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Abstracts of the Third Russian Congress of Interventional Cardioangiologology (Russia, Moscow, March 24-26, 2008)

POSSIBILITIES OF HELICAL COMPUTED TOMOGRAPHY (HCT) IN THE EVALUATION OF LONG-TERM FOLLOW-UP OF STENTING OF THE LEFT MAIN CORONARY ARTERY (LCA)

N.N. Abramova, V.V. Chestukhin, B.L. Mironkov,
R.S. Muslimov, A.A. Pokatilov (Moscow)

Study objectives: to evaluate the capabilities of reliable estimation of condition of left main coronary artery stenting using HCT-angiography.

Materials and methods: we have studied 12 patients, 4 women and 8 men, 6-24 months (mean 12.4 months) after angioplasty and stenting of the left main coronary artery. Mean age of the patients was 58.6 years.

The study were carried out using 64-section spiral computer tomography «Somatom Sensation-64» (Siemens). Nonionic iodine-containing contrast medium (content of iodine at least 350 mg/ml) was injected into the ulnar vein.

100 ml of contrast medium (content of iodine 350 mg/ml) was infused intravenously by injector with bolus ejection rate of 5.0 ml/sec under cardiac gating. The optimal heart rate did not exceed 75 bpm. Scanning was performed during breath-holding pause of 9-10 sec. duration.

Retrospective analysis was applied to the diastolic phase of cardiac cycle (from 55% to 75%).

Three-dimensional multiplane reconstruction (MPR, MIP, VRT) was used

Besides, the program (Argus) for the calculation of volumetric indices of left and right ventricles, myocardial contractility, myocardial mass and systolic wall thickening was used as necessary.

Results: Coronary arteries imaging, including the stented segments, was optimal in all cases. The in-stent restenosis wasn't revealed. One significant stenosis outside of the stent (in the LAD) was detected.

Conclusions: HCT assessment of stent location in the coronary artery is a sufficiently informative and reliable method, providing the stent diameter is not less than 3.0 mm.

IMMEDIATE AND LONG-TERM FOLLOW-UP OF ENDOVASCULAR GRAFTING OF THE AORTIC ANEURYSMS

S.A. Abugov, M.V. Puretzky, Yu.M. Saakian,
R.S. Poliakov, S.A. Davydov, Yu.V. Belov (Moscow)

Materials and methods. Since 2003 in Russian Research Centre of Surgery endovascular grafting of thoracic and abdominal aorta aneurysm was

performed in 37 patients. Twenty-nine patients underwent the grafting of abdominal aorta aneurysm, 8 – of thoracic aorta. The age of patients varied from 49 to 83 (mean, 61.3 ± 4.7 years). Associated lesions (coronary heart disease, cerebral atherosclerosis, obliterative arteriosclerosis of lower extremities, diabetes mellitus) were present in all patients.

Endovascular prostheses Talent and Valiant (Medtronic, USA) were implanted to all patients. The stents were implanted through the femoral approach.

Results and conclusions. Immediately after the procedure type I blood leakage into aneurysm cavity was seen in 1 patient, type II leakage – in 2 patients, type III leakage – in 2 patients. In one case we revealed the thrombosis of endoprosthesis branch (2.7%).

Control study including US and CT were completed in the long-term follow-up in all patients. Good results were obtained in all cases. Dislocations or kinking of the grafts weren't registered.

Thrombosis of aneurysm without blood leakage developed in all patients with blood leakage type II and III. Repeated replacement in a year was performed in 1 case with blood leakage type I.

Endovascular grafting of the aortic aneurysm is a highly effective and non-traumatic procedure giving good short-term and long-term results in high-risk patients.

ROUTINE MONITORING OF ADP-INDUCED PLATELET AGGREGATION REDUCES THE RISK OF SUBACUTE IN-STENT THROMBOSIS DEVELOPMENT IN PATIENTS WITH CHD WAITING FOR ELECTIVE CORONARY ANGIOPLASTY

S.A. Abugov, R.S. Poljakov, J.M. Saakjan, M.V. Puretsky (Moscow)

Combined double therapy with acetylsalicylic acid and klopidogrel is one of key factors for the prevention of in-stent thrombosis in immediate and long-term period after coronary angioplasty in patients with CHD. Currently more than 30% of patients have partial or full resistance to anti-aggregant therapy.

Current national and foreign guidelines contains no recommendations concerning routine monitoring of platelets aggregation capacity. However the detection of such "potentially high risk patients" is important as it allows for timely correction of anti-aggregant therapy and the reduction of the risk of in-stent thrombosis.

Study objectives consisted in the development and introduction of guidelines for routine measurement of the ADP-induced platelet aggregation in patients waiting for elective coronary angioplasty with evaluation of immediate and long-term results.

Materials and methods. The prospective observation comprised 247 patients in whom coronary stenting was planned. Standard antiaggregant therapy (100 mg of aspirin per day, loading dose of clopidogrel 300 mg with subsequent intake of 75 mg per day for 3-5 days before coronary angioplasty) was given to all patients before coronary angioplasty. Analyze of platelets aggregation capacity was performed in all patients. The decrease of amplitude and velocity of platelet aggregation more than on 30% from reference values was considered an adequate response to antiaggregation therapy. In case of resistance detection Aspirin and Plavix dosages were corrected up to 300 and 150-300 mg per day, respectively. Coronary angioplasty was performed after achievement of target platelet aggregation values

Results. In 69 cases (27.9%) total or partial resistance to initial antiaggregant therapy was revealed. Target values of platelet aggregation capacity were achieved by increasing the doses of Aspirin and Plavix in all therapy-resistant patients. No cases of subacute in-stent thrombosis or massive/small bleedings were registered in the immediate postprocedural period in all followed patients.

Conclusions. The received data allow to expect that routine control of platelet aggregation capacity and current modifications of antiaggregant therapy can decrease the risk of in-stent thrombosis after coronary angioplasty.

COMPARISON OF IMMEDIATE AND LONG-TERM FOLLOW-UP OF CORONARY STENTING AND CORONARY BYPASS GRAFTING IN CAD PATIENTS WITH MULTI-VESSEL CORONARY LESIONS

S.A. Abugov, R.S. Poliakov, Yu.M. Saakian, M.V. Puretzky, I.B. Zhbanov (Moscow)

Study objective: Comparison of immediate and long-term results of coronary stenting and coronary bypass grafting in patients with CHD with multi-vessel coronary lesions.

Materials and methods: 219 patients with multi-vessel coronary lesions were divided into 2 groups depending of the revascularization method. First group (coronary stenting, CS) comprised 102 patients, second group (coronary bypass, CB) – 117 patients. Clinical and angiographic characteristics were comparable in both groups. In-hospital and late mortality, unfavorable cardiac and cerebrovascular events were evaluated.

Results: Hospital mortality in CS and CB groups was 0.9% and 1.7% ($p>0.05$), respectively, myocardial infarction developed in 0.9% and 2.6%

($p>0.05$), cerebrovascular lesions – in 0% and 0.9%, ($p>0.05$). In the long-term follow-up (21 months) the survival was 97.1% and 96.6% ($p>0.05$), repeated revascularization was performed in 1.8% and 6.8%, respectively ($p>0.05$), combined index of death/MI/ repeated revascularization/ cerebrovascular lesions was 14.6% and 13.7% ($p>0.05$), respectively.

Conclusion: immediate and long-term results of coronary stenting in patients with CHD with multi-vessel coronary lesions are not inferior as compared to those of coronary bypass grafting.

CLINICAL AND EXPERIMENTAL CELL METHODS IN TREATMENT OF HEART FAILURE

Sh.D. Ahmedov, V.E. Babokin, S.I. Sazonova, V.I. Chernov, I.L. Bukhovets, I.N. Vorozhtsova, M.L. Djakova, I.V. Kistineva, V.M. Shipulin (Tomsk)

Every year over 1 million of people in Russia die from cardiovascular diseases. Such high mortality is associated with heart failure, and, despite the successes achieved in its treatment, some problems are still unsolved. The effectiveness of surgical treatment of heart failure is based on the complex of medical procedures aimed at the improvement of intracardiac hemodynamics, prevention of further myocardium remodeling. However, it doesn't always lead to necessary result. Therefore, during the last years a great attention is given to the development of new ways of treatment, including cell technologies.

Study objective: estimation of long-term clinical results of CHD treatment using cell therapy with autologous mononuclear bone marrow cells (AMBMC) and fetal cells (FC); clinical and experimental estimation of the homing effect (stem cells sticking in the heart) of AMBMC and human embryo stem cell (HESC).

Methods: the study comprised 70 patients (52 ± 6.4 years) with ischemic cardiomyopathy who underwent myocardial revascularization and cell therapy from 2003 to 2006. All patients with CHD had old myocardial infarction. In 40 (57%) patients AMBMC was used, in 30 (42%) – FC. Cells were transplanted into the heart during CABG surgery and/or heart aneurysm resection, or in the angiological department setting. Instrument inspection of efficiency of procedure was performed by stress-echocardiography with Doppler analyses and radionuclide myocardium imaging with Tl199 in comparison with the control group ($n=15$). Homing effect of AMBMC and FC by labeling with isotope "Ceretek", ^{99m}Tc -HMPAO and coronary introductions was estimated in clinical settings ($n=18$) and in rabbit experiments ($n=5$).

Results: Clinical improvement of heart failure (reduction of NYHA class) was seen in all patients during the early postoperative period. Nevertheless, after 12 months in 4 patients with cell therapy with AMBMC we repeated procedures of cell administration because of heart failure progressing. Ultrasonic parameters

of intracardiac haemodynamics improved significantly only in patients with FC transplantation after 6 and 12 months of observation. Thus, end-diastolic volume did not exceed 200 ml. However temporary defects of myocardial perfusion in patients with CHD were significantly improved in both groups of patients with cell therapy after 3, 6 and 12 months vs. control group. Homing effect of labeling with isotope AMBMC after 24 hours of heart implantation was 2.5%, and in experiment with FC – 15%.

Conclusion: Clinical results of cell therapy with autologous mononuclear bone marrow cells and fetal cells in patients with CHD demonstrated safety of the method. However, intracardiac haemodynamics parameters improved only in patients after treatment by fetal cells vs. control group and group with AMBMC. Index of myocardial perfusion improved significantly both in group with AMBMC and FC. Homing effect is most expressed for embryo stem cells.

ANGIOGRAPHIC RESULTS IN THE LONG-TERM FOLLOW-UP AFTER CORONARY STENTING DEPENDING OF THE DURATION OF CLOPIDOGREL USE

Z.A. Akhmedova (Aligushieva), A.S. Shanoyan, N.V. Kuchkina, D.G. Iosseliani (Moscow)

Purpose of study: comparison of long-term clinical and angiographic results of stenting with different types of coronary stents depending on the duration of a disaggregant (Clopidogrel) intake.

Material and methods: the study comprised 546 patients aged 38 – 70 years (on the average 56.7 ± 9.4) with CHD, who received different types of stents. The first group included patients ($n=180$), who received Plavix (75 mg) for 1 month; the patients of the second group ($n=182$) received Plavix (75 mg) for 3 months; the patients of the third group ($n=184$) received Plavix (75 mg) for 6 months. One hundred patients in the first group (55.5%) received bare stents (Bx Sonic), 50 (27.4%) – Sirolimus-eluting stents (Cypher), 30 (16.6%) – Paclitaxel-eluting stents (Taxus). In the second group they were – 102 (56.6%), 50 (27.1%), and 30 (16.4%), respectively. In the third group – 104 (56.5%), 50 (27.1%) и 30 (16.3%), respectively. Main clinical and angiographic characteristics were not significantly different between the groups.

Results: 83.3% patients in the first group, 97.3% in the second group and 91.8% patients in the third group were angina-free in the long-term follow-up, $P>0.05$. No deaths were noted in any of the studied groups. MACE (angina recurrence, repeated MI), caused by in-stent stenoses were seen in 10.3% vs. 8.3% and 4.7%, respectively, $P>0.05$. The incidence of in-stent stenosis in the studied groups was 27 (12.1%), 20 (8.7%) and (5.6%) cases, respectively, $P>0.05$. The analysis

of Plavix (75 mg) intake duration revealed that the incidence of in-stent stenosis after bare stents implantation was 18 cases (14.2%) in the first group (1 month), 15 cases (11.3%) in the second group (3 months) and 12 cases (8.8%) in the third group (6 months), $P>0.05$; after Sirolimus-eluting stents – 5 (8.3%), 2 (3.2%) and 0%, respectively, $P<0.05$. With Paclitaxel-eluting stents these values were 4 (11.4%), 3 (8.8%) и 1 (2.7%), respectively, $P<0.05$;

The analysis of complications (minor bleedings), developing after prolonged Plavix intake did not reveal significant differences in the studied groups; their incidence was 1.6%; 2.7% and 7.6%, respectively, $P>0.05$.

Conclusions: prescription of Plavix (75 mg daily) for a long period of time (6 months) is safe.

Prolonged intake of disaggregants is indicated in patients receiving drug-eluting coronary stents.

ENDOVASCULAR HEMOSTASIS IN ACUTE GASTROINTESTINAL HEMORRHAGE

C.A. Atamanov, A.I. Kvashin, A.V. Melnik, F.N. Pachtersky, A.F. Portnjagin, E.G. Grigoriev (Irkutsk)

Study objective. To demonstrate the possibilities of endovascular hemostasis in acute gastrointestinal hemorrhage in patients at high surgical risk.

Material and methods. The first intervention for gastrointestinal hemorrhage in our clinic has been performed in 1974. Over thirty years of work endovascular hemostasis has been carried out in 360 patients.

Angiographic diagnosis was based on the detection of direct and indirect signs of hemorrhage. The direct signs included: extravasation of contrast agent was found in a quarter of patients; thrombotic amputation of bleeding artery – in 9% of patients. Regional arterial spasm was found in 40% of patients. Aneurysm of celiac trunk branches is a rare angiographic finding, which can be interpreted as direct sign of proceeding bleeding if revealed in acute period of hemorrhage (in 2 cases). As for indirect signs, the local hypervascularity and periarterial diffusion were observed.

We have performed endovascular interventions of three kinds: temporary blood flow reduction or arrest in the gastro-duodenal arterial branches by the way of vasopressor infusion; combined angioreduction by temporary peripheral microaggregant embolization with human serum albumin on the background of vasopressor infusion and material superselective embolization of celiac trunk branches. Occlusive and pressure-occlusive methods of gastroenteric hemostasis were used in clinical settings in 320 patients. Immediate hemostasis was achieved in 75%. Hemorrhage recurred in a quarter of them. Endovascular occlusion was realized using small-porous polyurethane, surgical felt, various coils, haemostatic sponge and stent-graft.

Angioreduction by nonabsorbable emboli was performed in 230 patients, immediate hemostasis was observed in 90% of them. Hemorrhage recurred in 10%.

Conclusions. Endovascular occlusion of celiac trunk branches and superior mesenteric artery in acute gastrointestinal hemorrhage allows to achieve immediate hemostasis and to gain time for stabilization of patient's condition for eventual elective surgery, and in some cases, conservative therapy without surgical intervention is possible.

ANALYSIS OF UNFAVORABLE EVENTS PREDICTORS IN PATIENTS WITH ACUTE CORONARY SYNDROME IN LONG-TERM FOLLOW-UP AFTER PERCUTANEOUS CORONARY INTERVENTION

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Study objectives. Analysis of the influence of risk factors of cardiovascular events on the long-term follow-up after percutaneous coronary intervention (PTCA) in patients with acute coronary syndrome (ACS).

Materials and methods: the study comprised 104 patients without ST-elevation, 26 (25%) with type 2 diabetes mellitus (DM) and 78 (75%) without DM. Mean age of patients with DM was 57.8 ± 3.34 , without DM – 55.8 ± 1.51 years ($p < 0.05$). There were 29 (28%) women and 75 (72%) men. Arterial hypertension (AH) was present in 18 (75%) and 58 (73%). 86% of patients were admitted with primary acute myocardial infarction (AMI). PTCA with bare stent implantation was performed within 10 ± 2.4 hours after the onset of ACS. Control study was conducted after 12 ± 1.2 months.

Results. Immediate angiographic effect of the procedure (regression of the symptoms and restoration of blood flow up to TIMI III) was observed in 100%. In postoperative period all patients took Clopidogrel 75 mg per day, 67% and 60% of them took Clopidogrel for more than 6 months. 58% and 60% of patients were on statins for one year after PTCA. All patients were on beta-blockers and aspirin. The impossibility of Clopidogrel and statins intake was not related to the social rank of the patients. Coronary artery bypass grafting due to multiple lesions of coronary arteries was performed in 8% и 17% ($p < 0.05$). One patient (1%) with DM died from repeated myocardial infarction complicated by cardiogenic shock 11 months after PTCA. Repeated emergency PTCA with satisfactory results was performed in 1 (1%) patient with myocardial infarction and in-stent restenosis in the group without DM. In one year after PTCA 40 (38%) patients without DM and 6 (6%) with DM were free of angina.

Conclusions. The “aggressive” treatment of myocardial infarction is an effective method in the long-term follow-up. Angina in the long-term follow-up was revealed more frequently in patients with DM than in patients without DM. In the presence of acute coronary syndrome DM is an independent predictor of unfavorable outcome.

EVALUATION OF MYOCARDIAL KINETICS CHANGES AFTER CORONARY STENTING

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After coronary stenting ejection fraction (EF) is preserved and not exceeding normal limits in most patients with CHD. Besides, EF does not correlate with the severity of symptoms and physical tolerance. For this reason it is necessary to use additional methods for the evaluation of myocardial contractility in normal systolic LV function.

Purpose of study: to investigate the dynamics of general and regional (segmental) myocardial contractility after coronary stenting with bare stents.

Material and methods: we studied 26 patients, 24 of them were males. Mean age of patients was 49 years. Twenty subjects (76%) had a history of myocardial infarction. The control group comprised 25 patients. These were normal subjects without CHD, in whom CAG with ventriculography was performed with differential diagnostic purpose and a frame-by-frame analysis of ventriculogram and EchoCG was carried out. The indices of LV contractility in these patients were taken for normal. Before and after stenting EF in the group of study were normal, as assessed by Simpson EchoCG and left ventriculography. We have additionally used the method of sector EF evaluation. When performing frame-by-frame kinetics analysis the cardiac cycle between two subsequent systoles was divided into 25 frames. The LV contour was divided into 20 segments. The mean normal EF value was determined in the control group using standard deviations method. Hyper- and hypokinesis of the myocardial segments was characterized by EF value deviation beyond the limits of two sigma CI (or over two SD). In-stent restenosis was determined as vessel diameter narrowing by over 50% at repeated coronary angiography.

Results: restenosis was revealed in 11 out of 26 patients (42%). EchoCG revealed significant decrease of LV end-systolic volume (ESV) after stenting in patients without restenosis ($p < 0.005$). No reliable differences in end-diastolic volume (EDV) and EF before and after stenting in patients without restenosis was revealed. The evaluation of segmental LV contractility using standard deviations method revealed hyperkinesis of the healthy myocardial areas and an improvement of segmental contractility in the territory supplied by the stented artery, in the absence, as well as in the presence of restenosis, which is suggestive of myocardial viability. In the presence of multi-vessel

disease and progressive LV dilatation these signs were absent, in spite of the ischemic factor elimination. EchoCG data correlate with ventriculography data.

Conclusions:

1. In the absence of restenosis after coronary stenting the ESV decreases reliably, which is an indirect sign of the improvement of LV systolic function.
2. EDV is not influenced by stenting.
3. Segmental contractility in the territory supplied by the stented artery improves regardless of the presence or absence of late restenosis. This phenomenon is seen only in single-vessel disease.
4. In the presence of multi-vessel disease we noted a deterioration of local myocardial contractility and a progressive LV dilatation in the territory supplied by the stented artery, in spite of the absence of restenosis and blood flow restoration, that is, of the ischemic factor elimination.

ANALYSIS OF MID-TERM RESULTS (≥ 4 YEARS) IN PATIENTS WITH CHRONIC HEART DISEASE AFTER STENTING WITH DRUG-ELUTING AND UNCOATED STENTS

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Background: In spite of wide spread of drug-eluting stents there is a paucity of available information concerning mid-term results (3 years and more) of their use. Besides these data have to be analyzed and compared with those after bare metal stents use.

Study objectives: to analyze the 4-year follow-up of treatment of CHD in two groups of patients treated (1) with bare metal stents (BMS) and (2) drug-eluting stents (DES).

Study design: comparative retrospective analysis of patients' groups with comparable clinical and angiographical criteria.

Material and methods: comparative analysis was conducted in 210 patients divided into 2 groups: BMS – 96 patients and DES – 114 patients. The study comprised only the patients who underwent control angiography 48-60 months after the procedure. The patients of BMS group received 204 stents in 134 arteries; the patients of DES group received 237 Sirolimus-Eluting Cypher Stents in 148 arteries. The main clinical and angiographical criteria were comparable in both groups. Angina of III-IV functional class was present in 52 patients (54.2%) in Group 1 and in 78 patients (68.4%) in Group 2, diabetes mellitus in 11 (15.9%) and 29 (25.4%), respectively. Multivessel coronary lesions were observed in 82 (85.4%) and 98 (85.9%), lesions of the left main coronary artery – in 11 (15.9%) and in 20 (17.5%), occlusions – in 22 (22.9%) and in 28 (24.6%), small coronary arteries (2.75 mm and less) – in 28 (29.2%) and in 44 (38.6%), respectively, in the BMS and DES groups. Mean length of stenosis in BMS group was 18.3 ± 3.3 mm and 26.7 ± 4.7 mm in DES group. Mean

duration of the follow-up was 48.5 ± 4.8 months and 39.6 ± 5.3 months, respectively.

Results: Angiographic restenosis in BMS group was found in 9.4%, in DES group – in 7%. The vast majority of restenosis in BMS group were of diffuse character (83.5%), while in DES group all stenoses were local and segmental (predominantly at the proximal end of stent). Cardiac mortality was 1.1% in Group 1 and 2.6% in Group 2 ($p < 0.024$). the rate of MACE (myocardial infarction, mortality) in BMS group was 7.3%, while in DES group – 8.8% ($p = ns$). In-stent thrombosis was found in 2.1%, and in 2.6% respectively ($p = ns$). Repeated myocardial revascularization was performed mainly for atherosclerosis progression and new stenoses development; its rate was 45.8% in BMS group and 14.4% in DES group ($p < 0.001$). 4-year survival rate in Group 1 was 98.9% and in Group 2 – 97.3% ($p < 0.01$); angina-free survival in BMS group was 54.7%, and in DES group – 87.4% ($p < 0.002$).

Conclusions: Mid-term results of DES use confirm tendency for these stents advantage vs. with bare metal stents, and this advantage becomes more expressed when compared with the early results (6-9 months). While cardiac mortality was significantly lower in BMS group, the frequency of in-stent thrombosis between groups was not significantly different. In 2 cases in-stent thrombosis developed very late after Cypher stent implantation, while in the early follow-up (8 and 11 months) the stents in these patients were permeable without restenosis.

RECANALIZATION OF LATE RADIAL OCCLUSION AFTER TRANSRADIAL INTERVENTION PROCEDURES: A NEW METHOD FOR THE INTERVENTIONAL CARDIOLOGISTS USING RADIAL APPROACH IN THEIR PRACTICE

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Background: In spite of the advantages of radial access (reduction of hospital stay, significant decrease of complications related to arterial access, comfort for the patient) late occlusion of radial artery is found in 9-20% of cases, thus making problematic repeated usage of this artery.

Study objectives: to use in clinical practice all known surgical armaments for recanalization (both for coronary and peripheral arteries), in order to restore the permeability of the occluded artery and make it re-usable for intravascular procedures.

Materials: recanalization technique was applied in 37 patients with late occlusion of radial artery in various time period after primary procedures (2 days – 32 months). There were 34 were men and 3 women aged 42-67 years. Full-length arterial occlusion was present in 28 patients, segmental occlusion of different length – in 9. Recanalization of subacute thrombosis of radial artery 2-8 days after primary procedure was performed in 3 cases.

Methods and surgical armaments: the presence of distal collateral pulse (through ulnar artery and the palmar arch) is the compulsory condition for the procedure. After puncture made with a thin needle 21G the artery stump was catheterized by 0.021 inch guide and then recanalization by Dotter method using 4-6F dilators 11 cm and 23 cm long was performed.. Dilatation by long balloons (30 cm) with the diameter of 3-4.5 cm for the adequate opening of the artery lumen was performed in 7 cases. Both hydrophilic guides Shinobi, Pilot (150-200) and non-hydrophilic guides of various rigidity with 0.018-0.021 inch diameter were used for recanalization. After recanalization a long (23 cm) introducer was inserted in the radial artery, with its tip coming out to the brachial artery. Control angiography and Doppler study were performed 2-7 days after the interventional procedure. Control angiography of the recanalized radial artery during repeated interventions was performed in 18 patients (48.6%).

Results: the procedure proved effective in 31 out of 37 cases (83.8%). Radial artery perforation without clinical consequences was observed in 3 patients. In 1 case dislocation of thrombotic masses into the ulnar artery occurred during recanalization of subacute occlusion; thrombolysis with Actilyse (100 mg) gave good result (control Doppler analysis in 4 days). Successful recanalization of a radial artery with atypically high origin from brachial artery was performed in 3 cases.

In the long-term follow-up (6-30 months) the permeability of successfully recanalized arteries was preserved in 18 out of 31 patients (58.1%) and was confirmed by angiography (10 patients) or US-study (8 patients). One patient underwent repeated recanalization of occluded radial artery 6.5 months after a successful primary recanalization. Residual stenosis of various degree (30-60%) or diffuse thinning of the permeable radial artery was present in the long-term follow-up in 11 out of 18 patients with permeable arteries (61.1%).

EARLY AND LONG-TERM OUTCOMES OF THE TREATMENT OF BIFURCATIONAL STENOSES

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Study purposes: to estimate the effectiveness of coronary stenting (CS) with drug-eluting stents for the treatment of various types of bifurcational coronary lesions.

Material and methods: we analyzed the results of CS of various types of bifurcational stenoses in 204 patients aged 35-76 years (mean age 54.3±3.4 years). Stenoses types were distributed as follows: type I – 45 (22.1%), type II – 60 (29.4%), type III – 67 (32.8%) and type IV – 22 (10.7%). Y-bifurcation was found in 177 (86.7%) cases, T-bifurcation – 27 (13.3%). The distribution of stented bifurcations was

as follows: LAD+DB – 118 patients (57.8%), CxB+OMB – 47 (23.1%) and RCA – 18 patients (19.9%). The “culotte” technique was applied in 67 cases (32.8%), the “crush” technique – in 21 (10.3%), T-stenting – in 22 cases (10.8%), lateral branch was not stented in 94 cases (46.1%). Final “kissing balloon” angioplasty was performed in 174 cases (85.3%).

Results: in-hospital complications developed in 11 patients (5.4%): one death (0.5%), 10 myocardial infarctions (4.9%). Long-term results were evaluated at 6 – 44 months. 1-year and 3-year survival rates were 98.8% and 91.4%, respectively. Twelve patients had myocardial infarction (6.2%). Control angiography was performed in 128 patients (66.3%). Angiographical restenosis was found in 14.7%, with restenosis in the ostium of lateral branch accounting for 90.5% of them. The rate of repeated revascularization was 11.3%. Among 94 patients with unstented lateral branches only 5.7% developed recurrent angina angiographical restenosis. Comparative evaluation of the long-term results after the application of different stenting techniques (“culotte”, “crush” in various modifications and T-stenting) did not reveal significant differences in frequency of restenosis and MACE.

Conclusion: considering immediate and long-term results, CS of bifurcational lesions is an effective method. The rate of restenosis after lateral branch stenting is technique-independent. The stenting of only one (main) artery is accompanied by low frequency of repeated restenosis and MACE.

EFFECTIVENESS OF DRUG-ELUTING STENTS IN THE TREATMENT OF THE LEFT MAIN CORONARY ARTERY LESIONS

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Study objectives: evaluation of short- and long-term results of treatment of the lesions of the left main coronary artery (LCA) using drug-eluting stents (DES).

Material and methods: Since November 2003 till November 2006 LCA stenting with DES was performed in 158 patients aged 47-72 years (mean, 55±2.4 years). The lesions were located: in the LCA ostium – 15 patients (9.5%), in the middle third – 21 (13.3%), in the bifurcation – 91 (57.6%), in the ostium of the LAD or the CxB – 31 patients (19.6%). Stable angina of III-IV functional class (CCS) was present in 143 patients, instable angina – in 15. Concomitant diabetes was present in 32 patients (20.2%). Left ventricular function impairment was observed in 23 cases (14.5%). One stent was implanted in 68 patients (43.1%); 2 and more stents – in 90 (57.0%). The “culotte” method was used for bifurcation stenting in 80 patients (50.6%), the “crush” technique – in 78 (49.4%). The procedure was completed by “kissing” balloon technique

in all cases of bifurcational and ostial lesions of the LAD and CxB. Inhibitors of IIb/IIIa receptors were used in 25 patients (15.8%).

Results: Immediate clinical and angiographical effect was achieved in all patients. Restenosis (angina recurrence) developed in the long-term follow-up (at 6-34 months) in 19 patients (12.1%). All these patients underwent repeated myocardial revascularization (RMR) by balloon dilatation (10 patients) or additional DES implantation (4 patients). Another 5 patients were referred to coronary artery bypass graft surgery. 3-year survival rate in patients free of angina and cardiovascular events was 94.9%. We did not find any significant differences in the long-term results between groups of "cullotte" and "crush" technique.

Conclusion: Stenting of LCA with DES is an effective procedure from the viewpoint of long-term results, with low frequency of recurrent angina and RMR. Our results show that the use of DES can be an alternative to surgical myocardial revascularization in patients with LCA involvement. However, more reliable estimation is impossible without randomized studies and the increase of the number of patients.

GLUCOSE-LEUCOCYTIC INDEX IN THE PROGNOSIS OF THE COURSE OF ACUTE MYOCARDIAL INFARCTION

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Glucose-leucocytic index (GLI) – calculated index represented as glucose and blood product, in absolute values, divided by 100 ($GLI = (\text{leucocytes} \times \text{glucose}) / 100$), and expressed in conventional units (cu.).

Purpose and objectives: to study the course of acute myocardial infarction (AMI), the development of complications and mortality depending on GLI value at admission.

Material and methods. We have studied 164 patients with AMI within the first 24 hours of the disease. Mean age of patients was 55.7 ± 0.95 years, there were 130 men and 34 women. Total mortality in this sample was 17%. The diagnosis was verified clinically and on the base of ECG data, early and late markers for myocardial necrosis were determined (Troponin T, CPhK, MB-CPhK, LDG). Primary percutaneous coronary interventions (coronary angiography, PTCA, stenting) were performed in 51 patients (30%), fibrinolytic therapy – in 41 patients (25%). Blood sampling for serum glucose and clinical analysis was taken immediately at admission.

Results and discussion. The analysis of mean GLI values dispersion seen in AMI complications showed that it was higher in those who died (1.3 ± 0.18 cu. Vs. 0.85 ± 0.04 cu. in surviving patients, $p < 0.001$). In cardiogenic shock, ventricular fibrillation, ventricular tachycardia, pulmonary edema GLI dispersion was significantly higher ($p < 0.0001$). In the presence of no-reflow phenomenon during PTCA GLI dispersion

was statistically significant (1.3 ± 0.31 cu. with no-reflow, vs. 0.97 ± 0.06 cu. in patients with restored distal blood flow, $p < 0.05$). We have also noted a correlation between mean GLI values dispersion in patients with initial high degree of coronary stenosis ($p < 0.05$) and with greater degree of residual stenosis after coronary intervention ($p < 0.05$).

On the base of clinical and laboratory data the dispersion of mean GLI values was determined in relation with ST segment elevation on ECG ($p < 0.05$), the indices of coagulation hemostasis ($p < 0.05$), CPhK ($p < 0.05$), systolic and diastolic AP ($p < 0.05$).

