

A CLINICAL CASE OF ENDOVASCULAR TREATMENT OF THE PATIENT WITH CHRONIC ARTERIAL INSUFFICIENCY OF THE BRAIN WITH CRITICAL ISCHEMIA OF LOWER EXTREMITIES

Sakhiba Kamilova
e-mail: sahibak@mail.ru.

*JSC "Republican Specialized Scientific –
Practical Medical Center of Therapy and Medical Rehabilitation"
* Tashkent Pediatric Medical Institute Tashkent, Uzbekistan*

Abstract: *The article describes the case of one-stage stenting of the internal carotid artery and balloon angioplasty of the tibial arteries in a patient with multifocal atherosclerosis.*

Keywords: *stenosis, stenting, atherosclerosis, carotid arteries, intermittent claudication.*

Introduction. Atherosclerotic lesions are treatable both by shunt and endovascular, which includes transluminal or subintimal angioplasty with stenting. Hybrid technology is sometimes used, but the choice of tactics is determined individually [1].

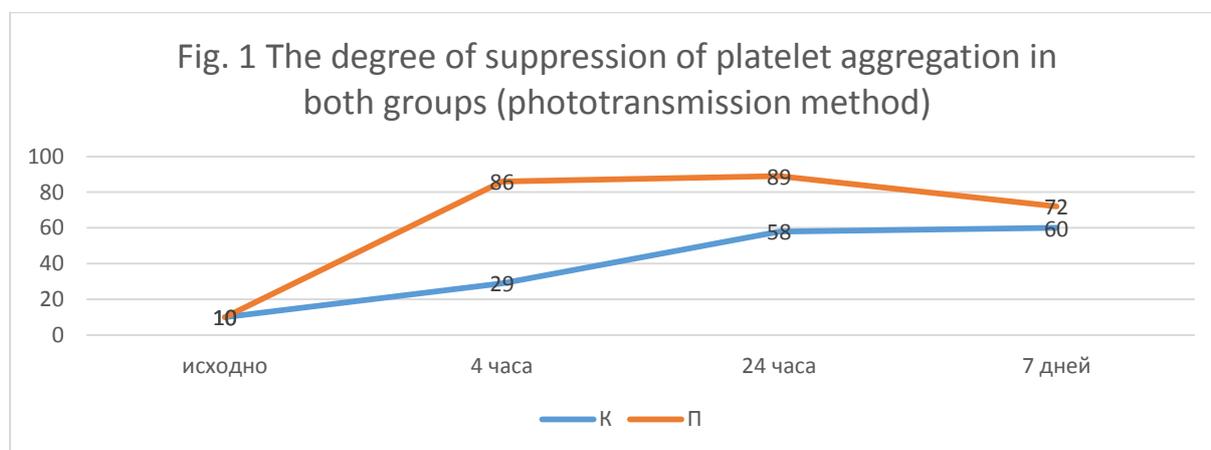
Patients receiving advanced antiplatelet agents, periprocedural antithrombin therapy and next-generation drug-eluting stents (DES) have excellent short- and medium-term results [2]. However, in 20-30% of patients, these methods are ineffective, and limb amputation remains the only acceptable option [3]. In the presence of critical lower limb ischemia in combination with ICA stenosis, there is an additional intraoperative risk of an adverse event, which severely limits the use of open surgery.

The minimally invasive and low-invasiveness of endovascular methods allows for quick and effective restoration of blood flow to ischemic tissue, regardless of the location of the affected area of the arterial bed.

This clinical example describes the technique of simultaneous endovascular treatment of carotid and tibial arterial pools in a symptomatic patient with critical lower limb ischemia.

Patient A., 65 years old, was hospitalized in the Department of Interventional Cardiology of the Republican Specialized Scientific and Practical Medical Center for Therapy and Rehabilitation JSC with complaints of resting pain in the lower extremities (more to the right). A detailed questioning, in addition to these complaints, revealed the presence of a previous cerebrovascular accident in the form of moderate left-sided hemiparesis. Upon admission, the patient underwent a duplex scan of the carotid arteries and arteries of both lower extremities, where hemodynamically significant stomatal stenosis (80%) of the right internal carotid artery (rICA) and multiple critical stenoses on the verge of occlusion of the anterior tibial (ATA) and posterior tibial arteries were revealed (PTA). The linear velocity data of these basins are described below (Table 1.2). Preparation for stenting requires the appointment of double antiplatelet therapy with acetylsalicylic acid 100 mg / day and the drug of the thienopyridine group of clopidogrel (loading dose of 600 mg / day with a transfer to the maintenance dose of 75 mg / day). However, as a result of examining the

