THE FIRST EXPERIENCE OF BALLOON ANGIOPLASTY AND INTERNAL CAROTID ARTERY STENTING IN UZBEKISTAN

The first experience of balloon angioplasty and internal carotid artery stenting in Uzbekistan

The problem of ischemic stroke treatment remains as one of the most topical. Recanalization appears the most reasonable and effective in the treatment and prevention of ischemic stroke. The article presents the first experience of angioplasty and stenting of internal carotid artery in Uzbekistan. Results of colored duplex scanning, multislice computed tomography, extra- and intracranial arteries angiography are described in details. Obtained results showed high efficacy of internal carotid artery stenting.

**Keywords:** Balloon angioplasty, carotid artery, multislice computer tomography, stenosis.

**UDC** 616.133-089.87

**Introduction**

Treatment of ischemic stroke remains one of the most urgent problems in medical practice. In the treatment and prevention of ischemic stroke recanalization strategy is the most substantiated and efficient one. Successful endovascular surgeries of extra- and intracranial arteries as well as introduction of the methods into routine medical practice is widely reported in the literature worldwide (Alekyan et al., 2001; Al-Mubarak et al., 2001; Henry et al., 2001; Reimers et. al., 2002; Roubin et al., 2001). However, domestic literature has less information on this issue. Meanwhile, a progress of modern intervention radiology technologies enhance the role of endovascular methods in surgery for the cerebral vascular pathology.

**Clinical case**


**Complaints at admission**

Headache, weakness and dumbness in the left side extremities, high blood pressure.

**Case history**

Having suffered from arterial hypertension for a long time the patient takes anti-hypertensive drugs irregularly. Within last 3 months several episodes of transient ischemic attacks with 30-40-minute periods of weakness and dumbness in left extremities took place, self-regressing afterwards. The condition worsened on 09.11.2009, weakness and dumbness in left side extremities recurring. The patient was hospitalized at the Republican Research Center of Emergency Medicine (Uzbekistan).

**Status presence**

At the admission the patient’s general condition was of moderate severity. Body constitution was normal and normosthenic. Skin had usual color, no edemas presence. There were no deformities in osteomuscular articular system. Chest had cylindrical shape. Respiration was vesicular and spontaneous with rate of 20 breaths per minute, weakened in the lower lung fields, dry dissipated rale being heard. Vesicular resonance could be heard. Heart boarders were slightly expanded to the left up to the medioclavicular line. Cardiac sounds were rhythmic, blood pressure: 140/90 mm Hg,

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1 Special thanks to Professor Belenkiy A. (I. Rabin Medical Center, Tel Aviv, Israel) for his help in arrangement and performing of the first balloon angioplasty and internal carotid artery stenting in Uzbekistan.
pulse: 76 beats per minute. Peripheral arteries pulsation was satisfactory with good filling. Tongue was clear and moist. Abdomen in palpation was soft and painless. The liver and the spleen were not enlarged, peristalsis being defined. No abnormalities in the kidney area were observed. Urination was free and painless. Diuresis was adequate. Stool was regular.

**Neurological status**

Consciousness of patient was clear. Meningeal signs, such as Kernig’s sign and Brudsinski’s sign, as well as rigidity of occipital muscles were negative. Craniocebral nerves: 1st pair: no olfactory disorders were registered; smells were differentiated. 2nd pair: no visual acuity disorders; unrestricted visual field. 3rd, 4th, 6th: unrestricted eyeball movements; there were no registered diplopia, strabismus, nystagmus, ptosis. Both direct and concord response of pupils to the light were preserved. 5th pair: no disorders in facial skin and mucous membrane sensitivity; preserved sensitivity in the front 2/3 parts of tongue; conjunctive and corneal reflexes were normal; atrophies of chasers were unrevealed. 7th pair: central paresis of left facial nerve. 8th pair: no disorders in hearing acuity; no registered nystagmus and dizziness. 9th and 10th pairs: soft palate was moveable, clear voice; preserved pharyngeal reflex and sensitivity of the posterior one-third of tongue. 11th pair: function of sternocleidomastoideus and trapezoid muscles was preserved. 12th pair: left side deviation of tongue. Sensitivity: left side hemihypesthesia was present. Movement: left side hemiparesis was present. Myodynamia scored 1-2. Tendinous reflexes were equal on both sides. Positive pathological reflex of Babinsky was present. Normal function of pelvis organs was registered. Speech was preserved.