The analysis of GLI correlation with AMI complications revealed its moderate interdependence with mortality ($r = -0.29$, $p < 0.001$), cardiogenic shock ($r = -0.42$, $p < 0.0001$), pulmonary edema ($r = -0.33$, $p < 0.001$), ventricular tachycardia ($r = -0.42$, $p < 0.0001$), ventricular fibrillation ($r = -0.41$, $p < 0.0001$). The no-reflow phenomenon after revascularization had moderate correlation with GLI ($r = 0.29$, $p < 0.05$), with predominant lesion of the LCA ($r = 0.34$, $p < 0.05$).

Conclusions: thus, GLI, blood glucose and leucocytes can be included into the scale of risk stratification in patients with AMI with a higher degree of predictability of unfavorable course of the disease, than hemoglobin and blood creatinine used in some scales.

GLI index, calculated within 20 minutes after the admission can become, along with the history, the data of physical examination and ECG data, the earliest criterion of risk-stratification of patients with acute coronary syndrome. Its value over 0.9 cu. can predict the risk of such AMI complications, as cardiogenic shock, pulmonary edema, fatal rhythm disturbances mortality, with a high probability, thus motivating the physician to adopt a more active and aggressive tactics of treatment and follow-up. High GLI values at admission are associated with greater volume and severity of the lesion of a symptom-related artery in patients with AMI and are characterized by worse results of thrombolytic therapy and interventional myocardial revascularization.

STRESS HYPERGLYCEMIA AND THE COURSE OF ACUTE MYOCARDIAL INFARCTION

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The increase of the prevalence of the disturbances of carbohydrate metabolism in the population stimulated intensive investigation of this phenomenon in patients with acute coronary pathology.

Purpose and objectives of the study. To investigate the parameters of hyperglycemia as a factor of risk and prognosis of the course of acute myocardial infarction (AMI).

Material and methods. We have studied 164 patients with AMI within the first 24 hours after the onset of the disease, without history of diabetes

mellitus. The [patients were aged from 22 to 84 years, on the average – 55.7 ± 0.95 years. The share of males was 79% (n=130), females – 21% (n=34). 70% of patients had Q-wave MI, in 29% of cases it was recurrent. In 60% (99 patients) the infarction was localized in the anterior wall. Primary percutaneous coronary interventions (coronary angiography, PTCA, stenting) were performed in 51 patients (30%), fibrinolytic therapy – in 41 patients (25%). Total mortality in the sample was 17%.

The diagnosis was verified on clinical and ECG-basis, early and late makers of myocardial necrosis were determined (Troponine T, CPhK, MB- CPhK, LDH). Serum glucose was determined at admission, at days 2 and 3.

Results and discussion. The concentration of glucose in blood of patients with AMI has a time-related phasic character, reaching maximal values in the period of peak stress factors activity, decreasing towards the normal values with their modification or the changes in the amplitude of the influencing factors (treatment, course of the disease).

Highly significant dispersion analysis revealed high values of blood glucose within the first 24 hours after the onset of AMI in dead patients (9.03 ± 0.54 mmol/l in dead vs. 7.3 ± 0.22 mmol/l in surviving, $p=0.0032$), with cardiogenic shock (9.05 ± 0.5 mmol/l with shock vs. 7.0 ± 0.22 mmol/l without shock, $p=0.00003$), pulmonary edema (8.9 ± 0.52 mmol/l, vs. 7.2 ± 0.22 mmol/l without edema, $p=0.0011$) and in patients with acute heart failure of Killpi class 3 and 4 ($p=0.00015$ $p=0.00012$, respectively). Higher level of glycemia was registered also in patients with ventricular tachycardia (VT) (9.6 ± 0.64 mmol/l with VT vs. 7.2 ± 0.21 mmol/l without VT, $p=0.00002$), ventricular fibrillation (VF) (9.64 ± 0.70 mmol/l c with VF, vs. 7.24 ± 0.22 mmol/l without VF, $p=0.00003$). The analysis of angiographic data revealed high values of blood glucose in patients with no-reflow phenomenon (9.7 ± 0.40 mmol/l in no-reflow, vs. 8.4 ± 0.41 mmol/l without no-reflow, $p<0.05$). For the first time it was detected that glucose concentration increases parallel to the number of the injured vessels. Thus, in single-vessel disease average blood glucose level is 7.7 ± 0.40 mmol/l, in two-vessel-disease – 8.3 ± 0.60 mmol/l, in three-vessel disease – 9.3 ± 0.60 mmol/l ($p_{1-3}<0.05$). Higher degree of baseline coronary stenosis was associated with higher values of blood glucose ($p<0.05$). Significantly high glycemia values were registered in patients who underwent urgent myocardial revascularization using interventional methods ($p=0.005$).

Correlation analysis revealed moderate and middle levels of blood glucose interaction with ventricular fibrillation ($r=-0.53$, $p<0.0001$), cardiogenic shock ($r=-0.4$, $p<0.0001$), pulmonary edema ($r=-0.4$, $p<0.0001$), with acute heart failure of 3rd and 4th degree ($r=0.45$ and $r=0.46$, $p<0.0001$ and $p<0.001$, respectively), ventricular tachycardia and forming LV aneurysm ЛЖ ($r=-0.41$, $r=0.30$ with $p<0.0001$ and $p<0.01$, respectively), mortality ($r=0.31$, $p<0.01$).

Conclusions:

1. The severity of myocardial infarction course, the incidence of certain complications are reliably related to the concentration of blood glucose at admission.
2. In blood glucose values over 8.0 mmol/l at day 1 there is a statistically significant increase of the rate of cardiogenic shock, pulmonary edema, ventricular tachycardia, ventricular fibrillation and mortality.
3. Blood glucose concentration at admission correlates with higher baseline degree of the stenosis of the symptom-related and lower rate of angiographic success with interventional myocardial revascularization.

PREDICTORS OF UNFAVORABLE CARDIOVASCULAR OUTCOMES IN PATIENTS WITH ACUTE CORONARY SYNDROME

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Study objective: evaluation of the prognosis of in-hospital treatment using clinical, angiographic and laboratory predictors of cardiovascular outcomes in patients with acute coronary syndrome (ACS).

Material and methods: 92 patients with ACS admitted to Kemerovo Cardiological Centre from February till August 2007 were examined. Patients were divided in 2 groups: I (n=58 patients) – with ST-elevation (ECG), II (n=34 patients) – with segment ST-depression.

Coronary angiography during the first day of hospitalization was performed in all patients, 69 (75.0%) underwent percutaneous coronary intervention (PCI). Besides, in the first days platelet account, maximal velocity of thrombocyte aggregation, the levels of acute phase proteins, interleukin-6 (IL-6), soluble fibrin-monomeric complexes, sP-selektine were evaluated.

Results: mean time from the moment of the onset of ACS to PCI was 4.5 hours in group I and 6.7 hours in group II. Average percentage of coronary lesions did not differ significantly between the groups: group I – 29%, group II – 23%. Occlusion of infarct-related artery (IRA) was revealed in 42 (72.4%) patients from group I. All of them underwent PTCA, including 30 (71.4%) – with stenting of IRA. In group II IRA occlusion necessitating PTCA was revealed in 16 (47.1%), in 3 of them (18.8%) – with stenting. By the end of hospital stay (17 days) complications in group I of patients were significantly more common ($p<0.01$) in comparison with patients of group II. Postinfarction angina developed in 15 (20.7%) patients of group I, in-stent thrombosis – in 6 (10.3%), with one lethal outcome (1.7%). Postinfarction angina in group II was present in 1 patient (2.9%); other complications weren't found.

The analysis of laboratory data has shown, that the indices of platelet homeostasis in group I were

initially less favorable than in group II. The level of acute phase protein also was significantly ($p < 0.05$) higher in group I (8.4 mg/l) in comparison with group II (4.9 mg/l). The level of cytokins (IL-6) was higher in group I than in group II (11.7 ng/ml against 4.9 ng/ml, respectively; $p < 0.01$). The level of soluble fibrin-monomeric complexes was higher in group I than in group II (10.3 and 6.9 mg/100 of ml, respectively; $p < 0.05$). The maximum distinctions were revealed in the levels of sP-selektine. In group I the level of sP-selektine was significantly ($p < 0.001$) higher (119 ng/ml) than in group II (63.2 ng/ml).

Conclusion: unfavorable in-patient prognosis was caused mainly by abnormalities in blood coagulation potential and proinflammatory activity, in less amount – by clinical and angiography characteristics.

EFFECT OF PERCUTANEOUS TRANSLUMINAL CORONARY INTERVENTION IN PATIENTS WITH CORONARY HEART DISEASE AFTER CORONARY ARTERY BYPASS GRAFTING

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Background: according to the Guidelines for Percutaneous Coronary Intervention (PCI) (ACC/AHA/SCAI 2005) risk of PCI in native vessels after coronary artery bypass grafting (CABG) is high; at the same time current frequency of failures with these interventions is quite comparable with frequency of complications after PCI in patients without previous CABG. The frequency of successful PCI in venous grafts exceeds 90%, with death rate $< 1.2\%$ and the rate of Q-wave myocardial infarction $< 2.5\%$. At the same time the non-Q-wave MI in this group is more common than after PCI in native vessels in non-operated patients. According to ACC/AHA/SCAI 2005, it is reasonable to use triple antiplatelet therapy (ATT) (aspirin + klopido-grel + IIb/IIIa receptors inhibitor) after PCI in patients with instable angina (IA).

Study objectives: to study the effect of PCI in patients with CHD after CABG and the possibility of the use of double ATT (aspirin+klopido-grel) in IA.

Material and methods: 126 patients after CABG, mean age 59.2 ± 1.1 years. Average interval between CABG and subsequent PCI was 6.3 ± 0.9 years. CHD in the form of stable angina (SA) was revealed in 84 (667%) patients, 42 (33.3%) were in IA. Essential hypertension was revealed in 96 patients (76.2%), diabetes mellitus in 27 (21.4%), obesity – in 19 (15.1%); 82 (65.1%) had a history of MI, 47 (37.3%) were after prior PCI. 94 patients (74.6%) underwent 101 endovascular procedures in native coronary arteries (CA): 12 PTCA and 89 PTCA with stenting (a total of 106 stents was implanted, including 29 stents with antiproliferative coating). 32 patients (25.4%) underwent 44 endovascular procedures in their venous grafts: 10 PCA and 34 PCA with stenting (34 stents, including 5 with antiproliferative coating); protection from

distal embolism was used in 4 patients. In order to prevent thrombotic complications after PCI all patients underwent antiplatelet therapy according to the following scheme: in cases with IA – loading dose of klopido-grel (300 or 600 mg) and aspirin (250 mg) at least 2-6 hours before the procedure, parenteral administration of non-fractionated heparin during coronary intervention under clotting time control (not less than 250 sec), with subsequent continuation of aspirin (100 mg daily) and klopido-grel (75 mg daily) intake for 6 months; in cases of elective intervention in SA group – klopido-grel (75 mg per day) and aspirin (100 mg per day) were administered for 5-7 days before the procedure, during and after the intervention the volume of pharmacological support wasn't changed vs. IA group.

Results: clinical and angiographic effect with endovascular treatment of native CA was achieved in 98.9% of patients, 1 patient (1.1%) died from target vessel thrombosis; in the group undergoing endovascular treatment of venous grafts the treatment was effective in 96.9% of patients, a non-Q-wave MI developed 1 patient (3.1%).

Conclusion:

1. PCI in native vessels and venous grafts in patients after CB shows good clinical effect.
2. It is possible to perform PCI in patients with IA under double ATT (aspirin+klopido-grel)

EMBOLIZATION OF OVARIAN ARTERIES IN THE PRESENCE OF SPECIFIC FEATURES OF UTERINE MYOMA BLOOD SUPPLY

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Background: uterine arteries embolization (UAE) is an effective method for the treatment of uterine myoma. However, in some cases the presence of specific features of blood supply of uterus and ovary, total devascularization of myoma necessitates additional embolization of ovarian arteries.

Materials and methods: from 2002 till 2007 UAE was performed in 1420 patients with uterine myoma. In 53% of patients had utero-ovarian anastomosis of different types: type I (A or B) was present in 86% of these patients, type II – in 11% and type III – in 3% (22 cases).

Results: after UAE blood supply of parts of myomatous nodes persisted in 40 patients with 1-B and 3 types of anastomosis. In 26 of them embolization of ovarian arteries (unilateral in 21 and bilateral in 5 cases) with microcatheter was performed. If microcatheter passage below the level of ovarian branches origin was infeasible, the embolization was performed with large spherical particles from the ostium of ovarian artery. Embolization of ovarian arteries was effective from anatomical (devascularization of mioma), as well as from clinical viewpoint. The signs of ovarian amenorrhea were not found in any case.

Conclusions: in the presence of specific features of uterus and ovaries blood supply UAE may require additional embolization of utero-ovarian anastomoses. Embolization of these anastomoses through the ovarian artery is an effective and safe method.

UTERINE ARTERIES EMBOLIZATION IN OBSTETRICAL PATHOLOGY

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Backgrounds: uterine myoma isn't the unique pathology in which embolization of uterine arteries branches (UAE) is considered reasonable. Besides gynecologic pathology, such as uterine vessels amyloidosis, arteriovenous uterine malformation and bleedings caused by small pelvis tumors, UAE can be used in obstetrics.

Materials and methods: From 2004 till 2007 UAE was performed in 14 patients with obstetrical pathology, that is – in about one percent from more than 1400 cases encountered during 2002-2007.

In 4 cases UAE was performed for postpartum hemorrhage in case of metratonia. In 4 patients UAE was used as a part of multimodality treatment of cervical pregnancy along with curettage, local and intra-arterial injection of metotrexate. In 6 patients UAE was performed simultaneously with Cesarean section against the background of placenta rotation with high risk of intraoperative bleeding. Particles of PVA for embolization were used in all patients; in 1 case introduction of PVA was completed by balloon dilatation of internal iliac arteries.

Results: Immediate hemostasis was achieved in all cases of UAE performed for postpartum hemorrhage, additional surgery wasn't necessary. In 2 patients with cervical pregnancy good results were observed; in 1 case we had to repeat the procedure twice due to the restoration of trophoblast blood supply. However it was possible to preserve the uterus in all patients.

Excellent results after UAE with Cesarean section were obtained in 4 cases (minimal perioperative hemorrhage). In 1 case the effect of UAE was moderate and in 1 case failed for technical reasons. Though, all patients had successful Cesarean section with organ preservation.

Conclusions: UAE can be successfully used in obstetrical pathology for postnatal hemostasis, hemostasis during Cesarean section, as well as in complex treatment of cervical pregnancy.

LONG-TERM CLINICAL OUTCOME OF STENTING: COMPARISON OF BARE METALLIC STENTS AND CYPHER STENT

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The stenting of the coronary arteries with drug-eluting stents leads to considerable decrease in frequency of restenosis. Recently the influence of coated stents on solid end-points in the long-term follow-up is widely discussed. New data about the increase of late thrombosis frequency in the long-term period are suggestive of deterioration of prognosis.

Study objectives: to compare the influence of bare metallic stents and Cypher stent on frequency of unfavorable events in patients with CHD in the long-term follow-up.

Since March 2002 till September 2004 stenting was performed in 674 patients. Cypher stent was used in 363 patients, bare metallic stents – in 311 patients. WE evaluated the general death rate, the frequency of other unfavorable cardiovascular events, restenosis, angina recurrence after the discharge. According to preliminary results of 36 months-long follow-up, no significant difference in death frequency, the rate of myocardial infarction or stroke between the groups was revealed. There was a significant difference in the frequency of in-stent restenosis and angina recurrence: these events were less common in patients after Cypher stent implantation. Currently the statistical data manipulation is processing.

Conclusions: according to preliminary data, during three years of the follow-up the Cypher stent preserves its advantage over bare metallic stents, as for the decrease of in-stent restenosis rate. Also, it does not lead to the increase of the frequency of adverse cardiovascular events.

TRANSCATHETER TREATMENT OF PATIENTS WITH LIVER TRAUMA

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The treatment of the wounds and closed injuries of the liver remains a complex surgical problem, and up to now the methods of hemostasis are the leading ones. The methods of minimally invasive surgical technologies in severe traumas of the liver are being elaborated in the Sklifossovsky Institute.

72 subjects with trauma underwent angiographic examination. It was indicated for: progressive increase of central or subcapsular hematoma; turbulent blood flow development in voluminous hepatic structures revealed by ultrasonic Doppler study; clinical manifestations of hemobilia.

Angiographic study revealed the following types of liver injuries: false aneurysms of the hepatic artery – 24 patients, central hematoma – 7, subcapsular hematoma – 8, arteriovenous fistula – 7, false aneurysm with arteriovenous fistula – 4, portal hematoma – 2, isolated injury of the hepatic artery – 1, traumatic occlusion of the celiac trunk – 1; in 9 cases no changes in liver architectonics were seen. Thus, angiographic study allows to obtain a reliable idea on the character and localization of hepatic injuries.

On the base of angiographic data 32 patients underwent endovascular embolization. The indications for endovascular hemostasis in 21 cases consisted in false arterial aneurysm, in 4 – arteriovenous fistula, in 3 – the combination of arterial aneurysm with arteriovenous shunt, and in 4 – the data of ultrasound Doppelr study. The source of bleeding was most commonly localized in the VI, VII and VIII segments of the liver.

The complications after hepatic artery embolization were noted in 5 patients out of 32. In 2 cases it was bleeding recurrence caused by the development of collateral blood supply of the aneurysmatic cavity. Technical difficulties encountered during catheterization resulted in occlusion of the proximal segment of the right hepatic artery in 2 patients. In 1 patient bleeding recurrence was caused by the choice of an inappropriate occluding agent. This patient underwent successful repeated embolization.

Thus, endovascular embolization is an effective method of hemostasis, allowing to avoid repeated complex surgical interventions, in patients with liver trauma.

IMPLANTATION OF A BIFURCATIONAL STENT-GRAFT AS ONE OF THE METHODS FOR THE TREATMENT OF PATIENTS WITH INFRARENAL ANEURYSMS OF THE ABDOMINAL AORTA

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Aneurysms of the abdominal aorta are life-threatening, as 40% of them get ruptured within one year after being diagnosed. There are no means for conservative treatment of abdominal aortic aneurysms, and for 40 years only surgical methods were used for the treatment of this condition.

Purpose of study: to demonstrate the effectiveness of endografting of the infrarenal segment of the aorta using bifurcational stent-grafts.

Material and methods: from September 2005 till September 2007 we performed 14 endograftings of infrarenal aneurysms of the abdominal aorta using bifurcational stent-grafts. The age of patients varied from 57 to 78 years, on the average, 63 (63 13.2) years. There were 11 men and 3 women.

All aneurysms have been revealed during abdominal US examination and confirmed by angiography and helical CT. Ten patients had aneurysms of the type 2, and 4 – of the type 3 (according to A.V. Pokrovsky).

Associated diseases included: CHD, angina of the 2-3 func.class – 7 patients, arrhythmogenic variant of CHD – 2 patients, 2nd- 3rd degree arterial hypertension – 11 patients, 3rd-4th degree obesity – 1 patient.

Endovascular prostheses were selected on the base of helical CT data. We have inserted 11 stent-grafts EXCLUDER (W.L. Gore), 1 stent-graft TALENT (Medtronic).

Spinal anesthesia was used. In all cases stent-grafts were delivered through the exposed femoral arteries.

In patients with type 2 aneurysm the main (ipsilateral) and the contralateral branches of the stent-grafts were implanted.

A special feature of the procedure in patients with type 3 aneurysms consisted in the unilateral embolization of the internal iliac artery. Two coils were inserted in 1 case, three coils – in 2 cases. These patients underwent implantation of additional iliac stent-grafts (extenders) overlapping the ostium of the same internal iliac artery. In one case catheterization and embolization of the internal iliac artery were not possible.

Periprosthetic blood leakage was revealed during control angiography at the end of the procedure in 4 patients. In cases with proximal leakage two additional aortic grafts were implanted, in cases with distal leakage an additional angioplasty of the distal end of the graft was carried out with good results in both cases. In one case aneurysmal cavity was opacified through the lumbar arteries. CT, performed one week after the procedure, did not reveal blood inflow in the aneurysmal cavity, the aneurysm was thrombosed.

Postoperative period was uncomplicated. The sites of access were healed by primary intention. All patients were discharged in satisfactory condition on the average 6 days after the operation. Long-term results were followed for 1 month to 1.5 years period. Control CT showed that the aneurysms were excluded from the circulation, periprosthetic leakage was not seen.

Conclusions:

1. Endovascular grafting of the aneurysms of infrarenal aortic segment is an effective and safe method of treatment, with specific techniques needed in different types of aneurysms.
2. This method allows to exclude the aneurysms from the blood flow with minimal complications, especially in high-risk patients.

TREATMENT OF SPLENIC ARTERY ANEURYSMS WITH ENDOVASCULAR METHODS

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Over 1800 cases of splenic artery aneurysms are presented in the literature. In most cases this disease is asymptomatic and is revealed only at aneurysm rupture. The ruptures of the splenic artery occur in 9.6% of patients.

Purpose: demonstration of successful endovascular closure of false aneurysms of the splenic artery.

Material and methods: in 2007 we have performed two endovascular procedures for splenic artery aneurysms. In one case proximal embolization of the artery was performed, in another – a balloon-deployable stent-graft was inserted.

A female patient aged 61 years had chronic pancreatitis for several years. Regular ultrasonic examination revealed a false aneurysm of the splenic artery. At admission the diagnosis was confirmed by CT. On 26.04.2007 angiography of the abdominal aorta also confirmed the presence of an aneurysm. The splenic artery is very tortuous, with up to 7 mm diameter. There is a defect in the vascular wall, extending for over 20 mm and serving as a communication with 50×48 mm aneurysm. It was decided to perform proximal embolization with Gianturko coils. The femoral approach was used. The splenic artery was catheterized selectively up to the middle third. Two Gianturko coils (10×8 and 15×8) were inserted, which migrated into the aneurismal cavity with the blood flow. The catheter was re-positioned more proximally, the vessel was embolized with two 10×15 and one 10×8 coils. The blood flow in the artery stopped. The patient had no postoperative complaints. Control CT performed in 24 hours revealed occluded artery and thrombosed aneurysm. There were no signs of ischemic damage in the spleen, supplied by gastropiploic artery. The patient was discharged in satisfactory condition.

Male patient aged 52 years, with a history of pancreonecrosis лет, was admitted with complaints of pains in the left hypochondrium. Ultrasonic examination and CT revealed false aneurysm of the splenic artery and a cyst of the pancreas. In 16.08.2007 it was decided to insert a stent-graft in the splenic artery. The brachial approach was used. Selective catheterization of the celiac trunk was performed. Contrast examination revealed point-like defect of the splenic artery wall, through this defect the blood entered to the aneurysm measuring 40×38 mm. Splenic artery diameter 4 mm. The guide was inserted in the distal segment of the artery. A 19 mm long stent-graft mounted on a 4×30 mm balloon was advanced to the site of the defect and deployed under 14 atm. pressure. Control angiography did not show the opacification of the aneurismal cavity. No subcostal pains were noted postoperatively. Control CT revealed the permeability of the stented segment of the splenic artery, the aneurysm was thrombosed. The patient was discharged in satisfactory condition.

Conclusions: endovascular methods of treatment of splenic artery aneurysms are effective and safe for the treatment of false splenic artery aneurysms.

OUR RESULTS WITH RENAL ARTERIES REVASCLARIZATION FOR ATHEROSCLEROTIC LESION

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Purpose of study: to evaluate early and late results of renal arteries (RA) stenting in patients with VRH in the presence of atherosclerotic lesion.

Material and methods: in 1999-2007 we have performed stenting of the renal arteries in 284 patients. In total 312 stents have been implanted. The patients' age varied from 39 to 82 years, there were 210 men and 74 women. The lesion of one RA was observed in 74%, of two – in 22%, of 3 and more – in 4% of cases.

The diameter of the stented renal artery: 6 mm – 90% of cases, 7 mm – 0.5%, less than 6 mm – 9.5% (as a rule, several additional renal arteries).

In 95% of cases the lesion was located in the ostium and the proximal segment of the artery, in 4% – in the middle segment, in 1% – at the porta.

Systolic arterial pressure varied from 160 to 240 mm Hg. The average degree of artery lesion – up to 76%.

Results: the procedure was successful in 96% of cases. Optimal angiographic results were achieved in 275 patients, suboptimal – in 9 patients (residual stenosis >30%)

Early after stenting arterial pressure decreased from 182±21 mm Hg to 151±12 mm Hg in 88% of patients. The procedure did not influence AP level in 12% of patients. In 54% arterial pressure was stabilized in the presence of supportive pharmacological therapy.

Long-term results of RA stenting (angiography, helical CT) were followed in 62 patients. Over 50% in-stent restenosis was revealed in 15 patients.

Eleven repeated interventions were carried out: stenting in 3 cases, in-stent angioplasty in 8 cases. Four patients refused further treatment.

Complications were seen in 11 patients (3.9%).

1. Pulsatile hematoma at the access site – 4 patients.
2. RA perforation – 4 patients (RA rupture in 2 cases – 1 of the segmental RA, 1 of the segmental branches bifurcation). In 2 cases the damaged RA was stented with the stent-graft, in 2 cases (during the initial years of the experience) a vascular operation was performed, the kidney was preserved.
3. Kidney's capsule perforation with the guide (0.014)! with subsequent development total subcapsular hematoma requiring kidney resection.
4. In 2 cases – stent dislocation from the balloon. In both cases the stent was brought down to the puncture site and removed by surgical means.

Conclusions:

1. The study of early and late results of RA stenting suggest the effectiveness of this method in patients with vasorenal hypertension.
2. Further study of complications seen occurring with this procedure will allow increase its safety.

USE OF SELF-DEPLOYING STENT-GRAFT AS AN ALTERNATIVE TO SURGICAL TREATMENT OF SUBCLAVIAN ARTERY LESIONS

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Erroneous puncture insertion of a large subclavian catheter (diameter 10-12 F) into the subclavian artery is fraught by serious bleeding occurring dur-

ing its removal. Surgical interventions in such case is traumatic and dangerous due to eventual disturbances of the arm functions.

An alternative to surgery is offered by endovascular intervention – the insertion of a self-deploying stent-graft in the subclavian artery simultaneously with catheter removal.

We have an experience with this procedure in 3 patients. The approach in all cases was through surgically exposed brachial artery.

Case №1. Female patient aged 51 years, diagnosis – myeloma. Intensive chemotherapy necessitated the insertion of 2-lumen catheter in the subclavian vein. The catheter was erroneously inserted into the right subclavian artery. It was decided to insert a self-deploying stent-graft in this artery simultaneously with the catheter removal. A stent-graft 7 – 40 mm (Bard) was inserted into the subclavian artery through the brachial artery (artery diameter 5.3 mm). After stent deployment the catheter was removed. Arteriography revealed incomplete stent apposition to the arterial wall, the wound was bleeding. Another stent (8-40 mm) was inserted and deployed in such a way, that it partially overlapped the previously inserted stent, in addition, balloon angioplasty of the proximal stent's end with 8-40 mm balloon was performed. Contrast examination revealed complete stent's apposition to the arterial walls, the bleeding stopped. No disturbances of the arm functions were seen postoperatively.

Case №2. Female patient aged 65 years, diagnosis – chronic glomerulonephritis. Terminal chronic renal failure. A two-lumen catheter was inserted for programmed hemodialysis. It was revealed, that by error it was inserted in the right subclavian artery. The artery's diameter – up to 6.2 mm. A stent-graft 9-40 mm (Bard) was inserted through the brachial artery and deployed, the catheter was removed. No external bleeding occurred. No disturbances of the arm functions were seen postoperatively.

Case №3. Female patient aged 14 years, a two-lumen 14F catheter for hemodialysis was inserted erroneously катетер 12F in the right subclavian artery. A stent-graft 8-60 mm (Bard) was inserted through the brachial artery and deployed, the catheter was removed. No external bleeding occurred. No disturbances of the arm functions were seen postoperatively. Unfortunately, this patient died from progressive multi-organ failure. At autopsy: the defect in the subclavian artery is completely closed by a stent-graft, there are no signs of bleeding.

In all cases the wounds in brachial artery were sutured after the removal of 10F access introducer.

Conclusions:

1. The insertion of a self-deploying stent-graft into the subclavian artery, after the removal of an erroneously inserted catheter, is an alternative to surgical intervention.
2. The appropriately chosen diameter and length of the stent allow to restore the artery's integrity and avoid the disturbances of the arm function.

RESULTS OF PTCA IN PATIENTS WITH ISCHEMIC CARDIOMYOPATHY, POTENTIAL CANDIDATES FOR HEART TRANSPLANTATION

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Purposes of the study: To evaluate the results of PTCA in patients with coronary heart disease, potential candidates for heart transplantation, and to determine informative value of different parameters of LV structure and function in the assessment of revascularization efficacy in this category of patients.

Methods: The changes in myocardial function after PTCA were assessed by single-photon emission computed tomography with Tc-99m-tetrofosmin synchronized with ECG (Gated SPECT). Cardiac catheterization was used for the assessment of hemodynamic changes.

The study included 37 patients with ischemic cardiomyopathy who admitted for considering possibility of heart transplantation. With the purpose of improvement of myocardial functional condition and providing "bridge" to the heart transplantation, all patients underwent endovascular revascularization of the myocardium at the maximum possible volume.

Results: In-hospital mortality was 2.7%. Three-year survival following the angioplasty was 63% vs. 19% for drug therapy.

After PTCA dyspnea decreased in almost all patients; circulatory insufficiency was reduced by no less than 1 NYHA functional class.

Reduction of LV end-diastolic pressure (EDP) (35.7 ± 9.3 vs. 23.5 ± 9.9) and of pulmonary arterial pressure (PAP) (43.8 ± 12.6 vs. 30.7 ± 7.6 ; $p < 0.01$) was observed after the revascularization. Significant changes in velocity parameters of LV filling and blood ejection after the revascularization (PER – peak ejection rate 378 ± 98 vs. 290 ± 79 , $p = 0.004$; PFR – peak filling rate 380 ± 104 vs. 290 ± 123 , $p = 0.02$; PFR2 – secondary peak filling rate 36 ± 25 vs. 80 ± 69 , $p = 0.03$) were determined as well.

Since all these parameters reflect elastic properties of the myocardium, the observed changes are suggestive of the decrease of its rigidity after the revascularization that also explains reduction of LV EDP, PAP and decrease of dyspnea.

Meanwhile, no changes in main structural and functional LV parameters (ejection fraction, cavity dimensions) were revealed after PTCA. Comparison of Gated SPECT results before and after PTCA also did not reveal significant increase in functioning myocardium mass.

Regression analysis of relationship between the changes in velocity parameters (PER, PFR, PFR2) after PTCA and baseline structural and functional parameters of the LV determined by means of Gated SPECT revealed that the initial amount of irreversibly

affected myocardium was the most reliable predictor of absence of this changes over time ($p < 0.01$).

Conclusion: PTCA in potential candidates for heart transplantation reduces clinical manifestations of circulatory insufficiency and increases their life span. Informative parameters of changes in functional condition of the myocardium were LV EDP, PAP and velocity parameters of LV filling and blood ejection, which we believe to be associated with the improvement of blood supply of the functioning myocardium and increase of its elasticity. The initial amount of the functioning myocardium was the most important predictor of improvement.

COMPARATIVE ANALYSIS OF INFORMATIVE VALUE OF EJECTION FRACTION (EF) AND PARAMETERS OF MECHANICAL ASYNCHRONISM OF THE LEFT VENTRICLE (LV) AS A MEASURE OF THE EFFECTIVENESS OF MYOCARDIAL REVASCULARIZATION

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Mechanical asynchronism is a fundamental phenomenon in the normal heart manifested as the difference in mechanical behavior of heart wall regions in space and time. The scale of mechanical asynchronism significantly increases with the increase in severity of impairment of myocardial contractile function. Meanwhile heart wall regions contribute to blood ejection, which is not the same by volume and at different periods of time. It appears from this that EF estimated only at the time point corresponding to end-systolic volume of LV does not reflect real functional potential of the heart wall regions which are demonstrated its maximal function at different times. In the present study procedure of myocardial revascularization was used as a model demonstrating correctness of the stated opinion. Objective of the study consisted in the investigation of degree of the effect of myocardial revascularization on EF value and parameters of mechanical asynchronism of LV. Detailed analysis of regional function of the heart wall was performed before and after PTCA with stenting in 10 patients with CHD (angina functional class 2-4) using original method of 3D reconstruction of LV based on transesophageal US study of the heart. EF was determined using standard method on the base of LV volumes at the end of systole and diastole. The degree of the mechanical asynchronism was characterized by change over time of 24 pyramids, with the center of LV masses serving as the vertex of each, and corresponding regions of the heart wall – as the base. Ambiguous effect of angioplasty on the EF value was determined, while all parameters of mechanical asynchronism demonstrated significant reduction of its values. Particularly, variation coefficient of 24 regional EF was $28.4 \pm 1.2\%$ and $24.0 \pm 0.8\%$ before and after revascularization, respectively ($p < 0.01$). The conclu-

sion was made, that EF even calculated on the basis of 3D reconstruction of LV has low informative value for the evaluation of efficacy of myocardial revascularization, since it does not consider specificity of regional function of the heart wall.