patient's blood on an LA 230 platelet aggregation analyzer for clopidogrel resistance, it was found that ADP-dependent platelet aggregation is suppressed to a minimum, which in turn leads to the development of resistance and an increased risk of early thrombotic complications. Clopidogrel (K) was replaced by a new thienopyridine antiplatelet agent - prasugrel (P). Its effect occurs earlier and is more pronounced than that of clopidogrel. Prasugrel administration schedule: loading dose of 60 mg with a transition to a maintenance dose of 10 mg / day. The results of the study showed that, 4 hours after taking loading doses in group P, there was a significant decrease in platelet aggregation activity compared to that of group K (88.7% and 28.5%, respectively, $p < 0.0001$). After 24 hours, while taking already supporting doses of clopidogrel and prasugrel, the aggregation ability in group K decreased to 57.8%, and in group P, the degree of suppression of aggregation reached 89.9% ($p < 0.0001$). After 7 days, against the background of taking maintenance doses of thienoperidines in both groups, there was some leveling of aggregation suppression indicators, but with a significantly more significant effect in group P (72.8% versus 60.8%, $p < 0.0001$) (Fig. 1).



The results of general clinical and biochemical blood tests (Table 3) and ultrasound dopplerography data (Tables 1 and 2) are presented below.

Table 1. The results of the analysis of linear blood flow velocities of the carotid arteries (initial).

| | Right | | | Left | | |
|-----|-------|------|-------|------|------|-------|
| | Vmax | RI | d, мм | Vmax | RI | d, мм |
| CCA | 0,41 | 0,80 | 6,2 | 0,4 | 0,77 | 6,1 |
| ICA | 2,5 | 0,65 | 1,4 | 0,45 | 0,66 | 4,0 |
| ECA | 0,51 | 0,77 | 3,4 | 0,56 | 0,90 | 3,3 |

Table 2. Ankle-brachial index (ABI) of the tibial arteries (initial).

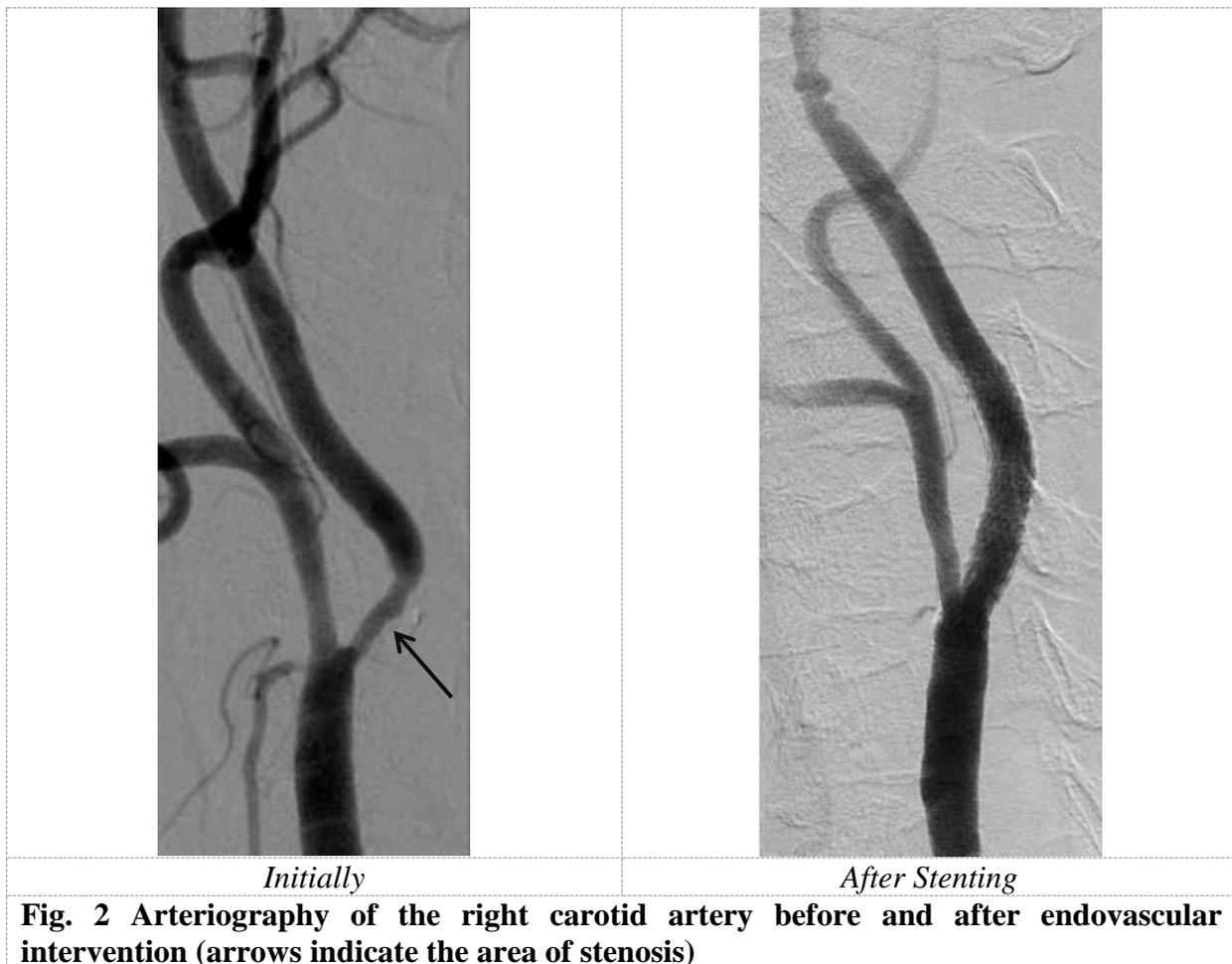
| | Right | | Left | |
|-----|-------|------|------|------|
| | PTA | ATA | PTA | ATA |
| ABI | 0,41 | 0,38 | 0,78 | 0,85 |