3-hour regress in heparesis and sensitive disorders indicated on reversible acute cerebral circulation disturbance. Thus, transient ischemic attack in the right carotid system was diagnosed.

**Multislice computed tomography (MSCT) findings**

No signs of acute cerebral circulation at the moment of investigation were found.

**Colored duplex scanning findings**

Ultrasonically registered signs of atherosclerotic process in carotid arteries, hemodynamically significant stenosis of right A. carotis communis (right common carotid artery) and A. carotis interna (internal carotid artery) (72% in diameter) bifurcation were present. Ultrasound morphology findings: prolonged heterogeneous atherosclerotic plaque with the zone of hypoechogenicity on the back wall of the internal carotid artery (episode of material embolism is possible) with rough contours was found. Unstable blood flow in V1-V2 segments of vertebral arteries was registered.

**Multislice computed tomography angiography (MSCTA) findings in cerebral extra- and intracranial arteries**

In the left internal carotid artery a kink with a 70-degree bend was observed. A mixed atherosclerotic plaque was seen in the projection of posterior wall of the right internal carotid artery mouth causing stenosis of lumen for 65% in diameter or 87% in area. In projection of the internal carotid artery there were siphon circular calcified atherosclerotic plaques causing stenosis of lumen for 55% in diameter and 75% in area in the right artery; 60% in diameter and 80% in area in the left one.

**Conclusion**

MSCTA findings indicated on atherosclerosis of extra- and intracranial arteries and critical stenosis of the right internal carotid artery mouth. The patient was diagnosed with recurrent transient ischemic attack in right carotid artery, atherosclerosis of cerebral (brain) vessels and hemodynamically significant stenosis of right internal carotid artery. 3rd degree degree arterial hypertension with cardiac and cerebral injures.

**Selective angiography of right common carotid artery**

Following preparation of surgical area and anesthesia of femoral triangle with 10 ml of 2% novocaïn solution puncture of the femoral artery (D) was attempted to perform. Introducer 8F
(Balton) was inserted into the vessel lumen. Catheter CEREBRAL 5 fr was introduced into the aorta through introducer, mouth of the right common carotid artery was selectively catheterized. 5 series of DCA in different projections (extra- and intracranial parts) were performed. Angiograms demonstrated stenosis of proximal segment (85%) of right internal carotid artery with signs of the atherosclerotic plaque ulceration (Figure 1a). The was made a decision about balloon angioplasty and stenting of the stenosis zone with a protective device.

**Balloon angioplasty and stenting of the internal carotid artery**

The diagnostic catheter was substituted by catheter Judkins Right 8 Fr. The latter was inserted into the right internal carotid artery (Figure 1b). Heparin (5000 U) was intravenously injected. Protecting device Spider FX EV 3.0 mm. was positioned in the petrosal part of the internal carotid artery (Figure 1c). 10-second predilatation was performed by means of a balloon-catheter Friderik 3 x 15 Balton under pressure of 10 атмосфер.

![Figure 1. Contrast angiography](image)

**Figure 1. Contrast angiography**

- a. Right carotid basin. Side projection
- b. Insertion of microguide behind stenosis zone
- c. Inserting of emboli "catcher" behind stenosis zone

Self-expanding stent Protégé RX Tapered EV 6-8 x 40 was positioned in the stenosis zone (Figure 2a). Due to 35% residual stenosis postdilatation with balloon-catheter 6 x 40 was performed (Figure 2b). Post-stenting angiograms demonstrated residual stenosis with no thromboembolic complications.

![Figure 2. Stent deployment](image)

**Figure 2. Stent deployment**

- a. Stent insertion
- b. Inserted and spread stent
Analysis of angiograms after stenting demonstrated restoration of blood flow in the right internal carotid artery (Figure 3). Post-operative patient’s condition was stable. No neurological deficiency was found in neurological status.

**Colored duplex scanning findings**

Stent was fully spread; blood flow in the internal carotid artery was laminar with maximum velocity 62.1 sm/sec (RI 0.59)

Post-stenting neurological status was stable. No signs of neurological deficiency were registered.

All the findings demonstrated high efficacy of the internal carotid artery stenting. Today the procedure can be an alternative to carotid endarterectomy.

**References**