LONG-TERM RESULTS OF STENTING OF THE LEFT MAIN CORONARY ARTERY

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Purpose of the study: To assess efficacy and safety of endovascular interventions on the left main coronary artery in patients with coronary heart disease (CHD). To assess long-term results of stenting of the left main coronary artery (LCA). To determine the feasibility of the LCA stenting as an alternative option to coronary artery bypass surgery.

Materials and methods: From 1999 till 2007, 83 interventions on the LCA were performed in 76 patients in our department. In 64.9% of cases interventions were performed in patients with stable angina, in 24% – with unstable angina, and in 11.1% – with acute myocardial infarction (AMI). Patients were aged from 42 to 77 years. Most patients were males. Risk factors of CHD were found in 59.2% of patients. Isolated lesion of LCA was revealed in 4 patients (5.2%), lesions of LCA and one coronary artery (CA) – in 16 patients (21%), lesions of LCA and 2 CA – in 29 patients (38.2%); 27 patients had lesions of LCA and 3 CA. Occlusion of the right coronary artery was revealed in 11 patients. Stenting was performed in 74 patients. Drug-eluting stents were used in 36 patients (2 stents were used in 10 cases). In 11 procedures we have used intravascular ultrasound (IVUS) for the determination of stenosis significance, its prevalence and the effectiveness of stenting. Twenty one procedures were performed with support of intra-aortic balloon pump (IABP). Most patients from this group were at high risk of intervention. IIb/IIIa inhibitors were used in 4 procedures.

Results: Success rate of the procedure was 98.68%; there was 1 occlusive dissection of LCX requiring urgent CABG. Mortality was 0%. During in-hospital stage 1 patient experienced non-Q-MI and 1 episode of cerebral-vascular accident. Clinical improvement occurred in 93% of cases.

Pain recurred in 9 patients, 2 patients out of them had pain of non-coronary nature, and 7 patients underwent coronary angiography.

Repeated interventions were performed in 4 patients, 3 out of them (9.6%) in the group of bare stents and 1 (4.3%) in the group of drug-eluting stents.

In the long-term follow-up (6-50 months), 43.4% of patients were successfully examined. Functional tests did not cause myocardial ischemia in these patients. Helical computed tomography was performed in 12 patients from this group; no narrowing of the stented segments of the LCA or its branches was observed.

Conclusions: Stenting of the left main coronary artery proved to be an effective and safe method of treatment of the LCA lesions in patients with CHD. Use of drug-eluting stents allows to improve long-term results of the intervention and to consider the LCA stenting as real alternative for the operation of CABG.

MORPHOLOGICAL FEATURES OF PATENT DUCTUS ATERIOSUS BY IVUS AND THEIR INFLUENCE ON THERAPEUTIC APPROACH

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Endovascular method became the basic mean of correction of one of the most widespread congenital heart diseases – patent ductus arteriosus (PDA). The advent of Amplatzer occluder removed the limitations related to the size of ductus. However accurate measurement of ductus diameter is very important for the selection of the type and size of occluding devices.

In consideration of known limitations proper to quantitative angiographic measurements and related to planar character of the analyzed image, since 2000 we use IVUS for quantitative measurements and qualitative analysis of PDA.

During this period endovascular closure of PDA was performed in 133 patients. 115 examinations of PDA were performed with the use of In-Vision Plus system (86.5% of the total amount of operations). IVUS wasn't used in repeated operations related to the necessity of additional coil implantation and also in very small PDAs which initially needed predilatation with coronary balloon for the insertion of embolization delivery system.

In 80% of cases the diameter of ductus as measured by intravascular ultrasound exceeded angiographic value. The selection of embolizing coil was based on ultrasound data.

From our viewpoint, qualitative particularities of PDA morphology revealed at intra-vascular ultrasonic investigation can be of great clinical value. Approximately in 10% of cases we noted the pulsation of PDA wall with the steady sensor position in duct. In about 1/3 of patients the duct was oval-shaped, which is quantitatively characterized by eccentricity factor exceeding 1.3 (the ratio of maximal / minimal diameter of the duct according to IVUS at the minimal cross-sectional area). At last, in some patients the cross-section shape of PDA was very irregular. This was commonly seen in patients after previous surgical PDA ligation but not limited to these cases. All this morphological situations are unfavorable for endovascular closure of PDA with coils, as, on the one hand, oval or irregular shape of the duct increases the cross-sectional area, complicating lumen closure with thrombus, and, on the other hand, can cause bad coil fixation, especially with marked wall pulsation. Previously in similar situations we simultaneously implanted two coils (if the

duct diameter was less than 3.5 mm), or abandoned endovascular treatment (in larger duct diameters). During the last years such cases were successfully closed with Amplatzer occluder.

Besides, we distinguish three variants of PDA walls visualization for the characterization of its anatomic structure. In half of cases PDA had thin walls without clearly defined internal structure. In 1/3 of patients, especially with big diameter of the duct, wall opacification was sharply decreased which sometimes complicated quantitative measurements. Finally, in 20% of patients the wall had accurate structure, up to three-layer, and sometimes was considerably thickened. According to our analysis, the last variant is unfavorable from the viewpoint of thrombosis development around the coil and persistence of a residual shunt.

Thus, IVUS gives a valuable additional diagnostic information which influences the selection of correction method, of the instruments to be used and also the results of the treatment.

ECG CHANGES IN EARLY POSTPROCEDURAL PERIOD IN PATIENTS AFTER ELECTIVE PERCUTANEOUS CORONARY INTERVENTIONS

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Clinical interpretation of ECG changes in the early postoperative period after percutaneous coronary interventions represents obvious practical interest as their incorrect evaluation can lead to erroneous hyperdiagnostics of acute conditions and influence further treatment tactics, the duration of rehabilitation and the work capacity of patients. At the same time there are no reliable criteria for the interpretation of ECG changes, first of all – of ST-segment and T-wave, after such procedures.

The analysis of ECG of 80 patients subjected to elective PTCA with restoration of TIMI 3 blood supply in target artery (arteries) and absence of angina in the postoperative period was performed. Among patients there were 97.3% of males aged 26 to 71 years (mean, 53 years), and 2.7% of females aged 61 to 73 years. Comparative estimation of ECG data during the main stages of the procedure, as well as during 1-3 days after it, was carried out.

The isolated changes of ST-segment and T-wave, as well as transient rhythm disturbance were non-specific in most cases. However we revealed some regularities depending on the type of endovascular intervention. Recanalization of chronic occlusion with subsequent PTCA and stenting was performed in 39 patients, in 20 of them – in combination with PTCA and stenting of one or two other coronary arteries. In 69.2% of these patients we revealed negative ECG dynamics in the leads related to the territory supplied by the recanalized artery (ST depression, “+” T amplitude decrease or “-” T formation). Negative dynamics was commonly revealed only by the third

day after the procedure. It is worth noting, that ECG changes were more expressed after recanalization of one artery only and appeared already within the first 24 hours or immediately after the intervention in 31.6% of patients of this group. In 21% (4 patients) they became focal and large-focal by the third day. In 3 of these patients, in the absence of clinical complaints, significant increase of AST was found. Control coronary angiography on day 4 confirmed complete preservation of permeability in the area of reconstruction and absence of angiographic signs of coronary lesions.

PTCA with stenting was carried out in 37 patients (46.3%) with stenotic lesions. Different negative ECG changes, which could be interpreted as negative dynamics, were found in 83.7%. Often they were noted immediately after the procedure and then changed to positive dynamics at day 1-2 after one-vessel PTCA, at day 2-3 after two-vessel PTCA. In cases of simultaneous procedure performance in 3 arteries the ECG picture was not reliable, probably, because of the apposition of multidirectional changes from the zones supplied by different arteries. Direct coronary stenting was done only in 5% patients of the study group and were accompanied with minor ECG changes; in 75% of them ECG dynamics was absent or was positive.

Thus, even with optimal angiographical and clinical results of endovascular interventions on the coronary arteries the early postoperative period is characterized by ECG changes. Their interpretation requires attention and critical evaluation in order to exclude eventual diagnostic errors that influence the further treatment. Thereupon it is important to compare postprocedural ECG changes with ECG picture recorded during coronary balloon inflation – a reliable model of ischemia in a given patient.

ROUTINE USE OF THREE-DIMENSIONAL INTRAVASCULAR ULTRASOUND CONTROL IN CORONARY PROCEDURES WITH THE USE OF BIFURCATIONAL STENTS

V.V. Demin, A.V. Demin, S.A. Lavrenko (Orenburg)

Treatment of bifurcational coronary lesions is one of the fields of interventional cardiology which attracts permanent attention and stimulates the search of new technical approaches. Those last years a great interest is aroused by specially designed bifurcational stents. The first bifurcational stents was Multi-Link Frontier; currently bifurcational stents are produced by several manufacturers. The particularities of stents design and technical details of operation require careful estimation of coronary anatomy before the intervention as well as adequate stent positioning and preservation of lateral branch lumen after implantation. In most cases angiography is insufficient for adequate evaluation and intravascular ultrasound study with compulsory third dimension construction is required.

Since 2004 we have operated 19 patients using specially designed stents: in 15 patients – stent Multi-Link Frontier, in 2 – stent Twin Rail and in 2 – Jo-Stent Sidebranch. The first two stents are truly bifurcational – they have different diameters of proximal and distal parts, a special carina for the protection of lateral branch ostium and two balloons in their delivery systems. Jo-Stent Sidebranch is different from “normal” stents because of big diameter of stent cells in the central segment, which facilitates the approach to the lateral branch after the implantation. We have used specially designed stents in cases, when the lateral branch had a diameter was over 2.5 mm and supplied a rather prolonged territory. In 15 cases the intervention was performed in the area of bifurcation of the LAD and a large diagonal branch, in 4 – in the area of bifurcation of the circumflex artery and the obtuse margin branch.

IVUS was used in 14 of these patients (73.7%); on the average we use IVUS during stenting in 21.8% of all patients. So, we can speak about routine IVUS usage in bifurcational stenting. A total of 21 three-dimensional intravascular ultrasonic studies was performed in 14 patients at different stages of intervention: in 11 – at the initial stage (2 of them after predilatation), in 3 – at the intermediate stage and 7 – as the final control.

At initial stage of intervention the third projection of IVUS allows to specify the type of bifurcational lesion due to the visualization of atheromatous masses in relation to lateral branch and vessel circumference, and also to evaluate plaque morphology, in particular, the presence of calcification in the bifurcation area and the extent of calcification in the third view. The quantitative measurements allows to measure diameter of artery in the area of lesion, below and above the lateral branch origin, which is necessary for selection of stent not only of optimal size, but also of optimal design for the given patient. At intermediate and final stages of the procedure the third view of IVUS allows to assess the state of the proximal and distal reference segments after stenting, and to define the necessity of additional manipulations in these sites and the lateral branch. Only IVUS allows to evaluate stent position in relation to lateral branch ostium, the quality of stent deployment and apposition, as well as the necessity for additional angioplasty in the branch ostium or its prolonged stenting.

Thus, routine usage of three-dimensional IVUS at various stages of bifurcational coronary stenting is one of the conditions for the exact and safe performance of the procedure.

PRIMARY AND SECONDARY PERMEABILITY OF THE FEMORAL ARTERIES IN THE LONG-TERM AFTER ENDOVASCULAR INTERVENTIONS

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We analyzed the results of the long-term (over 5 years) follow-up of 165 endovascular procedures on femoro-popliteal segment, performed in 139 patients from 1966 till 2002. Stenting was done in 33 cases (20%). During this period all peripheral stents were implanted not on the elective basis, but only in cases of intraoperative indications. Recanalization of chronic and acute arterial occlusions was performed in 33,7% of cases, including rotor recanalization 22 cases (13,3%) and rheolytic thrombectomy in 16 (9,7%). The patients were followed actively and were recommended to return for control angiographic examination within the first 2 years after the procedure; also we analyzed the results of angiographic and clinical studies of patients who received subsequent care in the Department of vascular surgery. In total, long-term follow-up was completed in 59% of patients.

Restenoses or occlusions of femoral or popliteal arteries were revealed angiographically in 33 cases (20% of all operated patients and 34% of patients who underwent control examination). Repeated endovascular interventions were performed on 21 extremities (12,7%); 12 patients (7,3%) underwent such intervention within the first year after the first procedure, and 5 (3%) – within 2 years. Occlusions and reocclusions of femoral arteries, not suitable for repeated reconstruction, were found in 12 cases (7,3%): within the first 3 years there were 2 such findings per year, 4 cases were revealed during the fourth post-procedure year. At 5 years secondary permeability of the target arteries in the group of dynamically followed patients was over 84%. In many cases angiography revealed good permeability of matrix, as well as of self-deploying stents 5-7 years after the procedure. The arteries stented at a distance exceeding 20 cm, as well as reconstructed on the background of acute thrombosis, are less favorable from the viewpoint of predicted permeability. It is worth noting, that in distinction from vascular surgery, where acute graft thrombosis can lead to the decompensation of circulation, such consequences are extremely rare with restenosis or reocclusion after endovascular revascularization functioning over one year. Only 4 patients (2,4%) from our group underwent amputations 2 to 5 years after the intervention, open direct revascularization in femoro-popliteal segment was necessary in 2 patients. Meanwhile the combination of endovascular and surgical interventions is a justified and frequently used approach for supplementing endovascular reconstructions with palliative interventions influencing the peripheral arteries, and also for revascularization of other segments of the peripheral arteries.

Thus, systemic approach, active dynamic follow-up of patients and the use of endovascular and surgical interventions' potential it is possible to achieve significantly better long-term results after the interventions on femoro-popliteal segment, than it is commonly thought.

LONG-TERM (OVER 5 YEARS) RESULTS OF ENDOVASCULAR INTERVENTIONS ON THE CORONARY ARTERIES

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We have analyzed long-term (over 5 years) results of 557 successful interventions on the coronary arteries, performed in 500 patients in the Department of endovascular methods of diagnostics and treatment of Orenburg Regional hospital from 1996 till 2002. The interventions performed during this period had technical and methodic particularities: frequent use of angioplasty in primary interventions, even after recanalization, and use of stenting only in cases of necessity; use not only of matrix, but also of wire stents; tendency to perform control angiographies in the maximum of cases, even without clinical indications, during the first years of our experience. Accordingly, during the period of study angioplasties often were used as primary interventions, while stenting of the same arterial segments was performed during the repeated procedure, while during the last years we use the reverse approach. In total stents were used in 57,5% of cases (in 45,9% during the period from 1996 till 1999). Recanalization of chronic occlusion was performed in 17%.

Control coronary angiography in different time after the intervention was carried out in 58% of patients, dynamical follow-up for over 3 months with or without control angiography was completed in 73%. During the 1st postoperative year repeated interventions were carried out on 103 vascular segments – 18,5% (including 12 cases with two repeated procedures). Within 1 year CABG was performed in 6 patients, in another 9 cases impermeability of the operated segments was not corrected. Thus, primary permeability of the operated arteries was preserved within 1 year in 78,8% of cases, secondary permeability (apart from revascularization with CABG) – in 97,3%. The subsequent years are characterized by significant decrease of the necessity of endovascular re-interventions, as well as of the rate of operated segments' dysfunction requiring bypass grafting or conservative treatment. By the end of 2nd year after the intervention primary permeability was 75,6%, secondary - 95,7%, by the end of 3rd year – 74,1% and 95,5%, respectively, by the end of 4th year – 73,1% and 95,5%, by the end of 5th year – 72,5% and 95,2%.

Hence, even at the stage of endovascular interventions with limited use of first-generation stents, long-term results are comparable with the available data concerning the results of 100% use of bare stents. Repeated use of endovascular interventions allows to receive very high indices of secondary permeability of the coronary arteries 5 years after the first interventions. The possibilities of repeated revascularization after endovascular procedures are significantly higher than those after cardiac surgery.

SEVERITY OF CORONARY LESIONS AND INDICATIONS FOR SURGICAL TREATMENT IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION DEPENDING ON THE PRESENCE OF ABSENCE OF POSTINFARCTION ANGINA

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Purpose of study: to provide a basis for coronary angiography (CAG) with the aim to determine further treatment tactics in all patients with myocardial infarction (MI) independently of the presence or absence of postinfarction angina (PIA).

Objectives:

- 1) To investigate the severity of coronary lesions on the base of CAG data and the complexity of lesion according to SYNTAX scale in patients with MI in the presence of PIA.
- 2) To investigate the severity of coronary lesions on the base of CAG data and the complexity of lesion according to SYNTAX scale in patients with MI in the absence of PIA.
- 3) To compare the results of CAG in both groups.
- 4) To determine the presence of indications for surgical treatment and to conduct comparative analysis of this characteristic in the groups of study.

Methods: we have studied 120 patients with primary MI. They were divided into 2 groups – with complicated and non-complicated MI course. Only postinfarction angina was considered as complication. Group 1 (n=59) included patients with MI complicated by PIA. Group 2 (n=61) comprised patients without PIA. Both groups were comparable in age, gender, absence of ischemia history, presence of associated pathology. A comparative analysis of the coronary lesion severity as judged by CAG data, a comparative quantitative assessment of the complexity of “surgical” level of coronary lesions in accordance with SYNTAX scale, and the comparison of patients with the indications to surgical myocardial revascularization were carried out.

Results: “Surgical” level of coronary lesions was revealed in 97% of patients in the group with PIA and in 75% in the group without PIA ($p=0.0001$). According to SYNTAX scale, a severe lesion (score 16-28) was present in 29.6% of patients in Group 1 and in 20.4% in Group 2 ($p>0.05$). If all cases were considered, the mean SYNTAX in the group with PIA was 14.2, in the group without PIA – 10.0. The indications for surgical myocardial revascularization were present in 97% of patients in the group with PIA, and in 75% in the group without PIA ($p=0.0001$).

Conclusions:

- 1) The evaluation of coronary lesions using SYNTAX scale revealed comparable character in the groups of patients with and without PIA.
- 2) Patients with PIA prevail in the structure of patients with MI who have indications for surgical myocardial revascularization.

- 3) The number of patients with and without PIA with indications for surgical treatment is comparable.
- 4) It is absolutely necessary to perform CAG in all patients with MI in order to determine further tactics of treatment, independently of the presence or the absence of PIA.

CORONARY ANGIOPLASTY FOR ACUTE CORONARY SYNDROME

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Percutaneous coronary angioplasty is the most effective method of treatment in acute coronary syndrome (ACS). The group of ACS comprises patients with instable angina including early postinfarction angina, as well as patients with acute myocardial infarction without ST elevation. This group of ACS with heterogeneous clinical characteristics has the same morphological substrate – a so-called instable, vulnerable atherosclerotic plaque. The purpose of ACS treatment consists in the “passivation” of atherosclerotic plaque and improvement of myocardial blood supply. PTCA with stenting performed against the background of optimal drug therapy reduces death rate, improves the quality of life and reduces hospital stay. According to different authors, 20 to 40% of stented patients with ACS require repeated interventions within 1 year after the first PTCA because of in-stent restenosis. The use of drug-eluting stents (DES) reduces the risk of restenosis by several times and significantly decreases the need of repeated interventions. However, while suppressing the mechanism of restenosis, DES also inhibit endothelialization process, and in rare cases can lead to acute in-stent thrombosis in the long-term follow-up. Theoretically, the stents delaying endothelialization process at the site of complicated, thrombogenic atherosclerotic plaque in ACS is potentially more dangerous than bare metal stents. This question is insufficiently studied. Also it isn't clear whether the tactics of complete revascularization in patients with multivessel coronary lesions is justified or it would be more appropriate to confine oneself to PTCA of symptom-related coronary artery.

Study objectives: to estimate short- and long-term results of DES use in patients with ACS. Safety and effectiveness of the tactics of complete revascularization in patients with ACS and multivessel coronary lesions were also evaluated.

Material and methods: from March, 2003 till September, 2007, 425 patients with ACS were admitted in the Department of Cardiovascular Surgery of the Center of Endosurgery and Lithotripsy. The study comprised 396 patients, who were followed for 30 days – 3 years. Up to 1-year results were followed in 310 patients, control coronary angiography was performed in 290 patients. The majority of patients were males – 320. Mean age was 67 ± 15 years. Clinical characteristics of patients are presented in table 1.

Table 1

Total	396
Mean age	67±15 years
Male/female	320/76
PTCA of only symptom-related CA	50 (12.6%)
Complete revascularization	346 (87.4%)
Thrombolytic therapy during intervention	5 (1.3%)
Inhibitors of IIb/IIIa GP receptors	79 (20%)

Complete revascularization was performed in overwhelming majority of cases (87.4%). In all cases of PTCA stenting was assumed. In 321 (93%) out of 346 we have used only DES (sirolimus, paclitaxel or everolimus). The stenting only of symptom-related coronary artery was performed mainly in single-vessel lesions. All patients received clopidogrel, aspirin and heparin. In patients who did not receive antiaggregant therapy, the loading of clopidogrel was 300 mg (600 mg during the last year). Inhibitors of platelet GP receptors IIb/IIIa were given at the discretion of the interventionist in 75 (20%) patients.

Results: PTCA was technically successful in 392 patients (99%). In 1 case it proved impossible to recanalize the RCA occlusion.

Three patients died during the intervention, procedural mortality was 0.8%. In 2 cases the intervention was carried out in patients with repeated myocardial infarction, with acute heart failure, in 1 case – in severe exertional and rest angina. Four patients died within the first 30 days after the procedure. In one case an acute thrombosis at the area of LAD bifurcation, with cardiogenic shock development was diagnosed at day 5 after repeated intervention, in the second case the patient died from cardiovascular causes 7 days after the discharge, in the third case – at day 12 day. In two remaining cases the death occurred after antiaggregant therapy withdrawal.

During 1-year follow-up 4 patients (1.0%) from 310 has died. In 2 cases the death was sudden (both patients had decreased left ventricular contractility after anterior myocardial infarction), in the third case death was probably due to cardiovascular causes. In 1 patient the cause of death was not clear. Total 1 year mortality (in-hospital and out-hospital) was 2.8%. Restenosis in the stented area was present in 12 out of 290 patients (3.9%), in-stent restenosis – in 5, marginal restenosis – in 7 patients. Repeated interventions during 1 year were performed in 11 patients.

Conclusion: all patients hospitalized with ACS were included in our study. Due to that group is rather representative. Despite the absence of control group, the rate of mortality and complications is rather low.

Short- and mid-term results of PTCA with the use of DES in patients with ACS are suggestive of the effectiveness of this therapeutic approach. It allows to reduce mortality and the incidence of repeated revascularizations. It will be possible to evaluate long-term results after at least two-year follow-up.

CONTRAST-INDUCED NEPHROPATHY

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Introduction: High-quality and accurate cardiovascular visualization is essential for adequate assessment, treatment and prevention of cardiovascular diseases. Intravenous or intra-arterial administration of radiographic contrast medium (or simply contrast agents) allows to visualize the lumen of the vessels, to reveal the character and precise localization of lesions. Ionic or nonionic iodine-containing contrast agents (CA) which are used for angiography and computer tomography differ not only in chemical structure and molecular weight but in their physicochemical properties. Differences in chemical structure determine different physicochemical properties of CA such as osmolarity and viscosity. Ionic CA has significantly higher osmolarity than nonionic ones. Kidney toxicity is more pronounced with ionic high-osmolar and more viscous CAs. Correspondingly, ideal contrast agent would be isoosmolar nonionic with low viscosity.

Although clinical consequences of CA use are well known many things in pathogenesis of CIN are still unclear. A slight increase of serum creatinine level (0.2 mg/dl or 18 µmol/l on the average) following contrast investigations is quite common. An increase of serum creatinine level by more than 50% from baseline or by more than 1 mg/dl (88 µmol/l) is observed relatively rarely, mainly in presence of several risk factors (2, 9). On the whole, CIN develops significantly more often when renal dysfunction exists. The risk factors for CIN development are diabetes mellitus, chronic kidney diseases, arterial hypertension, heart failure, acute myocardial infarction, dehydration, use of nephrotoxic agents. Some risk factors for CIN, such as dehydration, can be easily eliminated before contrast administration. In cases with several risk factors combination the threat of CIN is greatly increased.

Hydration is a common measure for CIN prevention. It is shown that with intravenous hydration the average decrease of glomerular filtration is lower as compared with water ingestion.

Urine alkalization may neutralize free radicals in renal tubules. Favorable effect of alkalization for CIN prevention was shown in two studies, and it is still too early to recommend it for general use.

N-acetylcysteine (ACC) having antioxidant and vasodilatory action decreases risk of CIN development. There are data suggesting that high doses of ACC are far more effective than those used in previous randomized studies (1800 mg daily). In general, clinical studies using high total doses of ACC (>4000 mg daily) have shown significant decrease of CIN incidence.

Ascorbic acid was also studied as agent for CIN prevention due to its antioxidant effect, however its effectiveness is not yet proved.

Theophyllin and aminophylline were also used in order to decrease the risk of CIN. Meta-analysis of trials concerning this issue showed that antagonists of adenosine receptors decrease risk of CIN as compared to placebo. However, it is hard to interpret unambiguously these data due to heterogeneity of groups included in different trials and because of the fact that none of agents showed clinically significant efficacy in prevention of CIN.

The type of X-ray contrast agent also may affect the renal function. Previously, risk of CIN development was high when high-osmolar ionic CA were used. With the development of modern nonionic low-osmolar CAs this risk decreased significantly. According to integrated data of comparison of high-osmolar CA with low-osmolar ones, the latter contributed to the decrease of CIN risk.

Preliminary results of the clinical trial: A uniform protocol for CIN prevention is accepted in the Department of cardiovascular surgery of the CELT clinic. Plasma creatinine level is determined in all patients before endovascular intervention and than twice, 24 and 48 hours after endovascular intervention.

Active hydration of patients is implemented after physical examination. It implies unlimited fluid intake before administration of CA and i/v infusion of physiological saline at a rate of 1 ml/kg/min from the beginning of intervention and within 24 hours. Hydration is implemented at a rate of 0.5 ml/kg/h in patients with low ejection fraction (below 40%) and congestive heart failure. In patients with initially increased creatinine level i/v administration of fluids is started 2-12 hours before the intervention and continues for 48 hours; additionally acetylcystein is administered to such patients for 2 days at a dose of 1200 mg.

Study objective was to assess the influence of different contrast agents on serum creatinine level during percutaneous endovascular interventions.

In order to study the influence of different CA on kidney function during endovascular interventions the patients were randomized into 4 groups Group 1: endovascular interventions performed using Iodixanol (Visipaque); Group 2: endovascular interventions performed using Iohexol (Omnipaque); Group 3: endovascular interventions performed using Ioversol (Optiray); Group 4: endovascular interventions performed using Iopromide (Ultravist).

Clinical endpoints: increase of plasma creatinine level during in-hospital stay by 25% from baseline; progression of renal failure within 1 year after intervention. Secondary clinical endpoints: survival rate within 1 year after intervention; survival rate, repeated hospitalizations and interventions within 1 year after primary intervention.

Material and methods: from March 15 till December 19, 2007 a total of 209 patients was randomized. The study comprised 201 patients. Patients who underwent contrast examination or intervention twice during 24 hours (n=6) were excluded from this analy-

sis. This preliminary report presents data from 152 patients who were followed for 30 days after the discharge. Group 1 comprised 38 patients, Group 2 – 42, Group 3 – 40 and Group 4 – 32 patients. CIN was defined as serum creatinine level increase by more than 25% from baseline. Groups did not differ significantly by number of severe concomitant diseases such as diabetes mellitus, arterial hypertension and by frequency of renal dysfunction before the intervention. Body weight index was higher in group of Iohexol as compared to other groups.

Results: Mean volume of administered CA per patient was slightly lower in groups of Iodixanol and Iopromide (289 and 291 ml, respectively) than in groups of Iohexol and Ioversol, however, the difference was not statistically significant. Mean calculated amount of CA per patient was highest in Iohexol group (319 ml); however, patients with body weight index above 25 prevailed in this group as well (mean group BWI 35.0) which did not reveal significant difference during correlation analysis. Groups did not differ by creatinine clearance level calculated using Cockcroft-Gault formula. CIN was observed in patients with initial renal dysfunction in overwhelming majority of cases (in 5 out of 8 patients). CIN incidence differed and was 4.7% in Iodixanol group, 11% in Iohexol group, 6.5% in Ioversol group and 10% in Iopromide group. CIN was significantly less common in group 1 and in group 3. However, in one patient out of 2 with CIN from group 3 (Ioversol), we revealed CRF progression which ultimately necessitating chronic dialysis. Thus, it is hard to say about significant difference in CIN severity between groups 2, 3 and 4. The results of the long-term follow-up will be analyzed after 1 year.

Conclusions: We noted low incidence of renal dysfunction after use of isoosmolar CA. Relatively low incidence of CIN development in our cases is explained by the fact that the number of patients with baseline renal dysfunction was not too large in all compared groups. Maintenance of CIN prevention measures also seemed to play important role in prevention of renal dysfunction. At this stage we may conclude that modern low-osmolar and isoosmolar CA are well tolerated by patients, complications associated with their use are rare. Simple prophylaxis measures permit to prevent CIN development in the majority of cases.

RESULTS OF ENDOVASCULAR METHODS IN THE TREATMENT OF CRITICAL ISCHEMIA OF LOWER EXTREMITIES IN PATIENTS WITH DIABETES MELLITUS

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Study objectives: to show the effectiveness and the feasibility of endovascular revascularization in patients with diabetes mellitus (DM) and chronic critical ischemia of lower extremities.

Material and methods: 73 patients (35 males (49.7%), 38 females (52.1%)) with diabetes mellitus (82% of patients) aged from 34 to 88 years (mean age 64.2 ± 8.8 years) and chronic critical ischemia of lower extremities (3 and 4 stages on Fontaine–Pokrovsky classification) in 78 legs. Medical history before hospitalization was from 2 weeks to 8 months, the history of lower limbs ischemia – from 6 months to 15 years, in a considerable part of patients (58.2%) the ischemia of lower extremities debuted with critical ischemia manifestations.

Within this group the 3rd stage ischemia was revealed in 13 legs (16.7%), 4th stage ischemia – in 65 (83.3%). The degree of ulcero-necrotic feet lesions was estimated in accordance with Wagner scale: the 1st degree was revealed in 18 cases (27.7%), the 2nd degree – in 13 cases (20.0%), the 3rd degree – in 13 cases (20.0%), and the 4th degree – in 21 cases (32.3%).

Significant stenosis and occlusion were revealed by angiography in 142 arterial segments of lower extremities. The isolated lesions of arterial segments were present in 20 cases (25.4%), with calf arteries lesions making a considerable proportion of them – 65%. Multilevel lesions of lower limbs arteries were revealed in 58 cases (74.3%), with the vast majority occurring in calf and foot arteries – 56 cases (96.5%). In total, lesions of calf and foot arteries were found in 97.4%.

In total, 78 endovascular interventions (EI) including guide recanalization and balloon angioplasty with or without stenting were made. EI were performed in 172 arterial segments, 81 stents were implanted: 3 in the iliac segment, 29 in the superficial femoral artery; 21 in the popliteal artery, 28 in the calf arteries. Intima dissection hindering the blood flow, as well as residual stenosis >30% were considered indications for stenting.

Results: amputations at foot level were performed after EI in 16 cases (20.5%), above the ankle joint – in 1 case (1.3%). Primary preservation of the extremity's supportive capacity was achieved in 77 cases (98.7%). No death occurred within the first 30 days after the procedure. Post-EI complications were seen in 3 cases (4.6%): 2 – bleedings from the puncture site, 1 acute thrombosis of calf arteries. Complications did not affect the outcome.

