, carotid endarterectomy on the right. The operation was complicated by acute cerebrovascular accident in the territory of the right middle cerebral artery with insignificant clinical manifestations.

After 4 months, bilateral stenting of the common iliac arteries was performed; after 1 month – balloon angioplasty of the proximal part of the left superficial femoral artery and stem cell therapy using the following method. Under spinal anesthesia, a trephine biopsy was performed along the iliac crest, bone marrow was aspirated in a volume of 400–600 ml, and mononuclear cells in a volume of 45–55 ml were obtained by its separation. Cellular material is injected into points on the surface of the leg and foot (intramuscularly - up to 60 points), one injection per 4 cm<sup>2</sup> of the surface of the limb, 1 ml to a depth of 2–2.5 cm. The remaining amount of mononuclear cells is injected intravenously. At the end of the manipulation, an aseptic bandage is applied to the injection area. The patient is discharged the next day.

Control angiography of the lower extremities 6 months after treatment shows a clear positive dynamics of revascularization of the lower extremities after treatment: stents in the iliac arteries are patent, the left superficial femoral artery is stenotic in the proximal third by 70%, occluded in the distal third; arteries of the leg on the right: the peroneal artery is suboccluded in the

proximal third, the posterior tibial artery is suboccluded in the proximal third, the anterior one is suboccluded in the proximal third, the arteries of the leg on the left: the peroneal artery is stenosis in the proximal third 70%, the posterior tibial artery is occluded in the proximal third (filled through collaterals, distal-main blood flow), anterior tibial - occlusion in the proximal third.

After treatment, the patient notes a significant improvement in well-being and quality of life: increased tolerance to physical activity, normalization of blood pressure, increased level of psycho-emotional background. Currently, the patient is under dynamic medical supervision. Doesn't actively complain. Complex drug therapy continues as planned, maintaining the target LDL value of less than 2 mmol/l.

**In conclusion:** This clinical example demonstrates one of the possible options for hybrid revascularization in a patient with generalized atherosclerosis using various methods, including cell technology, which is gradually becoming part of everyday medical practice [8,15]. Despite the increase in the number of such patients, there is still little experience in their treatment. Specific algorithms of action have not been developed for various combinations of arterial lesions, there is no convincing data on the possible simultaneous performance of endovascular and open surgical interventions, or their implementation against the background of dual antiplatelet therapy. It should be noted that carotid endarterectomy in this patient was complicated by ischemic stroke, which could have been avoided with carotid artery stenting at the first stage, as recommended by many authors [14,18,20,21].

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