Table 3. The results of the blood test at admission

| Name | Results |
|-----------------------|---------|
| Blood sugar, mmol / l | 5,2 |

| | |
|-----------------------------|------|
| Glycated HB,% | 6,5 |
| Alt, mmol / l | 35,6 |
| Ast, mmol / l | 21,2 |
| Creatinine mmol / L | 120 |
| Urea, mmol / L | 6,9 |
| Total cholesterol, mmol / l | 4,7 |
| LDL, mmol / l | 4,8 |
| HDL, mmol / l | 1,1 |
| TG, mmol / l | 1,9 |

Considering the above, it was decided to stent the right ICA with transluminal balloon angioplasty of the tibial arteries of the right lower limb. Retrograde left femoral access puncture a. femoralis communis with installation of 6F introducer. After the insertion of the guide-introducer into the lumen of the right CCA, a distal protection system with the subsequent implantation of a self-expanding stent 6.0x9.0x30 was performed through the stenosis of rICA. Before completion of the procedure, post-dilatation of residual stenosis was performed. On the control angiograms there are no signs of distal embolization, the neurological symptoms of the patient are unchanged. The initial carotidography and stenting results are shown below (Fig. 1)



The following puncture was performed on the right a. femoralis communis in the antegrade direction with the installation of a 6F introducer. A multifunctional diagnostic

catheter 5F was performed below the popliteal segment before tibial artery bifurcation. A 3.0x100 balloon catheter with dilatation along the entire length was delivered to the coronary conductor in the zone of stenosis of the ATA. The exposure time of the balloon is 5-7min. Similar actions were implemented in the PTA. On the control arteriograms, the restoration of the main contrast of ATA and PTA was noted (Fig. 2).



Manual hemostasis was performed with a pressure bandage on the puncture area on both sides. After 1 day, there was a positive trend according to the data of ultrasound dopplerography (table. 4,5).

Table 4. Results of analysis of linear blood flow velocities of the right ICA (after stenting).

| | Right | | | Left | | |
|-----|-------|------|-------|------|------|-------|
| | Vmax | RI | d, MM | Vmax | RI | d, MM |
| ICA | 0,41 | 0,68 | 4,2 | 0,45 | 0,66 | 4,0 |

Table 5. Ankle-brachial index (ABI) of the tibial arteries of the right lower limb (after balloon angioplasty).

| | Right | |
|-----|-------|------|
| | PTA | ATA |
| ABI | 0,79 | 0,82 |

On the 2nd day, the physical activity of the patient was resumed. Neurological deficit is not observed. The resting pains were stopped, the skin was warm to the touch, the color of the foot was normal, pulsation along the main arteries of the foot (a.dorsalis pedis et tibialis posterior) was observed. The patient was discharged in satisfactory condition. The necessary recommendations for further treatment are given.

This clinical case describes well the modern possibilities of endovascular intervention, which allows performing complex diagnostic and therapeutic procedures in almost any clinically dependent vessel in patients with combined pathology.

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