Conclusion: endovascular interventions in patients with ulceronecrotic lesions of feet and diabetes mellitus, in the presence of lower limbs ischemia and severe associated pathology is an effective and feasible method allowing for leg salvation from high amputation and for mortality decrease.

TRANSPLANTATION OF ALLOGENIC CELLS IN THE TREATMENT OF DILATATIONAL CARDIOMYOPATHY

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Transplantation of allogenic cells for the treatment of certain autoimmune and inherited diseases becomes more and more widespread. Culture of bone marrow multipotent stromal cells (MSC) is most frequently used as cell transplant, since immunomodulating and anti-inflammatory activity of these cells have been proved. Idiopathic dilation cardiomyopathy (DCM) is inherited disease related to mutations of a number of genes; therefore, use of autogenic cells is hardly advisable. Theoretical possibility of induction of recovery of myocardial contractive elements has a critical importance in transplantation of bone marrow allogenic MSC.

Purpose. Evaluation of efficacy and safety of transplantation of allogenic prenatal MSC in treatment of chronic heart failure (CHF) in patients with DCM.

Methods. The study included 7 patients with idiopathic DCM who received prenatal MSC. Patients NYHA functional class was 3.3 ± 0.76 . For the evaluation of efficacy of cell transplantation, changes in patients' functional status (by results of 6-minute test), LVEF value, and BNP level were determined. Cell transplants as suspension of 1 billion cells were administered intracoronary at flow rate of 100 ml/h. Examination of patients was performed at outcome and then in 1, 3 and 6 months after transplantation.

Results. No complications associated with transplantation were observed. Improvement of patients' functional status was observed, thus, distance of 6-minute test certainly increased from 171.4 ± 146.8 m to 324.49 ± 185.99 m, i.e. on 89.2%, FC by NYHA decreased from 3.3 ± 0.76 to 2.14 ± 1.34 , LVEF also increased, but difference was not statistically reliable. Dynamic change of BNP level (brain natriuretic peptide) was especially indicative, as it reduced from 1089.36 ± 602.97 pg/ml to 541.34 ± 335.34 pg/ml already within the first month.

Conclusions.

1. Intracoronary administration of allogenic cells is clinically effective and safe procedure.
2. Transplantation of bone marrow allogenic prenatal MSC is providing improvement of clinical and functional condition in patients with DCMP.

Obtained encouraging results have let us to begin study on transplantation of allogenic MSC derived from adult donors to patients with DCMP.

IMMEDIATE RESULTS OF ENDOVASCULAR TREATMENT OF ONE VERTEBRAL ARTERY IN THE PRESENCE OF AN INTACT SECOND ARTERY

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Purpose: to determine the effectiveness of endovascular treatment of one vertebral artery in the presence of an intact second artery.

Material and methods: from May 2006, 65 balloon-deployable stents have been implanted into the vertebral arteries in 65 patients. Four patients (6.7%) had a history of ischemic stroke in the vertebral arteries pool, 40 patients (61%) had a "vertebrobasilar arterial system" syndrome (vertebro-basilar insufficiency, VBI), 21 (32.3%) patients had coronary heart disease (CHD) and those underwent stenting of the vertebral arteries as a stage of preparation to CABG. In 8 (12.3%) patients PTA of the vertebral arteries was performed simultaneously with carotid arteries stenting. In 62 (95.4%) patients the stents were implanted in the ostial and peristial segments, in 3 (4.6%) – into the intracranial segments of the vertebral arteries. In 3 (4%) cases angioplasty was performed on hypoplastic ($d < 3$ mm) vertebral arteries, ending by the posterior inferior cerebellar artery (PICA).

Results: angiographic effect was achieved in 100% of cases. Mortality was 1.5%: in 1 patient an acute in-stent thrombosis developed in the 1st day after the procedure in the ostial segment of the right vertebral artery, CT scans revealed infarction of the right cerebellar hemisphere. In patients with CHD ($n=21$) who underwent stenting of the vertebral arteries prior to open-heart surgery under EC, no cerebral circulation disturbances (CCD) in the vertebrobasilar territory were seen during and early after the operation.

Control angiography was performed in 24 (37%) patients 3 to 8 months after PTA. Any of them did not need repeated stenting. Balloon angioplasty of severe restenoses was performed in 2 (8.3%) patients, 1 patient (4%) developed in-stent occlusion, not leading to severe neurological disturbances.

Conclusions: endovascular stenting of the vertebral arteries is an effective and rather safe method of treatment. Stenting of the vertebral arteries effectively prevents CCD development during and early after the operation in patients in whom open-heart surgery under EC is planned. We believe, that it is necessary to use objective diagnostic methods, allowing for the evaluation of brain perfusion reserve, for the determination of indications for the stenting of a damaged vertebral artery in the presence of intact second artery.

INFLUENCE OF CORONARY STENT IMPLANTATION PRESSURE ON EARLY AND LONG-TERM RESULTS OF PERCUTANEOUS CORONARY INTERVENTIONS

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Purpose of study: to evaluate immediate and long-term results of coronary stenting with the use of high pressure tactics.

Material and methods: the study comprised 934 patients with clinically significant coronary lesions.

The patients were divided into 2 groups: with low-pressure stent dilatation (Group 1, $n=466$) and with high-pressure stent dilatation (Group 2, $n=468$). The implanted stents are widely used in our routine practice – Multi Link stent, Flex Master F1 (Abbot Vascular). Implantation pressure within the limits of 15-20 atm. was considered as "high", the pressure from 8 to 13 atm. used for safe dilatation, in conformity with rupture pressure of the balloon catheter, – as "low".

Results: no cases of coronary arteries perforation or other life-threatening complications were seen during stenting in patients included in the study. During 30-days follow-up unfavorable side effects (complications) were seen in 2.8% of cases in high pressure group and in 3.0% in low pressure group. The patients without unfavorable side effects (complications) within the first 30 days were selected for further study of long-term results (6 months). Such study, including control coronary angiography, was performed in 372 (83%) patients from high pressure group and 370 (82.2%) patients from low pressure group. The incidence of restenoses in high pressure group was 30.4%, in low pressure group – 31.4%, however the incidence of total occlusions of the stented segments in high pressure group was 3.8%, while in low pressure group – 5.9%. During 1-year follow-up main clinical parameters were not significantly different between the groups, cumulative index including absence of Q-wave MI and repeated interventions in high pressure group was 78.8%, in low pressure group – 75.5%. Repeated PTCA was performed in 67 (14.3%) patients in high pressure group and in 78 (16.7%) patients in low high pressure group

Conclusion: the incidence of in-stent thromboses during 30 days after the intervention in high pressure and in low pressure groups is not statistically different. The incidence of early complications (death, Q-wave MI, repeated revascularizations) in the groups with different stent implantation pressure is also comparable.

The study of the group with high pressure of coronary stent implantation revealed positive tendencies in clinical outcomes during 1 year of the follow-up, however without statistically significant difference.

The intervention requires flexible approach, timely evaluation of a dynamically developing situation, the application of a wide spectrum of pressures to the balloon catheter, depending on the experience accumulated with such interventions performance and the character of coronary lesions.

INFLUENCE OF TEMPORAL FACTOR OF AMI CLINICAL PICTURE ON LV EJECTION FRACTION AFTER URGENT MYOCARDIAL REVASCULARIZATION USING PTCA

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Purpose of study: to evaluate the influence of the factor of time elapsed between the onset of acute myocardial infarction (AMI) and the performance of endovascular intervention on the changes of myocardial contractility in early postoperative and long-term periods.

Material and methods: from February 2006, 1109 patients were treated on emergency basis in the Department of Endovascular Diagnostics and Treatment. All these patients underwent coronary angiography (CAG).

Clinical laboratory and instrumental signs of AMI were revealed in 710 (64%) patients, clinical picture of ACS – in 399 (36%) patients. 102 patients with AMI (14.4%) received conservative therapy and thrombolysis, 28 (4%) underwent CABG, 580 (81.6%) – emergency PTCA.

For the purposes of this study we have formed 3 groups with 50 patients in each of them. Group 1 comprised the patients who underwent emergency PTCA of one “infarct-related” artery within 6 hours; the patients from Group 2 had their PTCA within 6-12 hours, and the patients from Group 3 – after 12 hours. All patients underwent EchoCG prior to the intervention, in early post-procedural period and during planned out-patient examination 1 – 1.5 months after the discharge.

Results: before the intervention EF varied: in Group 1 from 35 to 48 (mean, 41.6 ± 4.2), in Group 2 from 30 to 55 (mean, 43.9 ± 5.1), in Group 3 from 20 to 48 (mean, 39.5 ± 5.8). The duration of in-hospital stay varied from 3 to 19 days (on the average – 7 days). By the moment of discharge, after the intervention, EF varied: in Group 1 from 38 to 55 (mean, 49 ± 4.7), in Group 2 from 30 to 55 (mean, 46.9 ± 4.2), in Group 3 from 34 to 52 (mean, 43.8 ± 5.6). EF increased by the time of the discharge in Group 1 by 7.4 ± 1.2 (17.8%), in Group 2 by 3 ± 0.9 (6.8%), in Group 3 by 4.3 ± 1 (10.8%) as compared with baseline values. EchoCG, performed during out-patient examination 1-1.5 months after the discharge showed EF in Group 1 varying from 38 to 56 (mean, 53.3 ± 3.3), in Group 2 – from 34 to 57 (mean, 49.6 ± 4.7) and in Group 3 – from 38 to 59 (mean, 49.7 ± 2.1), respectively. At 1-1.5 months ejection fraction in Group 1 increased on the average by 4.3 ± 0.7 (8.8%), in Group 2 – by 2.7 ± 0.6 (5.8%), in Group 3 – by 2.9 ± 0.7 (6.6%) as compared with the results at the discharge.

Conclusions: myocardial revascularization with PTCA performed urgently as early as possible after the onset (within 6 hours) allows to minimize the consequences of acute myocardial infarction and provides better myocardial contractility in early post-procedural period. In the long-term (1-1.5 months) the difference in EchoCG indices between the groups is not significant.

RESULTS OF CORONARY STENTING IN PATIENTS WITH AMI

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Purpose of study: analysis of the results of stenting in patients with AMI.

Material and methods: from February 2006 till December 2007, 1109 patients with AMI or ACS have been treated in the Department of Endovascular Diagnostics and Treatment. ACS was found in 399 among them (36%), AMI – in 710 (64%). Patients' age varied from 30 to 70 years (mean, 54 ± 5 years). 89% were men, 11% – women. All patients underwent CAG. In 155 patients (13.9%) minimal lesions of the coronary vessels were revealed – they required conservative treatment and dynamical observation. CABG was performed in 189 patients (17%) with ACS and AMI. 85 (12%) patients with AMI underwent thrombolysis and/or multi-component conservative treatment for AMI.

Endovascular interventions were performed in 712 patients (64.2%), among them 580 patients (81.5%) had AMI (including 86 patients with multi-vessel disease who underwent PTCA of the infarct-related artery), and 132 patients (18.5%) had ACS.

PTCA with stenting was performed in 561 patients (97%), without stenting – in 19 patients (3%) with AMI. Total number of implanted stents was 640, including 124 (19.4%) drug-eluting stents.

During the same period emergency PTCA of the left main coronary artery was performed in 17 patients for AMI for vital indications. In total 24 stents were implanted – 21 drug-eluting (87.5%) and 3 (12.5%) bare stents.

Results: angiographic success of PTCA in AMI patients was 96.9%. Mortality in patients with AMI who underwent PTCA was 3.2% (19 patients, among them 2 after PTCA of the LCA on the background of pulmonary edema). In-stent thrombosis was revealed at CAG in 7 (1.2%) cases (in one case drug-eluting stent was concerned), and required balloon stent dilatation, in most cases with IVUS. After PTCA all patients were followed by a cardiologist, and in 78 cases of angina recurrence (13.4%) control CAG was carried out. Restenosis was revealed in 21 patients (27%, or 3.6% of the total number), in 19 of whom bare stents had been implanted. 12 patients did not take clopidogrel for different reasons.

Conclusions: emergency CAG and PTCA are the methods of choice in patients with AMI and allow to significantly improve the prognosis of further course of the infarction, the quality of life and the survival in such patients. In cases of AMI in the presence of multi-vessel coronary lesions it is preferable to perform PTCA of only one infarct-related artery.

The care should be provided on a 24-hours basis in special medical institutions of cardiosurgical profile, equipped with all necessary instruments and consumable material.

In order to improve long-term outcome in patients with AMI after PTCA, it is advisable to implant drug-eluting stents during emergency PTCA. Also it is necessary to carry out adequate antiaggregant and anticoagulation therapy in the early postoperative period, as well as the rehabilitation stages.

COMPARATIVE ASSESSMENT OF DIFFERENT TYPES OF URGENT CARE FOR THE NEONATES WITH PDA-DEPENDENT DEFECTS, EFFECTIVENESS, ALTERNATIVE!

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Purpose: to evaluate the results of urgent interventions in critically ill neonates with heart defects with ductus-dependent circulation.

Methods: from January 2003 till December 2007 we have performed 31 interventions in neonates with heart defects with ductus-dependent pulmonary circulation. The patients were aged 1 to 4 days, their weight varied from 1.9 to 3.7 kg, critical hypoxia (saturation 56–70%) was present in 12 patients, 21 patients received prostaglandin E1 infusion. Fourteen patients underwent direct PDA stenting. The operation of systemic-pulmonary anastomosis creation was performed in 17 cases. Rashkind procedure was performed in 2 patients with restrictive patent foramen ovale (PFO). The interventions were performed in heart defects with ductus-dependent pulmonary circulation (pulmonary arterial atresia (PAA) with VSD, single ventricle with PA stenosis or atresia, etc.)

Results: in total, after all the above-mentioned interventions 12 patients died (total mortality 38.7%). Five patients died after PDA stenting (mortality 35.7%): 1 patient (7.1%) died at day 2 from femoral artery rupture, retroperitoneal bleeding and hemorrhagic shock; 1 patient (7.1%) – from the thrombosis of the stent in PDA; in 3 patients (21.4%) myocardial weakness developed two days after the procedure. Seven patients died after the operation for the creation of systemic-pulmonary anastomosis (mortality 41.1%): 3 (17.6%) – from myocardial weakness, 2 (11.7%) – from multi-organ failure, 2 (11.7%) patients developed lethal sepsis 15–18 days after the procedure. The complications observed after the operation for the creation of systemic-pulmonary anastomosis included shunt thrombosis in 2 cases (11.7%), which required repeated operation for thrombectomy. After PDA stenting there was 1 case of stent thrombosis (7.1%) requiring repeated PDA stenting. The dura-

tion of hospital stay varied from 1 to 40 days (mean – 12.5 days).

Conclusions:

1. Endovascular procedure of PDA stenting and the operation for the creation of systemic-pulmonary anastomosis are effective methods of urgent interventions for the defects with ductus-dependent pulmonary circulation.
2. High mortality of the above methods is caused by critical state of the patients.
3. Each group of interventions has its typical complications: femoral arteries injury with PDA stenting; septic complications after the operation for the creation of systemic-pulmonary anastomosis.
4. The procedure of PDA stenting is the method of choice in critically ill patients. The use of this procedure allows to stabilize the state of patients, thus improving the results of subsequent surgical treatment.

INFLUENCE OF PATIENTS' GENDER ON RESTENOSES DEVELOPMENT AFTER CORONARY STENTING FOR CORONARY HEART DISEASE

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Purpose: the study of the influence of patients' gender on the incidence of restenoses development after coronary stenting.

Material and methods: the study comprised 4374 patients, 1025 women and 3349 men, who underwent coronary stenting. The interventions were performed in accordance with the standard technique with necessary concomitant antiaggregant therapy. If it was possible, control coronary angiography was performed in all patients within 6 months after the procedure.

Clinical follow-up included out-patient examination 1 month, 6 months and 1 year after the intervention. As compared with men, women were about 5 years older and had worse clinical characteristics, but less myocardial infarctions and CABG surgery in their history. Diabetes mellitus and the lesion of the LAD were significantly more common in women. Similar stents were implanted in men and women. In both groups stenting was successful in 98.9% of cases.

Results. Cumulative 30 days index of unfavorable events, including death and AMI, was 3.2% in women and 1.8% in men. Urgent repeated PTCA were more commonly performed in women than in men (3.0% vs. 2.2%).

The risk of restenosis development in women was lower than in men (28.9% and 33.9%, respectively). Critical degree of restenosis (>75%) was less typical

for women, than for men (17.2% vs. 21.1%). The differences in the incidence of restenosis development in men and women concerned only patients without diabetes mellitus. In the subgroup with diabetes mellitus the incidence of restenoses was 36.8% in women and 36.1% in men, while without diabetes restenoses were registered in 26% of women and in 33.5% of men.

By 1 year mortality among women was 5.2%, among men – 4.5%. Cumulative index of unfavorable events, including death and MI was 7.2% in women and 6.0% in men. Clinical incidence of restenoses was lower among women (14.8% vs. 17.5% in men). 15.4% of women and 17.9% men complained of angina. 1 year mortality among patients who did not undergo control coronary angiography was 10.0% in women and 12.3% in men, and the incidence of repeated revascularizations – 1.7% and 3.7%, respectively.

Conclusion. Female patients have lower risk of restenosis development after PTCA. Women have higher risk of complications development within the first 30 days after the intervention, and are more predisposed to thrombotic complications. After 30 days the results in women become better than in men, due to lower incidence of restenoses development.

We revealed negative influence of diabetes mellitus on restenoses development, especially in women. For this reason female patients with CHD associated with diabetes mellitus must receive an optimized, personalized antiaggregant therapy in for the improvement of general results of invasive coronary methods.

POSSIBILITIES OF INTERVENTIONAL CARDIOLOGY AND ANALYSIS OF MORTALITY FROM ACUTE MYO-CARDIAL INFARCTION

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The analysis of lethal outcomes due to acute myocardial infarction (AMI), account-ing for the incidence of stenotic coronary atherosclerosis, the presence of a thrombus in the artery lumen and the extension (area) of the AMI, performed on the base of the data of the joint prosectorium of the Sklifossovsky Institute of Emergency Medicine (over 230 deaths from CHD, including over 100 from AMI) gave the following results.

An **extensive** AMI (with the area exceeding 30% of the left ventricle) was revealed in 78% cases. Primary AMI accounted for 70%, repeated – for 30%. As a rule, an extensive AMI develops in the presence of multivessel lesion of the left and right coronary arteries (CA) branches (78% of cases), with atherosclerotic stenosis affecting not only proximal and middle segments, but, quite commonly, distal segments of the coronary circulation. The incidence of CA thrombosis in these cases is not high (58.7%). Mean age of patients of both sexes was 63.8 years. However, in 22% of the cases with isolated atherosclerotic steno-

sis, as a rule, associated with the thrombosis of CA lumen, and leading to the development of an extensive AMI, especially when the process is located in the proximal third of the LAD, we noted the prevalence of males of working age. The death in such patients is caused by true cardiogenic shock, especially with the involvement of the right ventricle into the infarction, by arrhythmic shock, by acute left ventricular failure inc cases of process spreading onto the papillary muscles.

22% of patients died from **non-extensive** AMI (area < 30% of the LV). In 67% of cases there was a primary AMI. In 68% of the observed cases it developed in the presence of an isolated atherosclerotic stenosis in the proximal segment of one branch of the CA, commonly the RCA, associated with a thrombus occluding its lumen (83% of cases). The most frequent cause of death in these patients was external heart rupture or other disease (commonly – hypertension, diabetes mellitus, etc.) decompensation.

The **repeated** AMI is characterized by extensiveness (the area over 30% in 88% of cases) in the presence of a normally small scar (up to 15% of the area) from a previous infarction.

Thus, an extensive AMI with multi-vessel CA lesion was present in 78% of the lethal outcomes, so unfavorable prognosis was predetermined. Only an active introduction of interventional cardiological methods used **before AMI development, for its prevention**, can really contribute to the decrease of mortality in this contingent of patients. It's especially true for the cases of favorable AMI outcome, in view of a high possibility of a repeated extensive and fatal myocardial infarction. It also concerns the cases with local LAD stenosis, leading, as a rule to the development of an extensive AMI.

COMPARATIVE ANALYSIS OF THE CORRECTION OF BIFURCATIONAL CORONARY LESIONS DEPENDING ON THE METHOD OF STENTING AND THE USE OF DRUG-ELUTING STENTS

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Purpose of study: the comparison of early and long-term results of the stenting of bifurcational coronary lesions depending on the technique of percutaneous coronary angioplasty (PTCA) (simple or complex technique) and the use of drug-eluting stents (DES).

Material and methods: we compared early and long-term results of endovascular correction of bifurcational coronary lesions in the groups of patients who received bare metallic stents (BMS) – Group I (n=93), and DES – Group II (n=106). Simple technique of intervention was used in 56% of patients in Group I and in 82% of patients in Group II. PTCA was performed in the LAD territory in 57% and 60% of cases in Groups I and II, respectively, in the RCA

territory – in 12% and 17% , in the CxB territory – in 20% and 19% of cases, respectively. Mean diameter of the main vessel in Group I was 3.44 mm, in Group II – 3.53 mm (NS). The lateral branch diameter was 2.3 mm and 2.4 mm, respectively (NS).

Results: the success rate of PTCA was 92.5% in Group I and 100% in Group II. The complications (death, myocardial infarction, necessity of CABG) occurred in 4.3% of cases in BMS group and were not encountered in DES group. Long-term results of PTCA (6-12 months after the intervention) were followed in 66% of patients in BMS Group and in 48% of patients in DES Group. Positive clinical effect (decrease of angina functional class by 2, or its resolution, or negative result of stress testing) was noted in 77% of patients in Group I and in 84% of patients in Group II (NS). In the long-term angina was absent in 60% of patients in BMS Group and in 84% of patients in DES Group ($p<0.05$). Re-intervention in the target stenosis was performed in 22.6% of patients in BMS Group and in 2.9% of patients in the BMS\DES Group ($p<0.05$).

Conclusions:

1. Simple technique of stenting combined with the use drug-eluting stents is a safe and effective method of revascularization in patients with bifurcational coronary lesions
2. The use of drug-eluting stents combined with the simple stenting technique in the treatment of bifurcational stenoses contributes to reliable decrease of re-stenosis incidence and of re-intervention need, as compared with the use of bare metallic stents and more frequent use of complex technical approaches.

PCI IN THE TREATMENT OF PATIENTS WITH "DIFFICULT" MULTIVESSEL CORONARY LESIONS

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Study purposes: estimation of safety and effectiveness of endovascular strategy in the treatment of patients with "difficult" multivessel coronary lesions.

Material and methods: occlusions and/or bifurcation and/or prolonged stenosis of two or three coronary arteries (CA) with 20 and more points of severity index under The SYNTAX Score scale which considers localization and morphological characteristics of CA stenoses were considered as "difficult" multivessel lesions. Short- and long-term results of percutaneous coronary interventions (PCI) in 17 patients with "difficult" multivessel lesions were analyzed. Three-vessel coronary lesion was present in 10 (59%) patients, two-vessel – in 7 (41%). Coronary occlusion was diagnosed in 12 patients (71%). Four patients (24%) had clinical picture of instable angina, whereas 13 patients (76%) were in stable angina. In 41% of cases ($n=7$) bare metal stents (BMS) were

used, drug-eluting stents (DES) or a combination DES+BMS were applied in 59% of patients ($n=10$). Mean quantity of stents implanted to each patient was 3.11. Mean length of stented segments was 64.9 ± 24 mm.

Results: the interventions were effective in 100% of cases. The complications as death, myocardial infarction or emergency coronary bypass grafting weren't registered, however in 1 patient PCI was complicated with LAD dissection necessitating additional stent implantation. Total myocardial revascularization was reached in 59% of cases ($n=10$). The long-term results (6-12 months after PCI) were followed up in 71% patients ($n=12$). In the long-term follow-up 75% of patients ($n=9$) were free of angina symptoms. Exertional angina of II-III FC was found in 3 patients (25%). In 1 case it was caused by in-stent re-stenosis (BMS) that demanded reintervention in the target stenosis, in two others – by incomplete myocardial revascularization in the presence of postinfarction left ventricular aneurysm. Coronary artery bypass grafting with left ventricular aneurysm resection was performed in this patient.

Conclusions: percutaneous coronary intervention is an effective and safe method of total or partial myocardial revascularization in patients with "difficult" multivessel coronary lesions.

ACTUAL EXPERIENCE WITH CORONAROGRAPHY AND HELICAL COMPUTED TOMOGRAPHY OF THE HEART IN DIAGNOSIS OF CORONARY INVOLVEMENT IN A PATIENT WITH TOTAL KINKING OF THE AORTA

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Study purpose: the analysis of the possibilities of helical computed tomography (HCT) of the heart in diagnostics of coronary involvement in patient with total kink of aorta.

Materials and methods: the analysis of medical case of a patient after Q-wave anterior myocardial infarction complicated by left ventricular aneurysm is cited. The diagnostic procedure was extremely complicated by total kinking of the aorta. It was impossible to catheterize the RCA ostium and to visualize this vessel. HCT of the aorta and heart was performed.

Results: the results of HCT allowed to exclude aortic aneurysm, to confirm subtotal proximal stenosis of the LAD, and to reveal 55% stenosis of the middle third of the RCA. The obtained data served as a basis for the determination of necessary extent of heart surgery.

Conclusion: HCT of coronary arteries is an additional qualitative and quantitative diagnostic technique for the diagnostics of coronary involvement in situations when invasive coronary angiography is difficult or impossible to perform.

PERCUTANEOUSLY IMPLANTABLE "PORT-CATHETER" SYSTEMS FOR PROLONGED REGIONAL CHEMOTHERAPY OF LIVER METASTASES: PARTICULARITIES OF POSITIONING, USE, COMPLICATIONS

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Study objectives. To show the particularities of implantation and application of percutaneously implanted systems "port-catheter" (PISPC) for long chemotherapy in hepatic artery in patients with non-resectable liver metastases of colorectal carcinoma (Mts CRC).

Material and methods. Since May 2005 till November, 2007, PISPC implantation was performed in 21 patients (13 men and 8 women aged 45 – 60 years) with non-resectable liver Mts CRC. From 1 to 6 cycles of chemotherapy by hepatic artery infusion (CCAI) through the angiographic catheter were performed in all patients before PISPC implantation for verification of the effectiveness and reasonability of further cycles of CCAI.

In X-ray operating room equipped with angiography complex, a puncture of the femoral artery was performed. PISPC installation consisted of the following steps: diagnostic visceral angiography; gastroduodenal or right gastroepiploic artery catheterization; replacement of diagnostic catheter by permanent (infusion) catheter; connection of infusion catheter to silicone catheter and arterial port chamber; percutaneous implantation of arterial port chamber.

For the regional chemotherapy the port chamber was punctured by special atraumatic needle and connected to injector. The following multi-drug regimen was used: carboplatin 270 mg/m² (or oxaplatin 85 mg/m²) during 60 minutes (1 day), 5- fluorouracil – 295 mg/m² of bolus dosing (1 and 2 days) and 1175 mg/m² for 24 hours (1 and 2 days). 115 mg/m² of leukovorin was administered IV for 60 min (days 1 and 2)

Results. Complications related to angiography and implantation of «port – catheter» system were not observed. 246 cycles of CCAI (from 1 to 29, mean 11) were carried out in 21 patients. During the follow-up period in 10 (48%) out of 21 patients 15 complications were found: hepatic artery thrombosis (n=5), development of inappropriate perfusion (n=4), soft tissues decubitus over the catheter (n=3), catheter dislocation (n=1), port chamber damage (n=1), silicone catheter damage (n=1). Therapy was continued in 13 cases after the elimination of complications and only in 2 cases a transition to systemic chemotherapy regimen was required. The time of PISPC functioning varied from 30 to 832 days (mean, 402).

To date 6 patients have died at 5-21 (mean, 15±2.5) months after the start of CCAI. 15 patients are alive 9-31 months after the start of regional che-

motherapy and continue to receive repeated cycles of CCAI, in 8 of them (53%) neoplastic liver process remains stable. Disease progression, requiring the use of other chemotherapy scheme, was noted in 7 (47%) patients. Total 1-year survival was 95%.

Conclusions: Percutaneous implantation of "port-catheter" system is rather simple, safe and low-traumatic procedure. The use of infusion systems simplifies the realization of repeated cycles of CCAI and improves the quality of life of patients with liver Mts CRC. The complications developing during "port-catheter" system use are not severe and can be successfully corrected by surgical and interventional radiology methods.

MODERN POSSIBILITIES OF HELICAL COMPUTER TOMOGRAPHY OF VESSELS (HCT WITH CORONAROGRAPHY AND ANGIOGRAPHY)

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Invasive coronary angiography (CAG) and angiography (AG) are considered as "gold standard" methods of cardiovascular investigation due to their high information value.

The advent of high-speed multihelical computed tomographs (HCT) made possible noninvasive visualization of arteries of any localization.

Numerous studies aimed at the comparison of HCT CAG and invasive CAG for the diagnostics of hemodynamically significant stenosis (>50%) revealed that modern HCT CAG has a sensitivity of 94%-100%, a specificity of 95% 97%, positive predictive value of 87%-97%, negative predictive value of 99%-100%. These results have confirmed identity of the results received with HCT and CAG in the diagnostics of coronary arterial atherosclerosis and proved the possibility of using HCT instead of invasive studies.

In 2006-2007, 672 HCT CG and 404 HCT AG were performed in the Center of Endosurgery and Lithotripsy. Control coronary angiography performed after that in 47 patients, confirmed coronary lesions; another 136 patients underwent selective angiography..

HCT AG allows to reveal additionally the lesions of other arteries, for example, renal arteries stenoses, as well as other associated diseases: voluminous masses at the adrenal glands, tumors of other organs, and etc. Along with the possibility of evaluating the state of the coronary arteries, HCT CAG allows to study valvular structures (calcifications, developmental anomalies, vegetations), reveals the lesions of the myocardium (scars, aneurysms, hypertrophy, ruptures), heart cavities, pericardium. The additional information can be obtained with the determination of myocardial systolic function revealing dyskinetic areas.

An important feature of HCT CAG is its ability to assess morphological plaque characteristics without using invasive intravascular ultrasound.

Thus, HCT CAG combines in itself the possibilities of several diagnostic methods: invasive coronary angiography, echocardiography and HCT of the heart, and intravascular US.

Unfortunately, there are difficulties with HCT CAG usage for the analysis of coronary involvement in cases of pronounced calcification, small artery diameter, in obese patients and also in the diagnostics of in-stent restenosis inside the stents < 2.5 mm; the study is impossible in subjects with arrhythmia.

Appropriate selection and preparation patients are fundamental to obtain high-quality results, similar to those received with invasive studies.

Current HCT is equal to invasive methods (CAG and AG) in diagnostics of peripheral and coronary arteries involvement, while possessing a number of incontestable advantages such as: noninvasive imaging, absence of necessity for hospitalization, possibility of anatomical and functional evaluation, and speed of visual information obtainment. All these are very convenient for the patient, as well as for the doctor.

«PROVISIONAL-T» STENTING OF BIFURCATIONAL LESIONS IN ACUTE CORONARY SYNDROME

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The effect of percutaneous coronary interventions and the improvement of prognosis in patients with acute coronary syndrome (ACS) with or without ST-elevation are proved by different randomized studies. Though the problem of PTCA in bifurcational lesions, encountered in up to 20% in patients with ACS, remains actual and thrilling. The world experience of treatment of bifurcational coronary lesions is large. Original stenting techniques, such as “crash stenting”, “T” and “Y” stenting, “kissing balloon” angioplasty, as well as special bifurcational stents are developed and introduced in practice. However up to now general problems of treatment of bifurcational coronary stenoses, such as low frequency of success of intervention, high frequency of restenosis and high cost of procedure, remain unsolved. Therewith thrombotic occlusion of the symptom-related artery in many patients with ACS often inhibits the estimation of the distal artery lumen, thus not allowing for advance operation planning. The presence of thrombotic masses in the vessel’s lumen increases the risk of lateral branches involvement due to plaque dislocation and distal embolism. All these factors influence the completeness of revascularization of bifurcational coronary lesions in patients with ACS.

According to the recent studies the best long-term results of stenting of bifurcational coronary lesions are received with «Provisional T» technique –stenting of the main artery with dilatation of lateral branch ostium through the stent struts and final “kissing balloon” dilatation. In most cases this technique uses 1 stent in bifurcational zone.

Study objective: to evaluate the effectiveness and safety of «Provisional T» stenting in the treatment of bifurcational coronary lesions in patients with ACS with and without ST-elevation.

Material and methods: we performed retrospective analysis of 122 patients with ACS with and without ST-elevation who underwent «Provisional-T» stenting for bifurcational coronary lesions from 2005 till June 2007

The indication for bifurcational stenting was >70% stenosis of the main artery with lateral branch origin >2 mm.

Mean age of patients was 52 years; 106 patients (87%) were male. The reference diagnosis was: acute stage of myocardial infarction in 70% (85 patients), instable angina in 20% (24 patients), ACS without ST-elevation in 10% (13 patients). In 28% (34 patients) coronary angiography (CAG) was preceded by thrombolytic therapy with various effects, as estimated by ECG. Four patients were in cardiogenic shock (3.2%) and received ALV.

Selective coronary angiography and left ventriculography were performed by standard technique on Philips Integris CV 5000 with nonionic contrast agent Ultravist 300 or Optiray 300.

Bifurcational lesions were estimated according to «Medina» classification. Most interventions were performed in the LAD+DB (67 patients – 55%), in the CxB+OMB (30 patients – 25%) and in the RCA+PIVB+PLB branches (25 patients – 20%), less commonly – in the RCA+AMB (5 patients – 4%). Occlusion of the symptom-related artery was revealed in 49 patients (40%), subocclusion with critical stenosis (over 95%) in 43 patients (35%), 70-95% stenosis in 30 patients (25%). Angiographical signs of parietal thrombus were found in 89 patients (73%).

Prior to PTCA all patients received loading dose of Clopidogrel (Plavix) 300-600 mg

Endovascular intervention was performed in accordance with standard provisional technique of stenting. “Direct” stenting was done in 49 cases (40%). Protection of lateral branch by “jailed” guide technique was used in 104 cases (82%). Recanalization of lateral branch ostium through the stent struts was performed in 120 cases (98.3%); in 2 patients (1.6%) it was impossible to introduce the guide through the stent struts. Final “kissing balloon” dilatation was performed in 117 patients (96%). «Provisional-T» stenting of “unprotected” LCA was done in 8 patients (6.5%). In one case we performed «reversed provisional-T» stenting for isolated ostial lesion of a large diagonal branch associated with marked “muscular bridge” in the

LAD (type 0.0.1 in Medina classification). Two patients had prolonged lesion of the infarct-related artery with the involvement of two lateral branches, so they underwent double «Provisional-T» stenting.

Results: Optimal angiographic results of stenting of the main coronary artery were obtained in all patients. Absence of residual stenosis or dissection of the artery on CAG were considered the criteria of optimal result. Different degree of lateral branch ostium compromise was revealed in 98%, probably, due to plaque and thrombotic masses dislocation and ostial spasm. In 15% of cases we noted lateral branch occlusion after stenting; in most cases this occurred in lateral branch origin at the side of eccentric plaque, in ostial lateral branch stenosis and in lateral branch arising at an angle $>70^\circ$ from the main artery.

Dilatation of lateral branch ostium through the stent struts was performed in 117 cases (96%); in 2 patients recanalization through the stent struts was not feasible; in 3 patients the balloon could not be inserted into the lateral branch. Good result after «kissing balloon» angioplasty was obtained in 65% (79 patients), satisfactory result (residual stenosis 30-50%) – in 32% (39 patients). Unsatisfactory results («kissing balloon» was not performed) were received in 4% (5 patients).

The postoperative period was eventless in 118 patients (96.7%). Repeated myocardial infarction developed in 2 patients (at days 1 and 3). Both of them underwent repeated procedure. In the first case, after the diagnostics of a subacute stent thrombosis, recanalization and PTCA were performed. In the second, with an unstable plaque distal to the stented segment of the main artery, an additional stent was implanted. There were 2 in-hospital deaths: 1 – left ventricular rupture, hemotamponade (PTCA after TLT, death at day 2 after PTCA); 2 – a female patient with LCA lesion in cardiogenic shock (total mortality – 1.6%).

Control coronary angiography was performed in 27 patients (22%) for clinical indications 1-10 months after the procedure. Angiographically significant restenosis was revealed in 11 patients («clinical» restenosis – 9%), in 5 cases there was in-stent restenosis, 6 patients had restenosis of lateral branch ostium. Progressive atherosclerotic disease in other coronary arteries was seen in the remaining patients.

Conclusions: Frequency of bifurcational coronary lesions in patients with ACS with or without ST-elevation is about 16%. Bifurcational stenting in patients with ACS is associated with high risk of lateral branches compromise. The technique of bifurcational coronary stenting by a single stent («Provisional T» stenting) in patients with ACS is effective and safe.

MULTIVESSEL CORONARY LESIONS IN PATIENTS WITH CHD: DIRECT SURGICAL MYOCARDIAL REVASCULARIZATION OR PTCA?

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Purpose. Comparative evaluation of early and mid-term clinical and angiographic results of direct and endovascular myocardial revascularization in patients with CHD with multivessel coronary lesions.

Material and methods. We have studied the data of 529 patients. From 2001 till 2006, 280 of them underwent 280 operations for direct myocardial revascularization (Group 1), while in 249 during the same period 589 stenting procedures have been performed (Group 2). Main baseline characteristics were not significantly different in both groups. The average number of distal anastomoses was 2.87 ± 0.8 per patient. Only arterial conduits were used in 75 (26.8%), arterial and venous – in 202 (72.1%) and only venous conduits – in 3 patients (1.1%). Average number of stents in Group 2 was 2.4 ± 0.7 per patient. 76 patients (30.5%) received 123 stents with antiproliferative coating. Complete myocardial revascularization was achieved in 171 (61.1%) patients in Group 1 and in 171 (68.6%) in Group 2 ($p > 0.05$). In the mid-term (after 8.1 ± 4.6 months in Group 1 and after 8.6 ± 5.5 months in Group 2) we have examined 185 (66.1%) and 180 (72.3%) patients, respectively.

Results. The incidence of MACE was not significantly different depending on the method of myocardial revascularization. In the early follow-up there was 1 death (0.35%) in Group 1 and 1 death (0.4%) – in group 2, Q-wave MI (including fatal) developed in 2 (0.7%) and 3 (1.2%) patients, respectively ($p > 0.05$). In the mid-term there were no lethal outcomes in Group 1, while 3 patients died in Group 2 (1.7%; all – from heart-related causes), Q-wave MI (including fatal) developed in 3 (1.6%) and 5 (2.8%) patients, respectively ($p > 0.05$).

Clinical picture of CHD recurred in 45 (24%) patients in Group 1 and in 66 (37%) – in Group 2 ($p < 0.05$), repeated myocardial revascularization was performed in 25 (13.5%) and 74 (41.1%), respectively ($p < 0.05$). CABG was performed in 7 cases in Group 1 (3.9%). Repeated myocardial revascularization was associated with unsatisfactory angiographic results of the previous procedures 14 (7.6%) patients in Group 1 and in 52 (28.9%) – in Group 2 ($p < 0.05$). The stenosis in the site of intervention was revealed more commonly in PTCA group, than in surgical group: 32 (6%) and 65 (16%) ($p < 0.05$). The rate of occlusion was not significantly different: 26 (5%) and 14 (3.4%), respectively ($p > 0.05$). Among the factors producing an unfavorable impact on angiographic results of PTCA as compared with CABG we can mention: patient's age > 65 years, diabetes mellitus, low myocardial con-

tractility, as well: stenosis of the left main coronary artery, of proximal LAD segment, B2/C type lesion (AHA/ACC). The incidence of unsatisfactory angiographic results revealed with the use of stents with antiproliferative coating within the subgroups with the above factors was comparable (table).

Groups	Group 1		Group 2 (DES)	
Age ≥ 65 years	142	12 (8.5%)	19	0
Diabetes Mellitus	39	3 (7.7%)	18	2 (11.1%)
LV EF < 50%	59	4 (6.8%)	14	1 (7.1%)
Stenosis of the proximal/3 of the LAD ПМЖБ > 70%	82	3 (3.7%)	21	1 (4.8%)
Lesion of B2/C type	336	35 (10.4%)	42	5 (11.9%)

Significant advantage of PTCA as compared with CABG was received only in the subgroups with baseline coronary arterial stenosis < 70%.

Conclusion. The mid-term effectiveness of the methods of direct and endovascular myocardial revascularization is comparable in most CHD patients with multi-vessel coronary lesions (including in CHD patients with the factors potentially unfavorable from the viewpoint of PTCA – providing the stents with antiproliferative coating are used).

COMPARATIVE ASSESSMENT OF THE RESULTS OF BIFURCATIONAL STENTING AND THE STENTING OF ONLY THE MAIN VESSEL IN BIFURCATIONAL CORONARY STENOSIS

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Purpose. To evaluate the reasonability of the routine use of a second stent (the stenting of the lateral branch) during coronary stenting in the site of bifurcation.

Characteristics of patients. The study comprised the data of 97 patients with CHD with bifurcational coronary lesions, who were divided into two groups. Group 1 included 72 patients in whom only the main vessel was stented, Group 2 – 25 patients in whom both the main and the lateral branches of the bifurcation were stented (in 15 of them (60%) V-stenting was performed and in 10 (40%) – T-stenting). The essential clinical, historical and angiographic data were not significantly different between the groups. The vast majority of patients in both groups had true bifurcational lesions of the LAD (bifurcational lesion type I). The average diameter of the lateral branch was 2.2 ± 0.3 mm in Group 1 and 2.3 ± 0.2 mm in Group 2. Baseline degree of the main artery stenosis varied from 70 to 100% in both groups, of the lateral branch – from 0 to 90%. All endovascular procedures were performed in accordance with the generally adopted technique. Bare stents without antiproliferative coating were used in the vast majority of patients in both groups.

Results. Complete myocardial revascularization was performed in 61 (84.7%) patients in Group 1 and in 21 (84%) – in Group 2. Immediate success of PTCA was achieved in 100% in both groups. After the stenting of the main artery antegrade blood flow in the lateral branch deteriorated in 8% of cases in Group 1 and in 4% – in Group 2; these patients underwent successful balloon PTCA or T-stenting through the stent struts. Immediately after the procedure the diameter of the lateral branch at the site of intervention was significantly bigger in Group 2, than in Group 1. No cases of lateral branch occlusion, acute vascular thrombosis were noted in any of the groups.

Control CAG was performed in the mid-term in 65 (90.3%) patients in Group 1 and in 20 (80%) patients in Group 2. The incidence of the main vessel restenosis was 24 (36.9%) and 9 (45%), of occlusion (including the cases of thrombosis) – 1 (1.5%) and 2 (10%), respectively. Lateral branch lumen was preserved (antegrade blood flow TIMI 3) in 62 (95.4%) cases in Group 1 and in 18 (90%) – in Group 2, with this the diameter of lumen in both groups was not significantly different. The incidence of lateral branch restenosis after PTCA (Group 1) was 60% (9 of 15 cases), after stenting (Group 2) – 45% (9 of 20 cases). The incidence of lateral branch occlusion was 0% and 5% (1 of 20 cases), respectively. No cases of in-stent thrombosis were seen in Group 1, in Group 2 thrombosis developed in 1 (5%) patient within the first 30 days and in 1 (5%) – later after stenting.

Survival during the follow-up was 100% in both groups. No cases of MI or angina recurrence were noted in the early follow-up. In the mid-term MI developed in 2 (10%) patients in Group 2 (Q-wave MI – in 1 of them (5%)). Clinical picture of angina was observed in 27 (41.5%) patients in Group 1 and in 10 (50%) – in Group 2; in the vast majority of them control CAG revealed restenosis in both bifurcation branches. Repeated myocardial revascularization was performed in 27 (41.5%) cases in Group 1 and in 11 (55%) – in Group 2; among them the interventions in the lateral branch was performed in 6 (9.2%) and 7 (35%) patients, respectively.

Conclusion. Thus, routine use of the second stent for lateral branch stenting in CHD patients with bifurcational lesion of the coronary arteries did not reveal advantages as compared with the stenting of only the main vessel, from the viewpoint of angiographic, as well as of clinical results. Besides, with routine use of the second stent the incidence of restenosis of the main vessel was significantly higher, and there was a tendency for the increase of in-stent thrombosis and MI incidence.

COMPARATIVE EVALUATION OF THE RESULTS OF ENDOVASCULAR PROCEDURES IN AMI PATIENTS WITH AND WITHOUT PRE-HOSPITAL THROMBOLYSIS

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Purpose of study. To perform comparative analysis of clinical and angiographic results of PTCA in patients with AMI after effective pre-hospital TLT and without TLT with IRA occlusion.

Characteristics of patients. We have studied the results of examination and treatment of 218 patients with acute Q-wave anterior myocardial infarction. The exclusion criteria were: history of anterior myocardial infarction, occlusion of the Cx_B and/or LAD revealed on CAG. At pre-hospital stage 108 out of 218 patients had systemic TLT (in the vast majority of cases (74.1%) with Streptase solution), in the remaining 110 cases TLT was not performed. Within the first 6 hours after the onset of anginal attack all 218 underwent CAG and therapeutic endovascular procedure in the syndrome-related coronary artery – the LAD of the LCA. According to CAG data, the effectiveness of TLT (antegrade blood flow TIMI 2-3 in the LAD) was 58.3% (63 patients), the incidence of spontaneous IRA recanalization – 31.8% (35 patients).

This study comprised 138 out of 218 patients. Group I included 63 patients with effective pre-hospital TLT (antegrade blood flow TIMI 2-3 in the LAD), Group 2 – 75 patients without pre-hospital TLT and with closed IRA (as judged by CAG, antegrade blood flow TIMI 0-1 in the LAD). The essential clinical and historical data were not significantly different between the groups. The time from the onset of the anginal attack until the admission was 3.8 ± 1.6 hours in Group I and 3.5 ± 1.6 hours in Group II. The “Door-Balloon” time in both groups did not exceed 30 minutes. According to CAG data, most patients had lesions in the proximal segment of the LAD. The patients from the TLT group underwent 32 PTCA procedures and 30 stentings of the IRA; in the group without TLT – 30a and 45 procedures, respectively. All PTCAs were carried out in accordance with generally adopted technique.

Results. PTCA was feasible in all patients from both groups. Optimal immediate result of PTCA (residual stenosis <30%, absence of dissection and embolization signs, antegrade blood flow TIMI-3) was achieved in 67% in Group I and in 64% in Group II. Suboptimal result of PTCA (slow reflow in the IRA) was seen in 25.4% of cases in Group I and in 30.7% in Group II; «no reflow» syndrome – in 1.6% and 1.3% of cases, respectively. The signs of IRA embolism after PTCA were revealed in 11.1% of cases in Group I and in 16% Group II, no signs of severe dissection were found in both groups. Acute IRA thrombosis after PTCA was seen in 3 (4.7%) cases in Group I and in 1 (1.3%) case in Group II. In all 4 cases of IRA thrombosis successful repeated PTCA was carried out.

Hospital mortality (cardiac in all cases) was: 3.2% (2 patients) in Group I and 1.3% (1 patient) – in Group II. Recurrent MI developed only in 2 patients (3.2%) in Group I. Bleeding, requiring emergency surgical intervention, occurred only in Group I – also in 2 (3.2%) patients. No cases of acute cerebral blood flow disturbances were noted.

After PTCA a decrease of ST by over 50% as compared with the baseline ECG was seen in 33.3% of cases in Group I and in 54.6% in Group II, the absence of ST dynamics – in 17.5% and 21.3%; ST elevation – in 17.5% and 2.7% of cases, respectively.

In the mid-term (after 7.1 ± 2.7 months) we have studied 23 patients from Group I and 27 patients from Group II. Survival was 100% in both groups. No cases of recurrent were noted in Group I, in Group II recurrent MI developed in 1 patient (4.3%). Resumption of anginal symptoms was noted in 6 (26.1%) patients in Group I and in 6 (22%) – in Group II.

According to control CAG, the incidence of restenosis was higher in Group II (with initially closed IRA). Restenosis >75% was seen in 21.7% in Group I and in 37% in Group II ($p < 0.05$); no cases of reocclusions were encountered in Group I, in Group II reocclusion was revealed in 2 (7.4%) cases.

The table shows the dynamics of EDV, ESV and global EF in both groups during the follow-up.

Groups	Group I (n=23)		Group II (n=27)	
	Early	Mid-term	Early	Mid-term.
EDV, ml.	165+47	174+57	175+40	187+44
ESV, ml.	94+35	81+43	94+29	94+34
EF, %	44+10	55+11	46+11	50+13

Comparative analysis of segmental LV contractility revealed significant differences in lateral and apical segments' EF between the groups.

Conclusion. Our data suggest, that the incidence of early myocardial reperfusion in the IRA territory in patients with AMI after pre-hospital TLT is by 26% higher, than in patients without TLT. For example, the IRA could be opened in 29 out of 110 our patients without TLT, if the emergency team had administered a thrombolytic agent.

The frequency of clinical and angiographic complications in the groups of study was not significantly different in early, as well as in the mid-term follow-up. However in the group with effective TLT, in comparison with the control group (without TLT with initially closed IRA), we have noted a tendency for the increase of the rate of acute IRA thrombosis, myocardial re-infarction and bleedings early after PTCA. Significant decrease of ST segment after PTCA in this group also was significantly less common than in the control group: in every third patient after TLT and in every second without TLT.

During the follow-up global LVEF increased in most patients, mainly at the expense of the myocardial segments in the territory of the IRA. However the increase of global LVEF in Group I (with effective TLT) was significantly higher than in the control group (without TLT with initially closed IRA): on the average, by 7%. At the same time, a tendency for the increase of LVEDV was seen in most patients in both groups; it was probably related to the processes of postinfarction remodeling of the myocardium.

LIMITATION OF REPERFUSION DAMAGE OF THE MYOCARDIUM IN ACUTE PERIOD OF MYOCARDIAL INFARCTION WITH INTRACORONARY ADMINISTRATION OF METABOLIC CYTOPROTECTORS

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Purpose: to study cardioprotective effect of metabolic cytoprotectors Neoton (phosphocreatine) and Mexicor (methylethylpyridinol succinate) administered intracoronary in the infarct-related artery (IRA) after its recanalization within the first hours after the onset of acute transmural myocardial infarction (AMI).

Material and methods. The study comprised 147 patients (mean age 56 ± 7 years) with acute occlusion of proximal or middle segment of the LAD and absent the antegrade blood flow (TIMI 0), who underwent successful recanalization of IRA within the first 6 hours after the onset of AMI. Prior to angiography all patients were randomized into 3 groups. The Group 1 patients ($n=43$) received 2 g of Neoton directly during the procedure of IRA recanalization; the Group 2 patients ($n=47$) received intracoronary infusion of 0.2 g of Mexicor. Group 3, which served as control, comprised 57 patients with AMI who underwent successful recanalization of IRA without intracoronary infusion of cytoprotectors. Baseline clinical, history and angiographic data were not statistically different between the groups. Intracoronary administration of the above agents was performed for 10 minutes, together with myocardial reperfusion. Blood sampling for markers of cardiomyocytes injury (Troponine I, myoglobin) was performed during IRA recanalization, at 12 and 24 hours after the procedure. At day 10 after the onset of the disease all patients underwent control ventriculography, and also they were recommended to have a control in-hospital examination after 6 months.

Results. In-hospital course of the disease was relatively uneventful, there was 1 (1.7%) death in Group 3. Mean values of Troponine I concentration 12 hours after the procedure in Groups 1 and 2 were 296 ± 41 and 536 ± 34 mg/ml, respectively, that is, reliably lower than in Group 3 (872 ± 51 ng/ml). In the long-term follow-up after the procedure, on the average after 6.8 ± 0.7 months, the survival in Group 1 was 97.9%, in Group 2 – 95.7%, in Group 3 – 92.9% (the inter-group differences were insignificant; $p > 0.05$). LVEF in Groups 1 and 2 was $51.4 \pm 11.7\%$ and $47.1 \pm 9.2\%$, respectively, that is, significantly higher than in control group $41.8 \pm 8.3\%$ ($p < 0.05$). The dynamics of the contractility of infarct-related segments of the LV was significantly better in these two groups as compared with the control group (table 1).

Conclusion. Our study suggests that intracoronary administration of metabolic cytoprotectors Neoton and Mexicor limits reperfusion injury of the myocar-

dium and contributes to the preservation of structural and functional integrity of cardiomyocytes after antegrade blood flow restoration in the infarct-related artery within the first hours after the onset of AMI.

Table1. Segmental contractility of the left ventricle as judged by ventriculography, %

	Segments:	Group 1	Group 2	Group 3
Baseline	Antero-basal	50.1 ± 16.4	48.3 ± 16.4	45.9 ± 20.2
	Antero-lateral	0.9 ± 22.1	1.2 ± 22.1	-2.8 ± 20.4
	Apical	0.7 ± 7.9	-2.4 ± 6.4	1.4 ± 8.6
	Diaphragmatic	48.4 ± 25.2	46.3 ± 23.0	50.2 ± 22.5
	Postero-basal	40.5 ± 17.1	44.7 ± 14.3	43.6 ± 10.8
Long-term follow-up	Antero-basal	53.1 ± 11.8	55.7 ± 27.1	48.8 ± 19.9
	Antero-lateral	$20.4 \pm 21.7^*$	$21.4 \pm 28.5^*$	11.5 ± 17.6
	Apical	$17.8 \pm 13.2^*$	$12.1 \pm 9.3^*$	5.2 ± 10.4
	Diaphragmatic	35.9 ± 21.8	40.8 ± 22.7	38.2 ± 18.7
	Postero-basal	39.3 ± 11.6	$45.1 \pm 7.7^*$	34.0 ± 12.8

*-the differences in the groups of study in comparison with the control group are significant, $p < 0.05$

RESULTS OF INTERNAL CAROTID ARTERIES STENTING

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During the period since 2003 till 2006, 172 internal carotid artery stenting in 157 patients were performed.

There were 81% of male and 19% of female patients, with mean age 67 ± 14 years, with symptomatic (in 92% of cases) 50-99% stenosis of the internal carotid arteries. The majority of patients had some associated pathology: CHD – 73%, general atherosclerosis – 31%, diabetes mellitus – 20%, arterial hypertension – 94%. Stenosis of other internal carotid arteries was present in 8 (4.7%).

The devices protecting from cerebral embolism were used in all patients. These were three models of distal filters from different manufacturers. Cylindrical and conical stents were used in carotid arteries.

Technical success of intervention was obtained in 99.4%. Hospital mortality was 0.6%. Complications were seen in 6 (3.5%) cases: the "big" stroke (2.3%) and the "small" stroke (1.2%). Transitory cerebral ischemia was observed in 7.6% of cases.

Long-term results (from 6 months till 3 years) were evaluated in 73 patients. None of them died or had stroke. Restenosis was seen in 3 patients (4.1%), they underwent repeated stenting.

Conclusions: Stenting for symptomatic internal carotid artery stenosis is an effective and safe method of surgical prevention of ischemic stroke.

ENDOVASCULAR INTERVENTIONS IN PATIENTS WITH OCCLUSIVE-STENOTIC LESIONS OF THE TERMINAL AORTA

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Retro-and prospective analysis of endovascular interventions in patients with occlusive-stenotic lesions of the terminal aorta was carried out. In 2004-2007, 42 patients underwent 46 endovascular interventions on terminal aorta with bifurcational stenting. The most frequent anatomic zones of lesions were:

- terminal aorta and proximal segments of the common iliac arteries;
- terminal aorta and proximal third of one iliac artery;
- proximal parts of the common iliac arteries.

In most cases (39 patients) bilateral puncture approach was used, in 4 patients – puncture approach with contralateral femoral arteriotomy was applied.

Immediate success of the procedures was achieved 97.5% (in 1 case recanalization of an occluded segment of a common iliac artery was impossible).

Surgical mortality, myocardial infarctions, acute strokes and acute thromboses of the stents weren't observed. Emergency operation was performed in 1 patient.

Long-term results (after 6 months) were followed in 27 patients. Primary permeability of the operated segments was 95%, secondary permeability – 100%. Subacute stent thrombosis developed in 1 patient (thrombectomy was performed). Subcutaneous hematoma of the puncture site was seen in 4 cases (conservative therapy). In-stent restenosis that required repeated endovascular interventions developed in 2 patients (one of them underwent repeated angioplasty, another – repeated stenting).

Conclusions: endovascular methods are effective and safe for the treatment of occlusive-stenotic lesions of terminal aorta.

INFLUENCE OF THE RESULTS OF INTRAVASCULAR MANOMETRY ON THE TACTICS OF ENDOVASCULAR INTERVENTIONS IN BIFURCATIONAL CORONARY LESIONS

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Study objectives: estimation of the diagnostic value of intravascular manometry in the choice of the tactics of endovascular interventions in bifurcational coronary lesions.

Material and methods. Entry criteria were:

- stable exertional angina which functional class

was estimated in accordance with the CCS classification;

- bifurcational lesion of the LAD;
- primary (not restenotic) character of coronary lesions;
- lateral branch diameter ≥ 2 mm, extent of lesion in the lateral branch < 10 mm;
- after stenting of the main branch – angiographical characteristics of the lateral branch: ostial compromise, TIMI 3 blood flow;
- fractional reserve of blood flow in the lateral branch > 0.75 , as judged by intravascular manometry;
- use of drug-eluting stents.

Exception criteria were lesion of the left main coronary artery, acute coronary syndrome, previous CABG, left ventricular dysfunction (ejection fraction $< 40\%$).

17 patients with bifurcational LAD stenosis were examined in the 3rd Central Military Clinical Hospital of A.A. Vishnevsky. Group 1 comprised 9 patients, who underwent bifurcational LAD stenting with one or two stents implantation. Group 2 comprised 8 patients in whom only the main branch was stented.

After the stenting of the main branch all patients had Intravascular manometry of lateral branch performed through the stent cell. Fractional reserve of blood flow in lateral branch was insignificant in all cases. The results were estimated during the procedure, during in-hospital stay and at 6 months, on the base of presence or absence of major cardiac events.

Results. In-hospital clinical effectiveness was 100% in both groups. In the long-term (6 months), recurrent angina was found in 2 patients in Group 1 and in 1 patient in Group 2. In all these cases recurrent angina was related to severe in-stent restenosis in the stented segments of arterial bifurcations.

Conclusions. Bifurcational stenting is not necessary in cases with small blood flow fractional reserve (more than 0.75) in the lateral branch. The use of intravascular manometry in cases with bifurcational coronary lesions allows for accurate determination of indications for the extension of the intervention volume, thus giving chance to avoid unjustified intra-operative complications

EFFECT OF OIL EMBOLIZATION OF HEPATIC ARTERIES IN BILOBED MALIGNANT LESIONS OF LIVER

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Treatment of malignant liver tumors is a thrilling problem of clinical oncology. According to WHO data, hepatocellular carcinoma enters in top-ten of most widespread tumors in the world. In Russia hepatocellular carcinoma makes 1.5 – 2.2% of all malignant neoplasms.

Liver metastases are observed in 20-70% of oncological patients. The best treatment modalities are resection and liver transplantation. However radical tumor resection is feasible in only 5-15% of patients. Other cases are amenable to palliative treatment.

Along with widely used methods of local influence on tumor, such as cryoablation, radiofrequency, laser and chemical ablation, methods of intervention radiology have developed.

Study objectives: estimation of effect of oil embolization of hepatic arteries (OEHA) in complex treatment of liver tumors.

Material and methods: OEHA was performed in 89 patients with liver tumors. Mean age of 64 men and 25 women was 60 ± 1.5 years. Hepatocellular carcinoma was present in 9 patients. Primary tumor in the cases with metastatic dissemination was colon cancer in 73 patients, breast cancer in 3 patients, and stomach cancer in 4 patients. Resection of primary tumor was performed in all patients in the period ranging from 1 month to 4 years. Recurrence of tumor in the preserved part of liver after anatomic resections was seen in 18 patients. Cryoablation of big tumor nodes with further OEAH in adjuvant regimen was used in 7 patients. OEAH with percutaneous injection of 96% of ethanol was made in 7 patients.

Results: The effect of therapy was estimated one month after first OEAH and then before each new course of regional chemotherapy. Clinical investigation, CBC and biochemical blood examination, US, CT and MRI with bolus enhancement (Omnipac, Omniscan) were performed. Also the levels of tumor markers (CEA, CA19-9, HAFP, CA 153) were estimated. In the cases of liver metastases the topical tumor recurrence was excluded: the patients with colon cancer underwent fiberoptic colonoscopy; the patients with breast cancer – radionuclide bone marrow imaging, chest CT.

53 patients were re-examined. Complete response (tumour regression) was obtained in 2 (3.5%) patients with breast cancer metastases after 2 courses of OEAH with Dokсорubicin in one case and Taksoter in the second. Partial response to the treatment (reduction of tumor by more than 50% of its size) was seen in 14 (26%) patients; stabilization (less expressed reduction or absence of neoplasm growth) was seen in 32 (59%) patients; 5 (9%) patients had signs of tumor growth. In patients with full or partial response significant decrease of tumor markers (CEA) and improvement of life quality were found. Complications (abscess of right hepatic lobe, obstructive jaundice) were observed in 2 patients and led to fatal outcome in 1 case.

The survival rate was 91% and 85% at 6 months and 1 year, respectively.

Anatomic liver resection after regional chemotherapy was performed in 4 patients (8.6%).

Conclusions: complex evaluation of the results of treatment in patients with primary liver tumor not amenable or partially amenable to surgical resec-

tion, as well as in patients with malignant metastases of various localization, allows to improve the outcome and to optimize the treatment.

PRIMARY PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY AND STENTING IN PATIENTS WITH CHD

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Study objectives: to improve the results of treatment in patients with chronic heart disease (CHD), old myocardial infarction (MI) by percutaneous transluminal balloon angioplasty (PTCA) and coronary stenting.

Material and methods: PTCA and coronary stenting were performed in 103 patients with CHD during 1992-2004. There were 98 male, and 5 female patients. Mean age was 51 year. Angina of the I functional class (FC) was observed in 22 patients (3 patients had 2 old myocardial infarctions; 19 – old MI); 25 were in FC II (24 patients with 1 old MI, 1 with 2 old MI); 47 – in FC III (11 patients with 2 old MI, 36 with 1 old MI); 9 patients – in FC IV (8 with 1 old MI, 1 patients with 2 old MI).

Seventeen lesions in various segments of coronary arteries were found in patients under 40 years (11 patients), 78 lesions – in patients aged 40– 49 years (37 cases), 69 lesions – in patients aged 50 – 59 years (32 cases) – 69 cases, and 69 lesions – in patients over 60 years (23 patients).

PTCA was performed in 106 cases, in 6 out of them recanalization was attempted. Repeated PTCA was performed in 5 patients, in one case three procedures were carried out.

PTCA with stenting was done in 54 patients, from them in 5 cases direct stenting was performed (mean diameter of stent was 3.20 and length 16 mm); coronary stenting using 2 stents was performed in 7 patients, and in 1 case 6 stents were used.

Complications after PTCA and stenting occurred in 4 patients (non-Q-wave MI – 1, Q-wave MI – 3).

Life quality improvement and reduction of angina FC were noticed in 75% of patients with old MI who underwent primary PTCA with coronary stenting.

Conclusions: primary PTCA and coronary stenting are effective methods of treatment for the patients with old MI.

APPLICATION OF DEVICES FOR THE CLOSURE OF FEMORAL PUNCTURE SITE AFTER ENDOVASCULAR INTERVENTIONS

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During almost two years of application of suturing devices Perclose A-T, and then Perclose ProGlide

Character of complications	Successful closing procedure			Failure with device usage			Total	Manual compression*
	Perclose	On-Site	Starclose	Perclose	On-Site	Starclose		
N	216	62	48	21 (8.9%)	5 (7.5%)	4 (7.7%)	356	350
Delayed bleeding	11 (4.6%)	3 (4.5%)	0	0	0	0	14 (3.9%)	10 (2.9%)
Infection	1 (0.4%)	1 (1.5%)	0	0	0	0	2 (0.6%)	2 (0.6%)
Subsequent surgical operation	1 (0.6%)	1 (2.3%)	0	0	0	0	2 (0.6%)	4 (1.1%)
Hematoma	20 (8.4%)	8 (11.2%)	2 (7.7%)	17	2	4	53 (14.9%)	42 (12.0%)

* – Comparison group (retrospective analysis)

(Abbott Vascular Devices), clipping device Starclose (Abbott Vascular Devices) and devices on the basis of collagenous sponge On-Site (Datascope) in 356 patients in 3rd Central Military Clinical Hospital of A.V. Vishnevsky, the success was achieved in 326 (92.6%) cases, while 30 (8.4%) cases failed. Technical problems with the usage of Perclose device were observed in 21 (8.9%) cases, with On-Site devices – in 5 cases (7.5%) and with Starclose device – in 4 cases (7.7%). In most cases the reason of failure was related to insufficient operator's experience at the stage of new technique mastering.

The character and the frequency of all failures and complications are presented in the table.

Conclusions. Application of special devices for puncture sites closure after endovascular interventions through femoral approach provides fast hemostasis and early activation of the patient, thus allowing for the reduction of hospital stay and the improvement of the quality of life; however the amount of complications is comparable with manual compression.

UTERINE ARTERY EMBOLIZATION (UAE) IN THE TREATMENT OF UTERINE MYOMA: MYTHS AND REALITY

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Introduction: In spite of the fact that UAE has been used for the treatment of hysteromyoma in our country for more than 5 years and more than 10 years abroad, there is a number of misinterpretation of the methods – so-called “myths” of UAE – among specialists, mainly among gynecologists. First of all it concerns the questions of UAE application in submucous myomas, in large uterine myoma, and in patients interested in pregnancy. Besides, the tendency of exaggerating the risk of ovarian function impairment following UAE.

Material and methods: over a period from 2002 to 2007, 1420 patients with hysteromyoma underwent UAE. Fifty nine percent of patients had

submucous myomatous nodes; in 6% of patients, size of the uterus corresponded to more than 18 weeks of pregnancy (giant myoma), and 53% of patients had various types of utero-ovarian anastomoses. Besides, 20.4% of patients were interested in pregnancy, and in 90% out of them the UAE was the only option of organ-preserving treatment.

Results: Patients with type 0 submucous nodes were noted to have myolysis in 18% of cases, expulsion of myoma – in 82%. In node types 1 and 2, the expulsion was observed in 9% and 13%, respectively. With the correct gynecologic assistance, the expulsion proceeded without pyometra and hemorrhage and resulted in restoration of uterine architecture. In 23% of cases the changes in myomatous nodes topography took place in patients with node, types 1 and 2, which allowed for hysteroscopy.

In patients with giant myoma, the UAE was supplemented with myomectomy in 34% of cases. A greater intensity and duration of postembolization syndrome was noted in this group.

The use of particular techniques and modification of the methods allowed minimizing the risk of unintended embolization of ovarian arteries in patients with utero-ovarian arterial anastomoses. In 26 cases of type 3 anastomosis, the selective embolization of branches of the ovarian arteries with microcatheters was applied. In those cases there were no signs of persistent amenorrhea after UAE.

In 26 patients out of those who were interested in child-bearing, pregnancy occurred within 6-20 months after UAE that resulted in delivery in 14 patients, in miscarriage – in 2 patients, and in abortion – in 2 patients; 8 patients are still pregnant at different gestational age.

Conclusion: The uterine artery embolization can be successfully used in patients with giant and submucous myomas. Application of techniques minimizes the risk of unintended embolization of ovarian arteries in case of utero-ovarian arterial anastomoses. In patients who are interested in pregnancy, the UAE may be used as organ-preserving treatment method, especially in case of contraindications for myomectomy.

PORTACAVAL SHUNTS – CLASSIFICATION AND RELEVANCE FOR THE EFFICACY OF ENDOVASCULAR INTERVENTIONS IN PORTAL HYPERTENSION

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Objective: Assessment of the role and relevance of spontaneous portacaval shunts in choice of the method of endovascular prevention and treatment of portal hypertension syndrome (PHS).

Materials: Over a period from 1981 to 2007 endovascular examination and treatment were performed in 142 patients with PHS complicated by gastrointestinal bleeding (GIB). There were 113 (79.6%) men and 29 (20.4%) women from 18 to 84 (on the average 58.1) years of age. The state on admission of 110 (77.5%) patients was considered as mild or severe.

The transhepatic embolization of the gastric and esophageal veins (TEGaEV), transjugular intrahepatic portasystemic shunting (TIPS) and the reduction of splenic blood flow were the main methods of endovascular treatment of PHS.

Fifty two (36.6%) patients were discovered to have various types of venous portacaval or systemic portacaval shunts that influenced the efficacy of endovascular interventions in PHS.

Results: With the use of TEGaEV alone, the recurrence of GIB developed in 15.4% of patients (62.5% out of them developed recurrence during 6 months and 87.5% – during 4 years). The main cause of the recurrence was the development of various types of portaportal or portacaval venous shunts associated with the postembolization increase of portal hypertension (up to 400-700 millimeters of water) which lead to recanalization of the distal portions of previously embolized gastric and esophageal veins. In 20% of GIB recurrence following embolization of the gastric and esophageal veins, the postoperative thrombosis of the portal vein was the triggering factor of increase of portal hypertension.

The GIB recurrence in 2 patients after the TEGaEV was due to the worsening of portal hypertension and redistribution of the blood flow mainly into rectal portacaval shunts.

The clinical results with the use of TIPS as the option of endovascular treatment and prevention of GIB in PHS appeared much better. Firstly, the endovascular intervention was in all cases accompanied by critical reduction of portal hypertension up to 37.4% from baseline within 2-26 days (15.7 days in average). Secondly, no patients developed thrombosis of the portal vein system and pathologic portasystemic shunts resulting in blood shunt to the esophageal, gastric or rectal veins, following TIPS. Thirdly, the intervention was generally associated with simultaneous TEGaEV which in whole provided both urgent GIB hemostasis and immediate decrease of portal hypertension. And, finally, fourthly, recently we necessarily included interven-

tions on the arterial vessels (reduction of splenic blood flow) into the algorithm of endovascular treatment of PHS which considerably reduced portal hypertension.

Conclusions: We believe that the efficacy of endovascular treatment of portal hypertension syndrome and its complications depends considerably on adequate choice of sequence and appropriateness of interventions on the venous and arterial vessels, which altogether contribute to critical decrease of blood pressure in portal system and interruption of pathologic circulation through portacaval venous shunts.

TACTICS OF ENDOVASCULAR EXAMINATION AND TREATMENT IN PATIENTS WITH MASSIVE PULMONARY EMBOLISM

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Over a period from 2004 to 2007, 510 patients with massive pulmonary embolism (PE) underwent examination and treatment in the clinic of faculty surgery of the Russian State Medical University. There were 414 (81.2%) men and 96 (18.8%) women from 22 to 77 (in average 47.3) years of age. The state on admission of the majority [354 (69.4%)] of patients was considered as severe or extremely severe.

The verification of PE diagnosis was primarily based on endovascular examination which allowed to determine the localization of pulmonary arterial lesion and the severity of lung perfusion impairment. With a mean total Miller index (MI) score of 26.3 points, in 37 (7.2%) cases the thromboemboli were located in the pulmonary arterial trunk, in 389 (76.3%) cases – in the right and/or left pulmonary arteries (PA), and in 84 (16.5%) – in its lobar or segmental branches.

Ultrasound screening of the inferior vena cava (IVC) system enabled us to reveal the “floating” thrombi of different extent to be the cause of PE in 377 (73.9%) patients including the thrombi which were located in the inferior vena cava (8.2%), the iliac (53.9%), femoral or tibial (11.8%) veins.

Taking into consideration the existing contraindications, 421 (82.5%) patients underwent systemic or regional thrombolytic therapy (TLT) as urgent treatment measure. In 7 out of them it was performed via infusion catheter which was placed directly into the thrombotic mass in the pulmonary arteries, and in 5 of them – after the preliminary rotor desobstruction of pulmonary arteries (RDPA) using Schmitz-Rhode catheter. In case of the impossibility of TLT for massive PE, RDPA was performed in 29 patients and rheolytic thrombectomy (RTE) from the pulmonary artery – in 3 patients.

The endovascular prevention of massive PE was done in most (91.2%) cases including endovascular catheter thrombectomy (ECT), implantation of various antiembolic cava-filters (“Sand-glass”,

"Fir Tree", "Umbrella", "Crown", "OptEase" modifications) or stent-filters ("FIST" modification). In the rest cases the alternative methods of surgical PE prevention were used (IVC plication, ligation of the superficial femoral vein, thrombectomy from the iliac or femoral veins).

In urgent treatment of massive PE we were guided by the need for:

- 1) primary intervention on the main pathologic object responsible for the severity of patient's state;
- 2) prevention of potential complications of endovascular examination and treatment while planning the thrombolytic therapy as basic treatment method.

Tactics and methods of endovascular examination in patients with massive PE, which was earlier adopted in our clinic, has principally changed during the last 3 years. In most cases [454 (89%)] we refused to perform central (subclavian, jugular) venous access, catheterization of pulmonary arteries, measuring blood pressure in the right parts of the heart and injecting contrast agent directly into the pulmonary trunk or pulmonary arteries during pulmonary angiography.

Moreover, indications for urgent endovascular PE prevention by means of endovascular catheter thrombectomy (ECT), implantation of antiembolic intravenous cava-filters (ICF) or stent-filters (ISF) were strongly limited regardless of the presence of apparent sources of massive PE such as floating thrombi in the system of the inferior vena cava even extending on its infrarenal part.

The first reasons for this were frequent complications of endovascular interventions via central veins prior to the thrombolytic therapy observed until 2004: haematoma at the puncture site – 43.2%, thrombosis of the access vein – 0.7%, unintentional puncture of the main arteries – 3%, pneumothorax – 2.5%, hemothorax – 0.3%, bleeding at the puncture site – 6.5%.

The second explanation of rejecting the aggressive and extensive endovascular examination of the pulmonary arterial tree in massive PE was the risk of unintentional fragmentation and distal migration of the thrombus located in the pulmonary trunk, as well as reflectory rhythm disturbance during catheterization of the right parts of the heart leading to aggravation of pulmonary embolism and critical deterioration of patients' condition.

Thirdly, we cast doubt on the necessity of urgent endovascular prevention of PE since no patients with massive PE had recurrent pulmonary embolism during the TLT, even in the presence of embolism-dangerous thrombosis of the inferior vena cava system. Moreover, endovascular PE prevention, and particularly ICF or ISF, generally require central vein puncture, and ECT requires jugular venesection, which determine an increased risk of thrombolytic therapy or the impossibility to conduct this therapy.

Based on the acquired experience with endovascular examination, prevention and treatment of patients with massive PE and embolism-dangerous thromboses of the inferior vena cava system, we developed an optimal algorithm for their application, which allows minimizing the complications risk, itemizing indications and contraindications and substantially increasing their efficacy.

ENDOVASCULAR TECHNIQUES IN TREATMENT OF PAGET SCHROETTER'S SYNDROME

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Objectives: To evaluate the efficacy of various endovascular interventions and to develop an optimal algorithm for their application in the treatment of patients with Paget Schroetter's syndrome.

Material and methods: Over a period from 1992 to 2007 102 patients with acute thrombosis of the veins of upper extremities (Paget-Schroetter's syndrome) underwent examination and treatment in the clinic of faculty surgery of the Russian State Medical University. There were 45 (44.1%) women and 57 (55.9%) men from 16 to 76 (on the average 41.5) years of age. In 81 (79.4%) patients endovascular interventions were used for desobstruction of magistral veins: regional thrombolytic therapy (RTLТ) – in 75 cases and Angiojet rheolytic thrombectomy (RTE) – in 6 cases. In 19 (23.5%) out of them the endovascular intervention was accomplished with balloon dilation (EBD) and/or subclavian vein stenting (ES).

Results: Depending on the extent of thrombotic lesion of the subclavian, axillary and brachial veins, the duration of the disease and intensity of collateral circulation, the RTLТ resulted in complete restoration of patency of the veins of the upper extremities in 54.1% of patients, and in partial restoration – in 37.7% of patients. In 8.2% of cases there was no success of regional thrombolytic therapy. The disadvantages of RTLТ were quite frequent complications like phlebitis (13.1%) and local hematomas (6.6%).

Application of endovascular RTE (using XPD catheters of 6 Fr in diameter and 60 cm in length), with absolute efficacy of 80% and partial efficacy of 20% contributed to substantial improvement of RTLТ results in treatment of Paget-Schroetter's syndrome. No complications of RTE were noticed; however, endovascular intervention was generally associated with short-term transient hypotension and bradycardia. In 2 cases minor hematuria was observed within first 24 hours after RTE.

EBD of residual stenosis of the subclavian veins after the RTLТ and RTE was the priority choice for final step of endovascular treatment of Paget-Schroetter's syndrome. Indications for stenting of the subclavian veins were limited to only failures of balloon angioplasty and lack of opportunity for alternative surgical correction of vascular pathological changes.

Conclusions: Endovascular interventions on the magistral veins of the upper extremities are proved to be highly effective method of treating Paget-Schroetter's disease. An optimal algorithm of their application must include consecutive use of rheolytic thrombectomy, regional thrombolytic therapy, balloon dilation, and in single cases – implantation of intravenous stents.

TRANSLUMINAL BALLOON ANGIOPLASTY (TLBAP) IN PATIENTS WITH DIABETES MELLITUS (DM) AND CRITICAL ISCHEMIA OF LOWER EXTREMITIES (CILE)

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Study objectives: to analyze short-term results of endovascular treatment of CILE in patients with DM.

Material and methods: 31 TLBAPs were performed in 30 patients with DM and CILE during 11.2004 till 11.2007. There were 10 men and 20 women of them. The age of patients varied from 45 till 84 years. Mean age of male was 68.3 ± 6.6 years, female – 67.4 ± 9.9 years. 20 (66.6%) patients had ischemic foot ulcer, 5 (16.7%) – gangrene, 5 (16.7%) – ischemic rest pain. Insulin-dependent DM was in 20 (66.6%) patients, 6 (20%) – with tableted preparations intake, in 2 (6.7%) – diet-compensated diabetes. CHD was present in 25 (83.3%) patients, arterial hypertension – 24 (80%), cerebral atherosclerosis – 14 (46.7%), renal failure – 8 (26.7%) (3 (10%) – on chronic hemodialysis), chronic chest diseases – 1 (3.3%) the patient. Distribution on levels and lesions types (TASC): iliac – type 1 (3.3%)A, femoropopliteal – 1 (3.5%) A, 5 (17.2%)B, 12 (41.4%)C, 11 (37.9%)D, calf arteries – 1 (4%)C, 24 (96%)D. The following vascular approaches were used: femoral antegrade in 26 (86.7%) cases, femoral retrograde contralateral – in 3 (10%) cases, popliteal in 1 (3.3%) case, in 2 (6.7%) cases additional pedal approach through dorsal artery of foot was used. Intervention was performed in femoropopliteal segment 27 (90%) cases, in tibioperoneal segment – in 9 (30%), in anterior tibial artery – in 21 (70%), in posterior tibial artery – in 1 (3.3%) and in peroneal artery – 13 (43.3%) cases. Intraluminal angioplasty was used in 70% of treatment of all lesions, while in 30% we performed sub-intimal angioplasty.

Results: Major blood flow to the foot in 1 tibial artery was restored with TLBAP in 19 (63.3%) patients, in 2 arteries – in 7 (23.3%) and in 3 arteries – in 1 (3.3%) patient. In 3 (10%) cases the restoration was impossible. Femoral amputation was performed 7 days after an unsuccessful procedure in 1 patient. Small amputations due to gangrene during in-patient period were carried out in 5 (16.6%). Perforation of tibial artery with compartment syndrome development after conduction recanalization occurred in 1 (3.3%) case. We did not see any other complications or fatal outcomes during in-patient period.

Results of TLBAP were estimated at 3 months after healing of ulcer defects in 27 (90%) patients. These patients were distributed according to Rutherford categories as follows: 1 – 2 (7.4%) patient, 2 – 12 (44.4%), 3 – 8 (29.6%) patients, 4 and 5 – on 2 (on 7.4%) patients.

Conclusions: TLBAP can be successfully performed in 90% of patients with DM, CILE resolved in 85% of patients.

OUR EXPERIENCE WITH AMPLATZER OCCLUDERS USE IN THE TREATMENT OF PATIENTS WITH CONGENITAL HEART DEFECTS

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Purpose of study: to evaluate the possibility of Amplatzer occluders use in patients with septal congenital heart defects and PDA.

Material and methods: endovascular closure of secondary atrial septal defects was performed in 19 patients aged from 2 to 12 years. The size of secondary atrial septal defect varied from 5 to 26 mm (on the average – 11 mm).

PDA was closed with Amplatzer occluder in 4 patients.

The diameter of PDA varied from 3 to 5 mm. One patient had 3rd degree pulmonary hypertension, with concurrent shunting through the PDA.

In one case Amplatzer occluder was used for the closure of muscular VSD.

All procedures were performed in the cathlab equipped with INTEGRIS ALLURA 5000 (PHILIPS) apparatus, under transthoracic and transoesophageal EchoCG monitoring using VIVID 7 (GENERAL ELECTRIC) machine.

Results: in total 20 Amplatzer occluders were implanted in 19 patients with ASD. In one case a second ASD, not diagnosed previously, was revealed after occluder implantation; it was closed with the second occluder. It is worth noting that while comparing ASD size determined with EchoCG and Следует учесть то обстоятельство, что при сравнении размеров ДМПП with calibrating balloon, we revealed a difference – echocardiographic size was underestimated, on the average – by 4 mm.

Intraoperative EchoCH revealed the end of contrast shunting through ASD immediately after occluder implantation in all cases.

PDA was closed in all cases without residual contrast shunting into the pulmonary artery. In one case it was necessary to change the occluder during the procedure, as control aortography revealed significant residual shunting into the PA. A larger occluder was implanted, repeated control aortography did not reveal any residual shunting.

Ventriculography and EchoCG performed after VSD closure did not reveal any residual shunting.

The following complication was encountered with the use of Amplatzer occluders:

One day after occluder implantation in a 4-years-old child, regular EchoCG revealed occluder dislocation with shunting into the right atrium. The patient was urgently transferred to the operating room. During the operation occluder dislocation was confirmed, a 25 mm ASD with a bridge in the center of the septum was revealed; the bridge was attached to the wall of the left atrium. The occluder was removed, the ASD was closed with continuous suture. It is worth noting that the bridge was not detected at EchoCG before and during the procedure. In this case only transthoracic EchoCG was used. Transoesophageal EchoCG was infeasible, as this child was born without the oesophagus which was subsequently formed from the large intestine at the age of 2 years. The presence of a bridge served as a trigger for occluder dislocation.

All patients, including the operated one, were discharged in satisfactory condition. Control EchoCG performed after 3, 6 and 12 months did not reveal ASD recanalization, occluders reposition and intracardiac thrombi.

Conclusions: the use of Amplatzer occluders is effective and safe for the treatment of patients with septal congenital heart defects and PDA.

TRANSCATHETER EMBOLIZATION OF THE PATEN DUCTUS ARTERIOSUS

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Purpose of study: evaluation of the effectiveness of PDA closure using endovascular methods.

Материалы и методы: from January 2003 till December 2007 transcatheter embolization of PDA was performed in 91 patients. The group of study comprised patients aged from 2 to 65 years, among them 32 males and 61 females. PDA diameter varied from 0.5 to 8 mm.

PDA was closed with Flipper Detachable Embolization Coils and Amplatzer Duct Occluder.

Results and discussion: 3 mm coils were predominantly implanted in patients with PDA diameter up to 2 mm (n=24), 5 mm coils – in patients with PDA diameter up to 5 mm (n=61). In two cases of PDA diameter up to 4.5 mm 8 mm coils were implanted. If ductus diameter exceeded 5 mm, Amplatzer Duct Occluder was used. In 3 patients we have used 6/8 mm occluders, in 4 – 8/10 mm.

In one cases during the second coil implantation in the PDA the previously implanted coil migrated into the pulmonary artery. The attempt of trap it was unsuccessful, later the patient was successfully operated on in the department of cardiac surgery.

In order to evaluate the effectiveness of endovascular procedures using Flipper Detachable Embolization Coils the patients were conventionally divided into 2 groups:

Group 1 (n=59, 68%) – patients with successfully closed PDA and absence of pulmonary artery opacification immediately after coil implantation.

Group 2 (n=28, 32%) – patients with insignificant residual opacification of the pulmonary artery after coil implantation. The second coil was implanted only in 3 patients. Control US examination performed in 1 month did not reveal contrast shunting through PDA in any of patients

After PDA closure with Amplatzer Duct Occluder no contrast shunting into the pulmonary artery was revealed in any of 7 patients.

Hence, PDA was closed in 99% of cases.

Conclusions:

1. The use of Flipper Detachable Embolization Coils and Amplatzer Duct Occluder is effective in the treatment of patients with patent ductus arteriosus.
2. Endovascular intervention gives a stable clinical result with minimal amount of complications.

WAYS FOR THE INCREASE OF THE EFFECTIVENESS OF BALLOON ANGIOPLASTY OF PERIPHERAL ARTERIES

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Purpose of the study: to increase the efficacy of transluminal balloon angioplasty of the obliterating atherosclerosis via continuous intraarterial infusion.

Materials and methods of the study: immediate and long-term results of balloon angioplasty for the local (under 5 cm) atherosclerotic stenoses or arterial occlusion in 159 patients were studied. One hundred forty nine (93.7%) of them were males, 10 (6.3%) – were females; age ranged from 42 to 71 years.

Balloon angioplasty of the iliac artery was performed in 104 patients, and femoral, popliteal and crural arteries – in 55 patients. A total of 177 iliac artery angioplasties, 70 femoral, 14 popliteal and 4 crural arteries angioplasties were performed. In 5 patients, the dilation of iliac arteries was accomplished with insertion of 6 stents.

All patients were administered disaggregants (aspirin, plavix) in postoperative course, which lasted from 6 to 12 months. Angioplasty in 22 patients was supplemented with continuous regional medication treatment in the early postoperative period. Infusion included heparin, trental, doxycycline and hydrocortisone.

Results: Complete elimination of stenosis after angioplasty of iliac arteries was achieved in 68 (65.4%) patients, residual stenosis ranging from 10% to 40% was observed in 35 (33.7%) patients. In one patient (0.9%) the angioplasty appeared ineffective due to calcified atheroma.

Complete elimination of stenosis following angioplasty of iliac arteries was achieved in 30 (54.5%) patients, residual stenosis ranging from 40% to 34.5% was observed in 10 (33.7%) patients. In 6 (11%) patients the residual stenosis exceeded 50% and the angioplasty was considered ineffective.

In long-term follow-up lasting from 6 months to 5 years the results of 32 patients from control group

and in 12 patients, who had the angioplasty supplemented with continuous intraarterial infusion, were studied.

Among patients of the control group 13 (86.7%) had consistent clinical benefit, and 2 patients had a restenosis of dilated iliac arteries after the angioplasty, with the recurrence of initial ischemia of the extremity. Following femoral artery angioplasty, one patient had the extremity amputated at the femoral level due to reocclusion and progressive ischemia of the extremity; 8 (62%) had a reocclusion of the arteries with the recurrence of initial ischemia in the limb, and 4 (30%) patients maintained favorable clinical benefit of surgery in long-term follow-up. None of 4 patients have been noted to have consistent clinical benefit in the long-term follow-up after the crural artery angioplasty.

Among patients who received continuous arterial infusion, it was performed via iliac arteries 4 patients, and via femoral arteries – in 8 patients. Following iliac artery angioplasty, their patency was preserved in all cases. Two out of 8 patients with femoral arteries angioplasty developed relapsed thromboses with progressive ischemia of the limb and subsequent amputation; and 6 (75%) patients preserved patency of dilated femoral arteries with a favorable clinical benefit in follow-up period.

Seven patients died during follow up period; 4 out of them died of myocardial infarction, 2 – of stroke and one – of colon cancer

Thus, the best patency in the long-term follow-up was noted after iliac artery angioplasty. Continuous regional intraarterial infusion of disaggregants and anti-inflammatory drugs provides improvement of the results of femoral artery angioplasty in the long-term follow-up.

UTERINE ARTERIES EMBOLIZATION IN COMPLEX TREATMENT OF UTERINE MYOMA

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Study objective was the evaluation of the method of uterine arteries embolization (UAE) as the modern approach to complex treatment of uterine myoma with organ preservation.

Materials and methods Efficiency of uterine arteries embolization was studied in 303 patients aged from 33 to 57 years (mean age 45 years). The size and character of nodes' location were established by US study and hysteroscopy. The myoma up to 10-week pregnancy size was found in 158 (52%) patients, 11-15-week – in 112 (37%), 16-week and more – in 33 (11%). Symptomatic myoma was present in 264 (87%) patients, asymptomatic – in 39 (13%). Anemia was present in 103 (34%) patients, 36 (12%) were sterile.

UAE was used as an independent method of treatment of myomas as well as in combination

with endoscopic myomectomy by laparoscopy and resectoscopy.

Results: 288 patients (95%) were satisfied with the results of embolization, tumor decrease was noted in 273 (90%), symptoms disappeared in 288 (95%).

We consider, that one of our main achievements consists in the elimination of diagnosis "myoma" in 30 patients (10%). This result was achieved in 10 women after the application of UAE alone. These patients had a single myomatous node (3 to 5 cm) situated interstitially and subserously in the back wall of the uterus and not deforming its cavity. The nodes regressed totally after 6 months. In 8 patients 1-4 months after UAE the parturition of large necrotized nodes (diameter 8 to 12 cm) took place, which required surgical intervention. The use of laparoscopic myomectomy 306 days after the embolization allowed to remove subserous nodes measuring 5 cm at the base (total size 10 to 15 cm) with minimal hemorrhage (from 10 до 30 ml) in 12 patients. One of them underwent simultaneous resectoscopy of a submucosal node with up to 2 cm diameter.

Conclusions: combination of UAE with endoscopic myomectomy allows to use this method in the treatment of myoma with several nodes, including a subserous one. The combination of methods in case of submucosal location of one of the nodes allows to reduce menstrual periods and relieves the patients from necrotic node suppuration and the necessity of antibacterial therapy. The combination of methods leads to significant reduction of tumor and uterus total size, and in some cases the diagnosis of myoma can be abolished.

ANGIOPLASTY AND ENDOGRAFTING OF THE SUBCLAVIAN ARTERIES

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Stenotic lesions and occlusions of proximal segment of the subclavian arteries (SA) are encountered in 12% of patients with peripheral atherosclerosis.

The main clinical manifestations are subclavian steal syndrome, arm weakness and pains. The examination of such patients reveals hemodynamic disturbances (different AP in the left and right arms, Doppler data).

Percutaneous balloon angioplasty (PTA) and endografting of the damaged segments of the subclavian arteries is one of the effective methods of intervention in this pathology.

Purpose. To evaluate the possibilities and the results of PTA in subclavian arteries lesions.

Methods. 38 patients with subclavian arteries lesions have been treated in the CELT clinic. Stenotic lesions were revealed in 17 of them (with stenosis degree from 70 to 95%), 21 patients had occlusions of the proximal segment of a subclavian artery. Clinical

manifestations were seen in 31 patients (neurological symptoms – in 11, hemodynamic disturbances – in 25, arm weakness – in 5). In 7 cases subclavian lesions were revealed only during angiography of the aortic arch branches.

Before angioplasty all patients underwent US Doppler study and angiography, pressure gradient was revealed and measured.

Nine patients underwent balloon angioplasty, and taking into account its satisfactory results, stenting was not performed.

Stenting was applied in 29 patients (30 stents were implanted). In most cases it was possible to eliminate residual hemodynamic disturbances with 1 stent implantation. Two stents were implanted in one patient with prolonged lesion.

Results. Positive immediate results were obtained in all patients, only in one case recanalization of chronic SA occlusion was impossible. Taking into account the signs of subclavian steal, we performed angioplasty of the internal carotid artery stenoses in this patient. Mean duration of in-hospital stay was 2 days. No severe complications were noted in the group of study. Long-term results (from 1 to 7 years) were studied in 24 patients. Control US Dopplerography and angiography were carried out. No occlusions or reocclusions were revealed in the restored segment. In 6 cases we revealed the signs of beginning restenosis (not influencing hemodynamics), which did not require repeated intervention. Clinical improvement was seen in all patients.

Conclusion. Percutaneous balloon angioplasty (PTA) allows to achieve satisfactory immediate and long-term results, to avoid more traumatic open intervention, to improve the quality of life in the majority of patients with occlusions and stenoses of the subclavian arteries.

CORONARY ARTERIES PERFORATION AS A COMPLICATION OF PTCA

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Coronary arteries perforation (CAP) during percutaneous transluminal coronary angioplasty (PTCA) is an uncommon but dangerous and life-threatening complication. At the early stages of development of PTCA the frequency of CAP was in 0.1-3%. The rate of this complication is higher (0.3-3.5%) with the use of various mechanical devices such as rotoablation atherotomy and excimer laser angioplasty. In whole, during last years, due to the improvement of techniques and accumulation of experience, the rate of CAP varies from 0.2 till 0.8% of all coronary interventions.

Due to the use of appropriate procedural tactics and the advent of drug-eluting coated stents the fre-

quency of cases treated without surgical intervention has increased from 46% to 71.7%. According to different authors, death rate from CAP has decreased from 25 to 5-10%.

From 1993 to 2007, a total of 3512 of PTCA were performed in the CELT, among them – 582 recanalizations. 73 interventions (12.5% of all recanalizations) were unsuccessful. Coronary artery perforation of Ellis type 3 occurred in 7 cases (0.23% of 3512 interventions). This complication was treated by endovascular methods in 6 patients, thoracotomy was necessary in 1 case.

The most frequent causes of coronary perforations were: 1) perforation by guide tip, 2) balloon angioplasty after successful passage of chronic coronary occlusions with the guidewire.

The evaluation of risk factors, selection of effective techniques, surgical armaments and adequate strategy in cases of this complication allows to reduce death rate and the necessity of open surgery.

ENDOVASCULAR TREATMENT OF PATIENTS WITH VASORENAL HYPERTENSION

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Purpose: study of immediate and long-term results of renal stenting in patients with vasorenal hypertension.

Material and methods: the procedures were performed in 157 patients with vasorenal hypertension, among them 119 men and 38 women, aged from 18 to 72 years. Duration of hypertension was from 4 to 25 years. Mean systolic ABP was 196.4 ± 34.6 mm Hg, diastolic – 100.4 ± 14.5 mm Hg. Clinical diagnosis of vasorenal hypertension was confirmed by duplex scanning and helical computer tomography. In 43 cases critical stenoses with kidney dysfunction were found. Stenoses exceeding 70% of the diameter of intact arterial segment were revealed in 114 patients, 50%-70% stenoses – in 69 patients. Balloon angioplasty was performed in all patients; in 149 of them stenting was performed. Control US examination was carried out in 6 and 12 months.

Results: Results of angioplasty and stenting were followed for 12 months in 134 patients (85%). Almost 17% of patients have completely withhold hypotensive drugs, 63% of patients reported considerable decrease of therapeutic doses, significant arterial hypertension caused by parenchymal kidney dysfunction (nephrosclerosis, nephropathy) persisted in 27% of patients. In 16 patients (10.2%), among them – 5 after stenting procedure, restenoses of various degree were found; in 11 patients with hemodynamically significant restenoses repeated angioplasty and endoprosthesis were performed with good clinical effect.

Conclusion: Long-term results of renal angioplasty allows to define it as a method of choice for the treatment of patients with renal arteries lesion and vasorenal hypertension.

RANDOMIZED COMPARISON OF TRANSRADIAL AND TRANSFEMORAL APPROACH WITH THE USE OF HEMOSTATIC DEVICES IN CORONARY ANGIOPLASTY

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Purpose: the choice of optimal approach site for percutaneous transluminal coronary angioplasty (PTCA).

Materials and methods: Since May 2005 in the Department of cardiovascular surgery of the Centre of Endosurgery and Lithotripsy a randomized mono-center study aimed at the comparison of transradial (RA) and transfemoral approaches (FA) with the use of hemostatic devices in PTCA was started. Primary cases with stable angina and acute coronary syndrome were included into the study.

The study comprised 128 patients – 64 in each group. In RA group there were 50 men and 14 women, in FA group – 48 men and 16 women. Mean age of patients in RA group was 60 years, in FA group – 57 years. Diabetes mellitus was presented in 21 patients with RA and in 31 patients with FA. Hyperlipidemia was found in 57.6% of patients in RA group and in 63.1% in FA group. There were 46.3% smokers in RA group and 47.8% in FA group. Acute coronary syndrome was found in 28% with RA and in 34% with FA.

Puncture time (sec.), size of introducer (F), time of introducer insertion (sec.), necessity of introducer replacement (sec.), time before selective catheterization (sec, total time of procedure (min.), exposition time (min.), total radiation dose (mGy/cm²), volume of contrast agent (ml, without ventriculography) were taken into account while evaluating the characteristics of angiographic study. Significant differences in these indices between the compared groups weren't found.

Radial artery spasm was prevented by intraarterial administration of verapamil+nitroglycerine+heparin. IIb/IIIa receptors inhibitors were used in 1 patient with FA.

Statistical data processing was made with SPSS-PC software package.

Early usage of suturing devices after FA; negative Allen's test; lack of radial and femoral pulsation; expected hemodynamic deterioration during PTCA leading to intraaortic balloon counterpulsation; expected necessity of pacemaker implantation; cardiogenic shock; history of CABG were considered as exclusion criteria.

Endpoints were: 1) access-related: decrease of hemoglobin level, controllable bleeding; 2) PTCA-related: residual stenosis > 50%, death, AMI, CABG.

Endpoints were estimated in the first day at patient randomization, 3 days after PTCA and 6 months after PTCA.

The devices used for active hemostasis included: Perclose in 9 patients (14%) and Starclose in 6 patients (10%) (Abbott Vascular), Vasoseal in 16 patients (25%) and On-Site in 2 (3%) patients (Datascop Cook), Vascular Closures Device in 31 patient (24%).

Results: Paracatheter hematoma was found in 23 patients with RA and in 10 patients with FA (significant difference).

Introducer replacement was required in 29 patients with RA and in 8 patients with FA. The volume of contrast used did not significantly differ between the groups (RA – 165 ml, FA- 150 ml). Exposition time with RA was 23.2 min., and with FA – 17.5 min. (significant difference); procedure time (min) and accumulated radiation dose (mGy/cm²) were not significantly different. Bifurcational stenting was performed in 23.6% of patients with RA and in 23.8% with FA, direct stenting – in 70% and 73%, respectively; the number of stents was not significantly different. Blood flow TIMI-3 was reached achieved in 100% of cases in both groups. Significant difference in activation time between group with RA (2.6 h) and FA (3.2 h) was found.

Conclusions: There were not significant differences in the rate of major complications, such as dissection, bleeding, pseudoaneurysm, between the groups of RA and FA with application of closure devices. Also there were no significant differences in approaches' functionality, their traumaticity and "comfort"

Arterial spasms, occlusions and formation of subcutaneous hematoma were more common in RA group.

The advantages of hemostatic devices as compared with manual hemostasis aren't fully studied. Cost of the closure device is the additional limiting factor actual for our country.

Finally, the choice of the approach is at surgeon's option.

USE OF ANGIOPLASTY IN LESIONS OF TERMINAL AORTA

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Purposes: estimation of short- and long-term results of recanalization and angioplasty in isolated chronic atherosclerotic occlusions and stenoses of terminal segment of the aorta.

Material and methods: 17 patients were treated. Their mean age was 63.4 years. Recanalization of occlusions of terminal aortic segment was performed in 12 patients; in 5 cases hemodynamically significant stenoses were eliminated. Mean length of lesion was 7.6 cm. 21 stents were implanted (2 Wallstent, 19 – ZA stent).

Results: Positive immediate results were achieved in all cases. Mean duration of in-hospital stay was 2.5 days. Soft tissues hematoma revealed early after the procedure in 1 case was treated by conservative means, with the use of compressive bandages. Long-term results were followed up to 7 years in 9 patients.

Primary permeability was found in 7 patients; stenoses were revealed in 2 cases, occlusions were not found.

Successful repeated angioplasty with blood flow restoration was performed in all patients.

Conclusion: Recanalization and stenting of terminal aortic segment are successful in most cases, the long-term results are good. Advantages: no need in general anesthesia and abdominal approach, lower cost and death rate, short duration of procedure and in-patient period. Such patients require compulsory regular out-patient follow-up with definition of ankle-brachial index at least once every six months.

ANGIOPLASTY OF THE ILIAC ARTERIES

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Purpose: analysis of the effectiveness of recanalization and angioplasty of atherosclerotic occlusions and stenoses in bifurcational lesions of aortoiliac segment.

Material and methods: We have treated 191 patients with this pathology. Mean age of patients was 58.2 ± 2.1 year. 2nd degree chronic arterial insufficiency was present in 112 patients, 3rd -4th degree – in 79. Occlusions of common iliac artery were revealed in 63 patients, of external iliac artery – in 83, extensive occlusion of the common and external iliac arteries – in 28, in 188 cases stenoses of the common or external iliac artery were found. All patients had bifurcational lesions. Along with this, 123 patients (64.4%) had significant distal arterial lesions.

Recanalization was performed with hydrophilic guide. Endografting was performed during angioplasty. In total, 632 stents were implanted.

Results: Good immediate results were found in 93% of patients with occlusions and in 100% – with stenoses. Thrombosis in the puncture site was found in 3 cases, while thrombosis of angioplasty area, requiring bypass surgery – only in 2 cases. Microembolism was found in 4 patients, perforations – in 3, false aneurysm – in 4 cases, arteriovenous fistula – in 2 cases. Three patients died in early post-operative period (1.5%).

5-years results were followed in 76 patients. Absence of significant hemodynamic lesions in the area of intervention was noted in 84% of patients. In 6 cases significant hemodynamic stenoses were found in the area of angioplasty (7.9%). Reocclusion in the

site of procedure was revealed in 4 cases (5.3%). Successful repeated angioplasty was performed in cases of stenoses. Thus, taking into account successful repeated angioplasty, good long-term results were achieved in 94.7%.

Conclusion: Endovascular recanalization for the treatment of Leriche syndrome is feasible regardless of the length and age of occlusion. Our results are not inferior to reconstructive operations in this area and, in consideration of minimal invasiveness, method of recanalization and balloon angioplasty with endografting should be preferred.

ENDOVASCULAR TREATMENT OF THORACIC AORTA ANEURYSMS

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Treatment of thoracic aorta aneurysms as recently become an actual problem in endovascular surgery, attractive due to its low traumatism, good immediate and long-term results of interventions.

Purpose of study. Analysis of the results of clinical use of drug-eluting nitinol ZA-stents in the treatment of thoracic aorta aneurysms.

Material and methods. Endografting with the use of self-deploying nitinol drug-eluting stents was performed in 31 patients with aneurysms of descending thoracic aorta. Linear stent-grafts were used in their treatment. Mean age of patients was 74.8 ± 8 years. Stent-grafts on the base of ZA-stents with thin Dacron coating were used in 18 patients. Zenith system (Cook) was applied in 13 cases.

Results. Good immediate results (complete isolation of aneurysmal cavity, absence of leakage) were achieved in 18 patients. The long-term results were followed for 2 to 5 years. The 5-year survival rate was 82%.

Conclusion. Analysis of immediate and long-term results of descending thoracic aorta endografting with the use of self-deploying nitinol Dacron-coated stents shows the perspective of this trend and allows to use it as an alternative for open reconstructive surgery, providing strict selection criteria are fulfilled.

ANGIOPLASTY FOR BRACHIOCEPHALIC TRUNK LESIONS

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Study objectives: to analyze short- and long-term results of endovascular interventions in occlusive and stenotic lesions of brachiocephalic trunk.

Material and methods: 13 patients (10 men, 3 women). Mean age 59.8 years. Recanalization of occluded arteries was performed in 2 patients, angioplasty with stenting of stenoses – in 11 patients.

Recanalization was performed in accordance with standard technique with hydrophilic guides. Angioguard filters were used for eventual embolism prevention. Mean length of occlusion was 2.9 cm. 13 stents were implanted (1 Wallstent, 12 – ZA stent).

Stenting rate was 1.2 stent/artery.

Results: Good immediate results were noted in all cases. Mean hospital stay was 2 days. Long-term results were followed for up to 5 years in 6 patients. Primary permeability was noted in 5 cases, stenoses were found in 1 patient, occlusions weren't revealed. Successful repeated angioplasty with blood flow restoration was performed in this patient. Secondary permeability – 100%

Conclusion: Recanalization and stenting of brachiocephalic trunk allow to achieve success and good long-term results in most cases. No necessity of general anesthesia, absence of blood flow occlusion, lower price and death rate, short time of procedure and in-patient time are the advantages of this method.

ENDOVASCULAR TREATMENT OF INFRARENAL ABDOMINAL AORTA ANEURYSM

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Purpose: analysis of the immediate and long-term results of endovascular treatment of infrarenal abdominal aorta aneurysms.

Materials and methods: Since 1995 to 2007 endovascular treatment (endografting) of abdominal aorta aneurysms was performed in 116 patients, mean age of patients – 75.3 years. Sex ratio (male/female): 99/17.

Access types: 78 cases were performed through percutaneous approach, 38 – through femoral arteriotomy.

Diameters of delivery system – 14-16-22 F.

Devices of original design on the basis of ZA-stent were used for endografting.

Since 1995 to 1998 polyethylene and polyurethane coating were used; only linear and unilateral endografting (EG) was performed (total number of patients – 36).

Since 1998 to 2007 only superthin Dacron (Vascutec) coating and bifurcational Dacron woven prosthesis (Vascutec® the USA) were used, bifurcational endografting was introduced into practice.

In total, at the second stage 80 patients were operated: 58 received ZA-stents, 21 Zenith system (COOK®) and in one case «ExluderTM» (GORE®) was used.

Types of endografting operations at the second stage: 30 linear, 8 unilateral with crossed bypass and 42 bifurcational.

It is necessary to notice that since 2005 only brand-name systems for bifurcational endografting were used.

Results: In the first group good immediate results (total isolation of aneurysmatic cavity, absence of leakage) were noted in 22 patients (61%), satisfactory results (distal leakage) – in 8 patients (22%), unsatisfactory results (proximal leakage) in 6 patients (17%).

The results in the second group were totally different: good immediate results were noted in 78 patients (97.5%), satisfactory results (distal leakage) – in 2 patients (2.5%), no unsatisfactory results were noted.

The long-term results were followed up to 9 years in 51 patient of both groups.

Good results (total leak tightness of aneurysmatic sac, absence of leakages) were found in 35 patients (68.7%).

Dislocation or fracture of the stent-graft occurred in 4 patients – (7.8%).

Successful repeated endovascular intervention (implantation of additional stent-graft) was performed in these patients. In 4 patients (7.8%) leakages of various types were noted and additional interventions were not performed.

In 8 patients (15.7%) the extension of process with increase of aneurysmatic cavity size (caused by different types of leakage) was found. They underwent "traditional: surgical intervention – aorta replacement. Two of them died during in-hospital period.

Three patients died from aneurysm rupture, 7 – from other reasons (stroke, myocardial infarction). 7-year survival rate was 77%

Conclusion: development of intervention technique (first of all – bifurcational endografting) and devices improvement allow to improve both immediate and long-term results. This method can be used as an alternative to open reconstructive surgery in patients with high surgical risk. Good survival rate is noted in the long-term, however there is a need in repeated endovascular and surgical interventions.

TACTICS OF ENDOBILIAR INTERVENTIONS IN PATIENTS WITH OBSTRUCTIVE JAUNDICE OF TUMOROUS ETIOLOGY

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Purpose of study. Evaluation of rationality of different protocols of transhepatic endobiliary interventions in patients with obstructive jaundice of tumorous etiology.

Material. From January 01, 2003 till September 20, 2007 transhepatic endobiliary interventions were performed in 84 patients with obstructive jaundice of tumor etiology. Patients were aged from 33 to 91 (mean age 60.7) years. Duration of obstructive jaundice varied from 7 to 30 days (mean 18.5 days). Bilirubin level ranged from 32.9 to 547.7 (mean – 255.1) $\mu\text{mol/L}$.

In 47 (55.95%) cases the final intervention was palliative stenting of bile ducts, in 37 cases (44.05%)

– external-internal draining, in 26 (70.3%) observations out of these, it was selected as final stage of treatment, and in 11 (29.7%) – as measure of preoperative management of patients.

One-stage endobiliary intervention was used in 8 out of 47 (17.02%) patients who underwent stenting of bile ducts. In 6 patients it was concluded with control draining of bile ducts, and in 2 patients – with filling of puncture canal immediately after the interventions.

In 39 (82.98%) patients the protocol of endobiliary stenting was two-stage. External-internal bile drainage was used as the first stage, and after 3-14 days (mean 8.3 days) endoprosthesis of hepaticoholedoche was performed.

In 43 (91.5%) observations, balloon dilation was preceded to bile ducts stenting; in 4 patients stent implanting was performed without previous bougienage. In 36 (76.6%) cases postdilatation of the implanted stent was performed.

Results. Eleven (29.7%) patients who underwent bile ducts draining were operated later on. The following operations were performed: 3 pancreaticoduodenal resections, 3 bihepaticojunostomies, 4 hepaticojunostomies, and 1 liver transplantation.

Duration of hospital stay after palliative external-internal draining was on the average 10-27 days (19.75), life span after discharge was on the average 1-9 months (150 days). Four (15.4%) patients required ambulatory replacement of drainage tube due the recurrence of obstructive jaundice or cholangitis within 48-210 days (on the average 115 days).

Duration of hospitalization after one-stage stenting was on the average 12.7 days. Six (75%) out of 8 patients were discharged in fair condition after complete resolving of symptoms of obstructive jaundice; life span after stenting in these patients ranged from 1 to 36 months (mean 18.5).

Two (25%) patients died from the intensification of extremely severe hepatorenal failure on the background of marked bilirubinemia (over 520 $\mu\text{mol/L}$) related to late hospitalization.

Complications of one-stage endobiliary stenting in the form of hemobilia were observed in 2 patients, that we believe to be associated with performing of pre- or postdilation resulted in traumatization and contact bleeding of choledoch mucosa infiltrated by the tumor rather than with the procedure of stent implanting.

After two-stage stenting 3 patients died during in-hospital period from the aggravation of multiple organ failure, carcinous cachexia or stenting complications (hemobilia, biliary-venous fistula, early stent occlusion). Thirty eight (97.4%) patients were discharged from hospital; duration of in-hospital stay in these patients was on the average 22.3 days. Life span in the long-term follow-up period ranged from 0.5 to 36 months (mean 18.5). Within 1-18 months 3 patients (7.9%) required additional endobiliary interventions related to recurrence of obstructive jaundice, tumor invasion through the stent lumen or tumor growth over the proximal border of the stent.

Conclusions. Transhepatic external-internal biliary drainage is an effective measure for management of patients with obstructive jaundice of tumor etiology before radical surgical interventions.

For the palliative treatment of patients with this pathology, optimal protocol of transhepatic endobiliary interventions adapted to severity of cholemia and hepatorenal failure suggests preferable one-stage or two-stage stenting of hepatic and common bile ducts, and if it is impossible, then long-term external-internal biliary draining can be performed.

Predilatation of bile duct is advisable only in case of rigid strictures impeding one-stage intervention. Postdilatation of endobiliary stents should be made only in cases of its metal construction deployment on less than 40% of initial diameter.

INTERVENTIONAL TECHNIQUES IN THE TREATMENT OF PATENT DUCTUS ARTERIOSUS AND ATRIAL SEPTAL DEFECT

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Objectives: To reveal the efficacy and evaluate immediate outcomes of endovascular transcatheter occlusion of patent ductus arteriosus (PDA) and secondary atrial septal defect (ASD).

Materials and methods: Eighty three procedures of transcatheter occlusion of patent ductus arteriosus and 37 ASD closures were performed in at the X-ray surgery department of Samara Regional Clinical Cardiology Dispensary from 2003 till September 2007. The age of patients with PDA ranged from 2 months to 35 years; 29 (34.9%) patients were males and 54 (65.1%) – females. The age of patients with ASD ranged from 3 to 51 years; 7 patients were males and 30 – females.

All patients with PDA underwent the procedure of X-ray-endovascular occlusion with a: «Flipper» coils (COOK, Denmark) – in 70 (84.3%) patients; Amplatzer® Duct Occluder system (AGA Medical Corporation, USA) – in 13 (15.7%) patients. Duct occlusion with one coil was performed in 63 cases, with two coils – in 5 cases, and with three coils – in 2 cases. In three cases the coil occlusion was performed in patients with recanalization of the ductus arteriosus after surgical ligation.

All 37 ASD closures were performed with the use of Amplatzer® Septal Occluder system (AGA Medical Corporation, USA). The implantation of the system was performed under both fluoroscopic and echocardiographic guidance with the verification of the adequacy of occluder position against caval and pulmonary vein orifices, coronary sinus and atrioventricular valves.

Results: immediate PDA occlusion, confirmed by control aortography in 10 minutes was achieved in

64 (77.1%) cases; in 6 (7.2%) patients with residual shunting after the coil implantation, the occlusion was confirmed by echocardiography the next day, and in 13 (15.7%) patients with the Amplatzer occluder implantation, the occlusion was verified within 3 days.

The absence of immediate left-to-right shunt at the interatrial septum was confirmed by echocardiography during the operation in 30 (81.1%) patients with ASD. Another 3 (8.1%) patients had the occlusion verified the next day. In two patients with large ASD we were failed to place the occluder adequately in the defect, therefore, the occluder was removed from the cardiac cavity; in another two patients with deficiency of the upper edge of septum the dislocation of part of the occluder took place. These patients underwent successful classic surgery.

Conclusions:

1. The technique of transcatheter occlusion of PDA and ASD has proved high efficacy in correcting these congenital heart defects.
2. With strict adherence to the indications and surgery techniques the complications are virtually absent.
3. Cosmetic effect – absence of postoperative scars.
4. The length of in-hospital stay is reduced from 12-14 to 3-4 days.

ENDOVASCULAR INTERVENTIONS IN ACUTE CORONARY SYNDROME

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Purpose of the study: to evaluate the feasibility and efficacy of endovascular methods in the treatment of patients with acute coronary syndrome (ACS).

Materials and methods: 301 patients with acute coronary syndrome (ACS) underwent urgent intracoronary interventions in the X-ray surgery department of Samara Regional Clinical Cardiology Dispensary since 1998.

Two hundred eighty six (95%) patients were males and 15 (5%) – females. According to the time period following onset of anginal attack, the patients were divided as follows: up to 6 hours – 250 (83.1%) patients, 6 to 12 hours – 32 (10.6%), over 12 hours – 19 (6.3%) patients.

One hundred sixty (53.2%) patients were revealed to have the occlusion of infarct-related artery, 141 (46.8%) patients – critical stenosis. One hundred fifty two patients had a lesion in the territory supplied by the LAD, 62 (20.6%) – by the circumflex artery, 83 (27.6%) – by the right coronary artery, and 4 patients had the infarct-related lesions in two vascular territories.

Results: successful recanalization and angioplasty was performed in 290 (96.3%) patients; in 263

(90.7%) out of them the procedure was finished by stenting.

The blood flow TIMI III through infarct-related artery was achieved in 263 (90.7%) cases and in 27 (9.3%) cases – TIMI II was achieved. TIMI I blood flow was achieved in 3 patients. Recanalization of infarct-related artery failed in 8 cases (2.7%).

In post-procedural period clinical picture of angina was absent in all patients with restored blood flow in the infarct-related artery. Ten (3.3%) patients had complications: in 4 cases – subacute thrombosis of the artery, in 5 cases – acute thrombosis of the artery, in 1 case – artery perforation with the guide during recanalization, which was successfully treated conservatively. Two out of 10 patients underwent coronary artery bypass grafting, 5 – successful repeated angioplasty, and 2 patients with acute thromboses died.

Conclusions:

1. Endovascular surgery in patients with ACS is an effective and safe treatment option.
2. In overwhelming majority of cases this method provides restoration of adequate blood flow through the infarct-related artery.

PERCUTANEOUS TRANSLUMINAL ANGIOPLASTY OF THE LEFT MAIN CORONARY ARTERY: OUR FIRST EXPERIENCE

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Purposes: evaluation of the effectiveness, immediate results and safety of percutaneous transluminal angioplasty (PTCA) and stenting of “unprotected” left main coronary artery (LCA).

Material and methods: Five patients with the lesion of the left main CA trunk underwent endovascular interventions in the X-ray surgery department of Samara Regional Clinical Cardiology Dispensary. One patient (20%) underwent PTCA, and in 4 patients (80%) the stenting procedure was performed. All the patients at the moment of intervention had an “unprotected” LCA trunk, in 4 patients the procedure was elective, and in one case PTCA was had to be performed urgently due to complicated coronary angiography. All the patients had stable angina of functional class III-IV. In one case the angiographic picture of the lesion of LCA was represented by isolated segmental stenosis in the middle third, and in 4 cases – by type 1 bifurcational lesion with involvement of proximal segments of the left anterior descending artery and circumflex artery. One patient (20%) underwent “direct” stenting of the left main, one – bifurcational angioplasty with “kissing balloons” method, and three patients (60%) – bifurcational stenting of the LCA involving the major arteries’ ostia. Two patients underwent bifurcational stenting with “crush”-technique, one – with modified T-stenting technique. All the bifurcational stenting procedures were finished

by “kissing” angioplasty with nominal size balloon catheters.

Results: angiographic success of the intervention (adequate TIMI III blood flow) was achieved in 4 cases (80%), in one case the suboptimal result was caused by residual 50% stenosis after urgent PTCA. No immediate complications were noted after endovascular interventions.

Conclusions: the stenting of the left main coronary artery in patients with stable angina is a quite effective and safe treatment option. Endovascular method can be an alternative to coronary artery bypass grafting, especially in isolated segmental lesion of LCA. In patients with acute coronary syndrome this method can be used as a “palliation” for faster stabilization of patient’s condition before eventual successful coronary artery bypass grafting.

PREVENTION OF COMPLICATIONS IN INTERVENTIONAL NEURORADIOLOGY

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220 patients underwent endovascular neurosurgical interventions. The complications occurred in 7% of patients with cerebral arterial aneurysms (hemorrhagic – 4%, ischemic – 3%) and were related to intraoperative aneurysm ruptures, microcoil migration into the vascular lumen. With the advent of new endovascular instruments it became possible to prevent many of these complications. Arterial aneurysms with a wide neck and fusiform aneurysms are embolized with the balloon assistance technique: simultaneously with the insertion of embolizing microcoils into the aneurismal cavity an intracranial balloon is inflated on the neck level preventing coils dislocation from the aneurismal cavity. Intracranial stents can be used for the same purpose. Similar technique is possible in cases of carotid-cavernous fistula division with the preservation of antegrade blood flow in the internal carotid artery.

The rate of ischemic and hemorrhagic complications encountered during endovascular treatment of arteriovenous malformations, arterio-sinusal and dural arteriovenous fistulae was 6% and 3.3%, respectively. These complications were related to poorly controllable advancement of the embolizing agent within the afferent and efferent vessels. It was possible to prevent these complications with the use of last generation polymer embolizer (ONYX).

The use of stent-grafts in carotid-cavernous fistulae and nasal bleedings, related to pseudo-aneurysm formation in the main sinus allows to preserve the blood flow in the internal carotid artery and to avoid severe ischemic complications of deconstructive operations in patients with compromised cerebral arterial circulation.

The use of modern endovascular instruments allows to avoid severe complications in interventional neuroradiology.

DIRECT STENTING IN Q-WAVE AND NON-Q-WAVE MYOCARDIAL INFARCTIONS

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Purpose: to show the effectiveness of direct stenting of the infarct-related artery in the treatment of myocardial infarction.

Material and methods: from 2004 to 2007 we have studied 241 patients with Q-wave myocardial infarction, 27 of whom underwent direct stenting of the infarct-related artery (Group 1), and 174 patients with non-Q-wave myocardial infarction, 48 of whom underwent direct stenting of the infarct-related artery (Group 2).

In Group 1 endovascular treatment was carried out within the first 6 hours after the onset of MI. Endovascular treatment in Group 2 was performed within the first 2 days after the onset of MI.

The procedure was successful in all patients from Group 1. We did not reveal in-stent stenoses and other hemodynamically stenoses within 6 months after the procedure, no thromboembolic complications were noted.

In Group 2 two patients had signs of in-stent restenosis three and four months after the procedure, respectively (requiring repeated endovascular interventions). In order to restore the blood flow complete myocardial revascularization by PTCA and stenting was subsequently performed in 6 patients.

Clinical examination carried out 6 months – 1.5 years after the procedure revealed:

Group 1: absence of angina signs in 27 patients (100%). Long-term mortality: 0 patients (0%).

The increase of myocardial contractility (as judged by contrast ventriculography) was noted in 9 patients (33%).

Group 2: absence of angina signs in 46 patients (96%). Two patients (4%) required repeated endovascular procedures. Long-term mortality: 0 patients (0%).

Myocardial contractility (as judged by contrast ventriculography) was not significantly changed.

Conclusions: Direct stenting of the infarct-related artery in Q-wave and non-Q-Wave MI smoothes the course of reperfusion syndrome and decreases the risk of intraoperative complications.

RESULTS OF THE USE OF BARE METALLIC STENTS BX SONIC AND BX VELOCITY IN PATIENTS WITH DIFFERENT FORMS OF CHD

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(Moscow)

Purpose. Study of immediate and mid-term clinical and angiographic results of coronary stenting with matrix stents of similar “design”: BX Sonic and BX Velocity (Cordis, Johnson & Johnson).

Material and methods. From January 2000 to March 2005, 567 patients underwent stenting procedure in Moscow City Center of Interventional Cardioangiologiy. In total 701 BX stents (176 BX Velocity and 525 – BX Sonic) were implanted into 667 coronary arteries. Mean age of patients was 58 ± 12.4 years (from 32 to 83), the vast majority of them were males – 472 (83.2%). In most cases examination and treatment were carried out for exertional angina of different functional classes (CCS classification) – 351 (61.9%); painless form of angina was diagnosed in 5 patients (0.9%). Unstable angina was present in 138 patients (24.3%); myocardial infarction – in 73 (12.9%). On the average 7.8 ± 2.4 months after stenting control examination (including coronary angiography) was performed in 329 (58%) patients; the state of 389 prostheses (87 – BX Velocity and 302 – BX Sonic) was assessed.

Results. Immediate angiographic success of the procedure was achieved in 98.6%, complications rate – 1.4%. These complications included: threatening dissection at the distal stent edge (0.7%), occlusion of a hemodynamically significant lateral branch (0.3%), no-reflow effect (0.3%), perforation of a coronary artery (0.1%). Uncomplicated in-hospital course after stenting was noted in 95.4% of cases, hospital mortality was 0.5%. Comparative analysis of two stents (BX Sonic and BX Velocity) did not reveal any significant differences in such indices as in-stent stenosis and in-stent occlusion. According to control coronary angiography data, in the mid-term the frequency of restenosis inside the stent and in the adjacent segments ($+5$ mm) in the total group of patients was 36%, of in-stent occlusion – 2.6%. Clinical improvement (a decrease of angina functional class by 1-2) was noted in 266 (80.9%) out of 329 examined patients. Significant increase of physical tolerance was noted (from 67.1 ± 8.6 to 92.2 ± 7.9 Wt, $p < 0.01$). The need in nitrates (87.8% vs. 45%, $p < 0.05$) and β 1-adrenoblockers (85.1% vs. 63.5%, $p < 0.05$), decreased significantly after stenting. At the same time we did not see significant changes in the intake of ATP inhibitors, calcium antagonists, diuretics. Correlation analysis revealed significant increase of restenosis development in patients with baseline type C lesions as compared with types A and B1 ($R = 0.742$; $p < 0.01$ и $R = 0.270$; $p < 0.04$). A positive reliable correlative relation was revealed between ostial and proximal lesion of the LAD and restenosis development ($R = 0.280$; $p < 0.02$); reliable reverse correlative relation was revealed between unfavorable long-term results of stenting (restenosis or occlusion) and the diameter of the stented segment < 3.0 mm immediately after PTCA ($R = -0.302$; $p < 0.03$). In the absence of these risk factors the incidence of in-stent stenosis was only 8.6%, while in the “high risk” group it was 51.4% ($p < 0.002$)!

Conclusions. The use of matrix stents BX Sonic and BX Velocity allows to achieve optimal immediate angiographic results in the vast majority of cases (98.6%). Our work has shown that the use of “bare”

stents of BX family can be recommended in patients with A-B1 lesions of the RCA, CxB of the LCA and middle segment of the LAD, with vessel's diameter > 3.0 mm with optimal immediate effect and good mid-term results. Long-term results of these stents use in proximal lesions of the LAD (C type) are not too comforting, suggesting the necessity of use of other, probably, drug-eluting stents in these situations.

ENDOVASCULAR TREATMENT OF PATIENTS WITH COMBINED CORONARY AND CEREBRAL ARTERIAL LESIONS

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The increase of life expectancy in the 20th century led to re-distribution of the age composition of the population with the increase of the share of elderly and old people. Among 1716 patients with coronary heart disease who underwent PTCA with stenting in our hospital, 529 patients (30.8%) were over 60 years. On the one hand, multifocal atherosclerotic lesions are typical for this category of patients, on the other hand, they are related to the problem of the choice of method the and the order of treatment. Simultaneous operations of CABG and carotid endarterectomy, besides being associated with high surgical risk, as a rule, require the participation of two surgical teams and the increase of the time of surgery. In the group of patients over 60 years, critical coronary lesions were accompanied by stenotic lesions of the cerebral arteries in 15 cases. Patients' age varied from 62 to 77 years. In one case coronary pathology was associated with critical stenoses of both internal carotid arteries. In four patients the stenoses of carotid arteries were associated with two-vessel coronary lesions. And in 2 cases there were chronic coronary occlusions. All patients underwent simultaneous PTCA with stenting of the coronary and carotid arteries. A patient with bilateral carotid lesions underwent a delayed stenting of contralateral carotid artery 2 months after the first procedure.

Positive clinical and angiographic results were noted in all cases. No intraoperative or early post-operative complications, such as acute myocardial infarction or ischemic stroke, were seen in this group.

Our experience allows to confirm that simultaneous endovascular elimination of coronary and cerebral arterial stenoses is an effective and relatively safe method for elderly patients.

EFFECTIVENESS OF THE TREATMENT OF CORONARY HEART DISEASE USING PTCA AND STENTING IN PATIENTS OF THE EXTREME AGE CATEGORIES

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Over 30% of patients who underwent PTCA and stenting in the Department of endovascular methods of diagnostics and treatment of the City Multi-Profile Hospital N3 of St. Petersburg, were aged 60 years and more. This was the reason for the objective analysis of the performed percutaneous coronary interventions (PTCA) in patients of this age category and for the evaluation of the feasibility and safety of complete coronary revascularization using coronary angioplasty and stenting methods in elderly and old patients with coronary heart disease.

We analyzed the results of examination and treatment of elderly and old patients aged 70 years and more using PTCA. In order to evaluate the effectiveness these data were compared with the results of treatment of younger patients – up to 40 years. Two groups were formed: control group comprised 136 young patients (mean age 36.4 ± 2.9 years), the group of study comprised 123 elderly and old patients (mean age 73.1 ± 2.1 years). Stable angina of the II and III functional class was present in 85.4% of the study group and in 75% of the control group. The remaining patients underwent myocardial revascularization for acute coronary syndrome (ACS).

PTCA and stenting in patients of the older age group have their particular features related to diffuse atherosclerotic lesion of the arterial bed, which was reflected in immediate results of PTCA. Complete coronary revascularization could be performed in 108 (87.8%) patients, partial revascularization – in 11 (8.9%). The rate of successful recanalization of chronic total occlusion in geriatric group patients was 65%. In control group complete revascularization was performed in 93.4% of patients. It suggests that the probability of success in elderly and old patients is as high as in younger patients.

Thus, we can draw the following conclusions:

1. Age-related particularities in elderly and old patients, manifested in the form of multi-focal atherosclerotic vascular lesions, diffuse changes in the coronary arteries, do not prohibit successful percutaneous endovascular treatment of all clinical forms of coronary heart disease.
2. The volume of the intervention must take into account clinical form of coronary heart disease. Lumen restoration in the symptom-related artery is the method of choice in cases of acute coronary syndrome.
3. In most elderly and old patients with coronary heart disease, despite diffuse character of coronary lesions, complete myocardial revascularization can be achieved by percutaneous coronary intervention.
4. The complications of PTCA in elderly and old patients with coronary heart disease are not related to the presence of associated pathology and their incidence is not higher than in younger patients.

LONG-TERM FOLLOW-UP AFTER PTCA FOR IN-STENT STENOSES

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The procedure of PTCA performed for in-stent stenosis, according to different authors, is associated with good immediate angiographic results, however in the long-term repeated in-stent stenosis develops in a rather big number of cases (17% to 40%).

The purpose of study consisted in the analysis of the long-term clinical and angiographic results of PTCA in patient with different roentgeno-morphological types of in-stent stenoses.

Material of study: from February 1997 till December 2007, 328 patients with previously implanted 442 coronary stents underwent control examination in the long-term follow-up after stenting procedure (mean, 7.0 ± 3.6 months); the presence of in-stent stenosis was confirmed angiographically in 391 stents. As a result, 345 patients with 310 stents underwent PTCA for in-stent restenosis. Depending of roentgeno-morphological type of the stented segment's lesion (as assessed by CAG) all patients were divided into 4 groups: 1) Group 1 – 163 patients (47.2%) with local in-stent stenosis (stent lesion < 10 mm). 2) Group 2 – 79 patients (22.8%) with diffuse in-stent stenosis (stent lesion > 10 mm, in-stent stenosis in the stent (s) lumen, not exceeding the edges). 3) Group 3 – 67 patients (19.5%) with diffuse-proliferative in-stent stenosis (stent lesion > 10 mm, in-stent stenosis exceeding the stent's edges). 4) Group 4 – 36 patients (10.5%) with "total occlusion" of the stent (TIMI 0). Most patients in the groups of study were males, aged > 50 years. The duration of clinical manifestations of CHD in patients from all four groups was over 2 years. Among risk factors for CHD the most common were arterial hypertension, dyslipidemia, smoking; 22% of all patients with revealed in-stent stenosis had a history of MI. Average LV ejection fraction in all groups of study was within normal limits. Clinical and angiographic results of previous endovascular treatment of in-stent restenosis were studied in the long-term (mean – at 8.6 ± 5.4 months) in 150 (43.5%) patients with 177 previously implanted stents. In the long-term after PTCA for in-stent stenosis positive exercise test was seen on the average in 26.9% of cases. Mean tolerance threshold was 76.8 ± 6.8 Wt. In-stent restenosis was most commonly revealed in the proximal segment of the LAD ($p > 0.05$).

Results: in the long-term after endovascular treatment total and cardiac survival of patients from the groups of study was 100%. The majority of patients from the groups of study (60%) were angina-free, clinical course of the disease improved. In patients from groups 1-4 with initially preserved contractile capacity of the left ventricle by the moment of PTCA, control examination did not show significant increase of myocardial contractility ($p > 0.05$). Our

study revealed significant decrease in the need of the main antianginal drugs – nitrates, β - blockers, Ca antagonists – in the long-term after the procedure ($p < 0.05$). Control angiographic study revealed repeated in-stent restenosis in 22.2%, 25%, 14.3%, 25% of cases in Groups 1 -4, respectively ($p = 0.4$). Stent re-occlusion was seen in 8.4% of patients with initial diffuse-proliferative in-stent restenosis and in 14.5% with initial stent occlusion. In most case of repeated in-stent restenosis successful PTCA was performed ($p > 0.05$). In the remaining cases pharmacological therapy was recommended, and in cases of atherosclerotic process progressing – CABG.

Conclusion: the use of PTCA for the treatment of in-stent stenoses is the most available, simple and safe method, in the long-term positive clinical and angiographic effect of endovascular treatment for in-stent stenosis is preserved in the majority of patients.

IMMEDIATE AND MOD-TERM RESULTS OF STENTING OF THE LEFT MAIN CORONARY ARTERY IN PATIENTS WITH DIFFERENT FORMS OF CHD

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In most cases endovascular interventions on the left main coronary artery are of selective character and require meticulous selection of patients. The majority of these patients have acute occlusion of the left main coronary artery (LCA) with clinical manifestation of acute LV failure, cardiogenic shock; also this group include patients at high risk for surgery, including patients after direct revascularization of LV myocardium (CABG surgery).

The purpose of our study consisted in the evaluation of immediate and mid-term clinical and angiographic results of stenting of the LCA.

Material and methods: from June 2002 till May 2007, 42 patients underwent endovascular interventions for the left main stenosis in the Moscow City Center of Interventional Cardioangiology. The majority of them were men ($n = 27$; 64.3%), aged from 43 to 79 years (mean age 60.1 ± 12.1 years). Average CHD duration did not exceed 4.3 years (0 to 324 weeks). As for risk factors, 71.4% of patients ($n = 30$) had dyslipidemia, 85.7% ($n = 36$) – arterial hypertension, 45.3% ($n = 19$) were smokers, 20 (47.6%) had a history of MI, 1 patient (2.4%) had a history of transient cerebral circulatory disturbances, 7 patients (16.7%) had atherosclerosis of brachiocephalic arteries, and 5 (11.9%) – atherosclerosis of the lower extremities. In 52.4% of cases ($n = 22$) the examination was performed for urgent indications. Acute myocardial infarction was revealed in 23.8% of cases. Heart rhythm and conduction disturbances were observed in 9.5% of cases ($n = 4$). Clinical manifestations of acute heart failure were seen in 23.8% of cases ($n = 10$); in 7.1% ($n = 3$) they required intraaortic balloon pumping. Heart failure of func. class II was present in 14.3% ($n = 6$), of func.

class III – in 31% ($n = 13$), unstable angina of func. class II – in 28.6% ($n = 12$) of cases. In-hospital examination revealed mean EF of $52 \pm 4.2\%$. Stress-testing was performed in the absence of contraindications, and was not performed in 25 patients (59.2%). In 88.2% of the remaining cases stress-test results were positive. Mean physical tolerance threshold was 59.5 ± 2.1 Wt. Diagnostic coronary angiography revealed hemodynamically significant stenosis of the LCA in all patients; its degree varied from 60 to 100% (on the average – 79.4%). In 4.8% of cases ($n = 2$) there was an acute occlusion of the LCA. In 2.4% of cases chronic occlusion of the LCA was revealed ($n = 1$). Isolated ostial lesion of the LCA was seen in 35.7% of cases ($n = 15$), bifurcational lesion of the LCA – in 28.6% of cases ($n = 12$), involving major branches of the LCA system – in 18 patients (42.9%). The majority of patients had hemodynamically significant changes in other coronary arteries.

Results: direct stenting of the LCA was performed in 66.7% of cases ($n = 28$), in 2 cases (4.8%) with the LCA occlusion mechanical recanalization and PTCA of the LCA were necessary. In the majority of cases bare metallic stents were implanted into the LCA. We have used the following stents: Multilink Tetra – 3, Penta – 2, BxSonic – 23, R-Stent Evolution – 4, as well as drug-eluting stents Dexamet – 1, Cypher – 4, Taxus – 2, Genius – 1, Driver – 1. In 2.4% of cases ($n = 1$) 2 stents were implanted in the LCA, mean implantation pressure was 12.4 ± 1.6 atm., mean duration of implantation – 19.3 ± 0.7 sec. Mean diameter of the implanted stents was 3.9 ± 0.5 mm with mean length 14.6 ± 1.1 mm. Immediate angiographic results were good in 100% of cases. Endovascular interventions on the LCA were performed without any complications in 100% of cases. In 16.7% simultaneous endovascular interventions on another vessel were performed, including with the use of «debulking» technique. Hospital course was uneventful in 88.1% of cases ($n = 37$), these patients were discharged in stable condition. Hospital mortality was 9.5% ($n = 4$). On the average 6.01 ± 0.6 months after stenting of the LCA 52.4% of patients ($n = 22$) were re-examined. Angina recurrence was revealed on the average 1.2 months after stenting of the LCA. Control examination revealed heart failure of func. class II in 13.6% of patients, unstable angina of func. class II – in 36.4% of patients, two patients had AMI (9.1%), and in 54.6% of patients ($n = 12$) no symptoms were revealed. Clinical manifestations of heart failure were observed in 22.7% of patients ($n = 5$). Control ultrasound investigation of the heart revealed LV EF of 48.6%. An insignificant increase of physical tolerance was noted, on the average it was 75 Wt ($p > 0.05$). The share of positive stress-test results was 33.3% ($n = 3$). Control coronary angiography revealed in-stent restenosis of the LCA in 50% of patients ($n = 11$). Atherosclerosis progressed in 50% ($n = 11$). In 45.5% of cases ($n = 10$) the patients received the recommendations for pharmacological treatment, in 31.8% of cases ($n = 7$) repeated intervention for in-stent stenosis of the LCA was performed, 5 patients

(22.7%) were referred for CABG. Total and coronary survival in the long-term follow-up after stenting of the LCA was 88.9%. Hospital mortality in the long-term follow-up after stenting of the LCA was 9.1% (n=2).

Conclusion: stenting of the LCA in appropriately selected patients gives satisfactory immediate angiographic results in the majority of cases. Such endovascular interventions for stenotic processes in the LCA can be an alternative to surgical CABG in patients with multi-vessel coronary lesions. However in the long-term the effect of endovascular interventions on the LCA is preserved only in 50% of patients, with so-called "silent" restenosis being revealed in the mid-term a quarter of examined patients.

IMPLANTATION OF EXTRACARDIAC NETLIKE FRAME: A NEW SURGICAL TECHNOLOGY IN THE TREATMENT OF HEART FAILURE

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Purpose. The study of clinical effectiveness of isolated (without additional heart surgery) surgical implantation of a netlike frame in the treatment of dilatational cardiomyopathy (DCMP).

Methods. From October 2003 to October 2007 we implanted a netlike frame in 15 patients with DCMP. The patients were aged 43.1 ± 10.8 years (28 to 62 years). Baseline dimensions and volumes of the left ventricle (LV) were: EDD 7.1 ± 0.9 cm, EDV 251.7 ± 80.7 ml, ESV 182.3 ± 73.6 ml; mitral insufficiency (MI) of 1.0 ± 0.5 degree. LV ejection fraction (EF) was $25.2 \pm 6.0\%$. Functional state of patients corresponded to NYHA class 3.7 ± 0.3 .

Results. No hospital deaths occurred. Long-term results were followed for up to 4 years. No episodes of circulatory decompensation and no deaths were seen in the long-term follow-up. The implantation of a netlike frame prevented the progressing of heart dilatation. Three months after surgery we noted a decrease of LV volumes (EDV from 251.7 ± 80.7 ml to 229.0 ± 61.3 ml, ESV from 182.3 ± 73.6 ml to 167.7 ± 46.2 ml) and an improvement of its pumping function (EF increase from $25.2 \pm 6.0\%$ to $27.1 \pm 5.1\%$, CI from 2.0 ± 0.5 ml/min/m² to 2.4 ± 0.7 ml/min/m²). In some cases the dimensions and systolic function of the LV get completely normalized. Functional state of patients improved by 1 NYHA class (from 3.7 ± 0.3 to 2.8 ± 0.6). Actuarial survival during the follow-up period was 100%. The presented volume of clinical observations allows to reveal a positive trend with the use of a netlike frame; at the same time definite conclusions concerning its role will become possible after the continuation of the study.

Conclusions. Isolated implantation of a netlike frame in patients with DCMP prevents the progressing of heart cavities dilatation and contributes to the improvement of their functional state.

ENDOVASCULAR MYOCARDIAL REVASCLARIZATION IN PATIENTS WITH ACUTE CORONARY SYNDROME (ACS) REFRACTORY TO PHARMACOLOGICAL THERAPY

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Introduction: with the use of standard pharmacological therapy in the treatment of patients with unstable angina and myocardial infarction without ST elevation (NSTEMI), with persistent or recurrent anginal pains, episodes of life-threatening arrhythmias, signs of circulatory insufficiency, cumulative values of mortality and AMI recurrence are 2.4% within the first 48 hours and reach 16.3% within 6 months (Topol E.J., 2003). The right choice of treatment strategy can significantly decrease mortality and incidence of major cardiac complications.

Purpose of study: analysis of immediate and long-term results of endovascular treatment of with ACS, refractory to pharmacological therapy.

Material and methods: the study comprised 312 patients with ACS aged from 39 to 82 years (mean, 56.4 ± 5.2 years), predominantly males (76%). All patients underwent endovascular treatment within the first 48 hours after the admission. The urgency of invasive intervention was caused by unstable course of the disease. Diabetes mellitus was present in 46 (14.7%) patients, the history of AMI in 112 (36%), chronic renal failure in 16 (5.2%) patients, multivessel disease and LCA lesion in 90 (29%) patients. Average number of significantly stenotic arteries was 2.12 ± 0.11 . In total 427 endovascular procedures were performed: 259 stents were implanted (success in 98.7% of cases), 168 PTCA procedures were carried out (success in 93.9% of cases). In the long-term, on the average – 7.2 ± 0.9 months after the procedure, control clinical examination including selective CAG and left VG, was carried out.

Results: during in-hospital period mortality in the group was 0.9%, AMI developed in 1.5% of patients, clinical picture of angina was seen in 4.5% of cases (in patients with incomplete coronary revascularization). Control examination performed in the long-term follow-up revealed clinical improvement in 274 (88.1%) patients: clinical picture of angina was absent in 224 (72.2%) patients, 50 (15.9%) patients had clinical signs of angina of 1-2 func. class. Stress-testing was negative in 68.4%. Significant decrease of nitrates intake (from 97% to 34%) was noted. Unstable angina and angina of 3-4 func. class recurred in 27 (8.7%) patients, AMI developed in 9 (2.9%) patients, one patient died (0.3%). Control CAG showed satisfactory results in 76.2% stented segments, restenosis was revealed in 21.5% of cases, the vessel occlusion – in 2.3%. PTCA gave satisfactory long-term results in 69.8% of cases, restenosis developed in 26.3%, occlusion in 3.9% of cases. Repeated revascularization was

carried out in 72 (23%) patients, CABG was recommended in 21 (6.7%) patients.

Conclusion: Urgent endovascular procedures in patients with unstable angina and non-Q-wave AMI, at high risk for cardiac complications, is an effective and rather safe method for clinical stabilization of patients during in-hospital period; this effect is preserved to a considerable degree in the long-term. Higher clinical effectiveness was observed after complete revascularization. Invasive interventions are, probably, the only alternative to direct myocardial revascularization in patients with multivessel disease or the lesion of the left main coronary artery, with severe concomitant pathology.

STATE OF CORONARY CIRCULATION AND CLINICAL COURSE OF CHD IN WOMEN OF REPRODUCTIVE AGE

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Purpose: to study the prevalence of risk factors (RF) related and non related to reproductive system in fertile women, as well as to assess the state of their coronary circulation and clinical course of CHD.

Material and methods: the study comprised 172 women aged from 30 to 50 years. We have studied their main RF for CHD and defined the states of the reproductive system specific for the development of the above pathology. Also we evaluated the state of the coronary circulation (based on selective coronary angiography) and determined plasma levels of sex hormones (estrogen and progesterone). All women were divided into 3 groups: Group 1 comprised 105 patients with CHD with preserved menstrual cycle, Group 2 – 36 patients with CHD in menopause period, Group 3 – 31 practically normal women with preserved menstrual cycle without clinical and ECG signs of CHD. According to selective coronary angiography data, coronary arteries in these women had no stenotic changes and were of normal appearance.

Results: No clear correlation between dyslipidemia rate and atherosclerotic coronary lesions was found in the group of women of reproductive age with CHD. However such risk factors as smoking (70.5%) and arterial hypertension (62%) were far more common. A relation between CHD incidence and burdened gynecological history was found. The first place among gynecological diseases eventually representing risk factors for CHD, went to uterine myoma (23.8%), then went the use of hormonal contraceptives (22.8%) and ovarian insufficiency (resection or removal of one ovary) – 8.6%. The women of the reproductive age with angiographically proved stenotic lesion of the coronary arteries had a significantly decreased plasma estradiol and progesterone level as compared with practically healthy women ($p < 0.01$ vs. $p < 0.001$, respectively). The lowest indices of sex hormones were found in smoking

women with CHD. 34.8% of women with CHD had menstrual cycle disturbances in the form of hypo-estrogenic anovulatory cycles. Coronary angiography performed in reproductive age patients with CHD revealed isolated single-artery coronary lesion in 56.2% of cases, two-vessel lesions – in 20%, and three-vessel lesion – in 23.8% of cases. CHD course in women with menstrual cycles was more favorable than in women in menopause. The course of the disease in these patients aggravated in the presence of repeated MI and was not dependent on the age and CHD duration. It is worth noting that the improvement in the clinical course in most women was related to the performed endovascular procedures.

Conclusion: besides smoking, arterial hypertension and atherogenous dyslipidemia, the development of premature CHD in women is associated with aggravated gynecological history. Reproductive age women with stenotic coronary lesions have significantly lower blood levels of sex hormones. A reverse correlation was found between the degree of coronary lesion and the level of sex hormones.

IN-HOSPITAL OUTCOMES OF THE TREATMENT OF ACUTE MI WITH ST-SEGMENT ELEVATION WITH THE USE OF VARIOUS METHODS OF REPERFUSION THERAPY

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Objective: To assess in-hospital outcomes of the treatment of acute MI (AMI) with ST-segment elevation with the use of various methods of reperfusion therapy.

Materials and methods: From January 2005 till June 2007, 886 patients with acute MI were admitted to our clinic; 622 (70%) out of them were supposed to undergo one of the kinds of reperfusion therapy. These patients were divided into two groups according to primary strategy of AMI reperfusion therapy: systemic coronary thrombolysis (TLT) ($n=217$), and probable primary coronary intervention (Transcatheter Coronary Intervention) ($n=405$). Totally, 568 (64%) patients admitted with AMI underwent coronary angiography within 48 hours after onset of clinical manifestation.

Results: The rate of TIMI 2-3 blood flow through the infarct-related artery (IRA) according to coronary angiography findings was higher in TLT group (65%); in TCI group it was 36%. The “symptom-needle” time was less in TLT group (221 minutes); in TCI group the “symptom-balloon” time was 489 minutes. High efficacy of coronary intervention both primary and after thrombolysis was noted. In-hospital lethality was 2.8% in TLT+TCI group and 2.9% – in TCI group. There were no differences by in-hospital complications.

Conclusion: TLT as the primary strategy of AMI treatment results in faster achievement of reperfu-

sion of the IRA by TIMI >2 criteria, but is less effective than primary TCI. Performing TCI after TLT is safe. There were less perioperative complications in the form of distal embolism and «no-reflow» syndrome in patients with TLT+TCI combination. We consider routine coronary angiography to be reasonable in all patients with ECG-criteria of effective thrombolysis.

RISK FACTORS FOR EDGE RESTENOSIS WITH THE USE OF CYPHER STENTS AND POSSIBILITIES OF THE LIMITATION OF EDGE RESTENOSIS RATE BY CHANGING THE TECHNIQUE OF STENTING

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Purpose. To study risk factors for edge restenoses and possibilities for their rate decrease by the way of changing the technique of stenting.

Material and methods. 236 Cypher stents and 78 bare metallic stents were implanted in 158 patients. Control coronary angiography was carried out in all of them after 11.7 months.

Results. In total we revealed 15 (3.6%) edge restenoses in Cypher stents and 8 (5.7%) – in ordinary stents ($p>0.05$). While the rate of proximal restenoses was equal (2.2% and 2.1%), the rate of distal restenoses with bare stents was higher (1.4% and 3.6%, respectively) ($p=0.13$). Regressive analysis of the relative risk revealed risk factors for edge restenoses development. These factors can be divided into anatomic and procedure-related (related to the stenting technique).

Anatomic risk factors included: a) diffuse coronary lesion. (In cases with diffuse lesion the edges of the stent were positioned in the arterial sites restricted by <50 %); b) arterial diameter <3 mm. Procedure-related risk factors included: a) the difference between the diameters of the stent and the artery in the edge area; b) balloon outlet over the stent's edge. (The cases when the stent did not cover the whole site of pre- or post-dilatation.); c) long (over 20 mm) stent; d) direct stenting

In cases of diffuse lesions met in 2003-2004 the stents' edges were positioned in the stenosis in 76 (37.6%) cases. Control examination performed one year later revealed in 47 (61.8%) cases an increase of the degree of stenosis in the edge area, on the average from $13.5\pm3.9\%$ to $39.3\pm4.6\%$. Ten of these stenoses (13.2%) had binary significance. 126 (62.4%) stents' edges were positioned in the normal area. There was 1 case of hemodynamically significant restenosis (0.8%), which is significantly ($p<0.05$) below the rate of edge restenoses after stents' edges positioning in the stenotic area. Significant correlation dependence of stenosis was revealed after stent implantation in diffuse arterial lesions stent's edge positioning in the stenosis).

The model of logistic regression (logit) revealed that the highest probability of restenoses develop-

ment ($\chi^2=69.14$, $p<0.001$) is awaited after the implantation of stents with the difference in the stents and edge area of the artery diameters over 21%. The rate of edge restenoses with such diameters ratio was not significantly different: in 2003-04 – 15.4%, in 2005 – 12.5%.

Conclusions. The rate of edge restenoses encountered with Cypher stents does not exceed the rate of edge restenoses seen with bare stents (cytostatic effect of the eluted agent on the edge neoendothelialization is not sufficient for the increase of edge restenoses rate with Cypher stents). Diffuse coronary lesion is an independent risk factor for edge restenoses with Cypher stents. Arterial diameter <3 mm, stent/arterial edge diameters ratio >21%, «balloon outlet over the stent's edge», use of long (over 20 mm) stents, direct stenting are risk factors only with stenting of diffusely damaged arteries. The changes in stenting technique allow to decrease the rate of edge restenoses to <1.0%.

COMPARATIVE EVALUATION OF THE EFFECTIVENESS AND SAFETY OF CLINICAL USE OF SIROLIMUS- AND PACLITAXEL-ELUTING STENTS

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Purpose of study: to perform comparative evaluation of the effectiveness and safety of the use of sirolimus- and paclitaxel-eluting stents in our clinical practice.

Material and methods: the study comprised 157 patients in whom 212 sirolimus- and paclitaxel-eluting stents were implanted during the period from September 2005 till November 2007. 84 patients received 118 Cypher stents, 73 patients – 94 Hercules stents. All patients had clinically confirmed manifestations of myocardial ischemia. A maximum of two stents was implanted in de-novo stenoses in different coronary arteries. Stenoses >50% were considered as hemodynamically significant. The calculations were performed with the use of a software for stenoses calculation of Siemens – Axiom angiographic system. We used to stent the stenoses in the vessels measuring 2.25 to 4.25 mm, with the length from 10 to 35 mm.

The end-points of the study were: angiographic – Late Loss in stent segment and the degree of restenosis (in %); clinical – ischemic complications related to the stented segments and occurring within 360 days.

Results: within 360 days the Late Loss in stent segment in the group of patients with sirolimus-eluting stents was 0.15 ± 0.30 mm, mm, in the group of patients with paclitaxel-eluting stents – 0.35 ± 1.5 mm; restenosis degree was 2.1% and 12.3%, respectively. In the group of patients with paclitaxel-eluting stents with the diameter <2.5 mm the results were

significantly worse – restenosis degree 25.4%. The rate of clinical ischemic complications was 1.8% in sirolimus group and 9.8% in paclitaxel group (including 1 death).

Conclusions: our study revealed satisfactory angiographic and clinical results in both groups, while the results in patients with sirolimus-eluting stents were better.

OUR EXPERIENCE WITH CHEMOINFUSION AND CHEMOEMBOLIZATION OF THE HEPATIC ARTERY IN METASTATIC LIVER INJURY

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Today in Burdenko State Military Clinical Hospital we use chemoinfusion (CIHA) and chemoembolization (CEHA) of the hepatic artery for non-resectable liver injuries. These methods allow to create high concentration of the administered agent within the limited anatomical area and to decrease toxic effect of this agent.

Purpose of study. Evaluation of the effectiveness and safety of CIHA and CEHA in patients with hepatocellular cancer (HCC) and metastatic liver injury (MLI).

Material and methods. From January 2004 till August 2007, CIHA and CEHA were performed in our clinic in 20 patients with HCC and MLI (11 women and 9 men aged 32 to 78 years). Among them 5 patients underwent CEHA, 13 – CIHA (in 4 of them – 3 courses, in 6 – 2 courses and in 3 – 1 course). In two patients one course of CIHA with subsequent CEHA was carried out. In total 15 patients underwent 20 courses of CIHA. The main indication for CIHA is the treatment of histologically confirmed non-resectable HCC or MLI. CIHA was performed for HCC in 2 patients, for MLI in the presence of colorectal cancer – in 3, of gastric cancer – in 2, of ovarian cancer – in 1, of lung cancer – in 1. CEHA was performed for HCC in 1 patient, for MLI in the presence of colorectal cancer – in 2. CIHA with subsequent CEHA was performed in 2 patients for MLI (colorectal cancer in 1, pancreas cancer – in 1). CIHA was done with 5-fluorouracil, leukovarin, mitomycin, platinum preparations, vincristin. Lipiodol was used for CEHA. The dose for one course of infusion was the same or greater than for intravenous administration, with this the manifestations of systemic toxicity were less pronounced. During the whole period of infusion the patient remained in the hospital, in case of abdominal pains or other acute symptoms development the infusion was stopped until the detection of their causes; arterial pulsation on the lower limbs was monitored; control blood and hepatic samples were taken at least once every 2 days.

In two patients segmental CEHA combined with lobar CIHA was used, which allowed to decrease the manifestations of postembolization syndrome.

Results: No deaths occurred. Postembolization syndrome developed postoperatively in patients after CEHA.

Conclusions: CUHA and CEHA are minimally invasive methods of treatment and can be used for combined treatment of non-resectable liver neoplasms along with systemic chemotherapy and local interventions in the tumor. This method can be recommended in patients with non-resectable neoplasms, in whom traditional surgical intervention is technically impossible, or intolerable.

INFLUENCE OF THE PHENOTYPE OF ACETYL-TRANSFERASE ACTIVITY ON THE DEVELOPMENT OF IN-STENT STENOSIS IN PATIENTS WITH CHRONIC CORONARY HEART DISEASE AFTER CORONARY STENTING

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Purpose of study: evaluation of the influence of N-acetylation phenotype on mid-term results of coronary stenting in patients with chronic coronary heart disease.

Material and methods: the study comprised 100 male patients aged 56.8 ± 6.1 years, who received 116 coronary matrix bare metallic stents BX Sonic (Cordis, Johnson & Johnson, USA) for chronic CHD from December 2003 to January 2007. The patients were included to the study after control coronary angiography performed 7.2 ± 2.2 months after endovascular procedure. The main criterion of patients' selection was the presence of in-stent stenosis (Group 1, $n=50$) and good long-term result (Group 2, control, $n=50$) in the absence of known clinical-angiographic risk factors for restenosis development. Baseline angiographic data and immediate result of the procedure were assessed by two independent specialists. Angiographic morphometric indices were processed using the computer of Axiom Artis FC (Siemens, Germany) angiographic machine. The determination of N-acetylation phenotype was performed on the base of the Laboratory of Biocatalysis and Biotransformation of the Belozersky Research Institute of Physico-Chemical Biology (Moscow State University) headed by Professor V.K. Shviadas. Standard agent Sulfadimine was used as a test-agent. After single peroral intake of 500 mg of Sulfadimine, urine was collected for 6 hours. Using the method of high performance effective liquid chromatography (HPLC), the ratio of prometabolized (N-acetyl-Sulfadimine) and non-metabolized Sulfadimine in urine was determined.

Statistical processing of the material was performed using software SPSS 10.0 for Windows.

Results: among the studied patients, slow acetylators (SA) were in 42%, and prompt (PA) – in 58%.

The analysis of acetylation phenotype distribution among the patients of groups 1 and 2 revealed highly significant prevalence of prompt acetylators among patients with in-stent stenosis, $P=0.0006$.

Conclusions: we revealed a highly significant relation of prompt acetylation phenotype with in-stent stenosis development after coronary stenting with bare metallic stents.

COMPARATIVE ASSESSMENT OF HOSPITAL MORTALITY IN PATIENTS AFTER ENDOVASCULAR TREATMENT IN THE ACUTE STAGE OF MI AND AFTER CONSERVATIVE TREATMENT ONLY (WITHOUT PTCA)

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Purpose. The study of hospital mortality and clinical course of the disease in patients with AMI depending on the presence or absence of endovascular interventions.

Material and methods. We have studied 2020 patients with AMI treated in the MCCIC from October 2003 to October 2006. Mean age of patients was 58 ± 23 years. The majority of patients were men – 1676 (83%). Group 1 comprised 1727 (85.5%) patients who underwent 1917 endovascular procedures (EVP) at different stage of AMI: 1085 (56.6%) PTCA procedures and 832 (43.4%) – stenting procedures. Among them 1410 (69.8%) patients had their procedure performed within the first 24 hours from the onset of the anginal attack – 1A subgroup; in 317 (15.7%) patients endovascular treatment was delayed by 24 hours – 21 days – 1B subgroup. The indications for EVP in these patients were early postinfarction angina or positive stress-test. Group 2 (control) comprised 293 (14.5%) patients in whom only conservative treatment was carried out (without PTCA): 2A subgroup – 72 (3.56%) patients admitted within the first 24 hours from the pain syndrome onset, 2B subgroup – 221 (10.94%) patients admitted later than 24 hours after the onset of the anginal attack. The patients in whom ECP was not performed because of the severity of their state at the moment of admission (patients with cardiogenic shock), as well as the patients with severe coronary lesions revealed during CAG, who were subsequently referred for CABG. The baseline clinical and historical data were not significantly different between the groups.

Results. During in-hospital period 64 out of 2020 patients with AMI (3.17%) died; the death was heart-related in 50 cases (2.48%). In the remaining 14 cases (0.69%) the death was caused by gastrointestinal bleeding (5 cases – 0, 25%) and PATE (9 cases – 0.45%). Cardiac mortality in Group 1 was 1.04% (18 cases), that is, significantly lower than in Group 2 – 32 cases, 10.92% ($p < 0.05$). The analysis of deaths among patients admitted within the first 24 hours after the onset of the disease revealed significant decrease of mortality in patients of the 1A subgroup – 15 cases (1.06%) vs. 24 (33.3%) in patients who underwent conservative treatment only ($p < 0.001$). The analysis of mortality in 1B and 2B subgroups also revealed predominantly positive

results in patients after endovascular treatment: 3 (0.95%) vs. 8 (3, 62%) cases, respectively ($p < 0.05$).

Correlation analysis revealed reliable relation of death with absence of PTCA in AMI patients, with non-preservation of good results of EVP, with late recanalization in cases of endovascular treatment, as well as with low LVEF ($< 40\%$), arterial hypotension (< 100 mm Hg.), tachycardia (> 100 beats/min.), CPhK level (1000 U), three-vessel coronary disease and diabetes mellitus.

Conclusions. Performance of EVP in AMI patients, early (within 24 hours) as well as late (24 hours – 21 days), allows to significantly decrease hospital mortality from heart-related causes. Maximal decrease of mortality is seen with maximally early EVP (within the first 24 hours after the onset of the disease).

PECULIARITIES OF THE BRAIN CIRCULATION AND MICROCIRCULATION RESTORATION IN PATIENTS WITH ALZHEIMER'S DISEASE IN IMMEDIATE AND LONG-TERM PERIOD FOLLOWING TRANSLUMINAL LASER ANGIOPLASTY

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Purpose: the study of the peculiarities of the brain circulation and microcirculation restoration in patients with Alzheimer's disease, in immediate and long-term (2-5 years) period following transluminal laser angioplasty.

Alzheimer's disease is widespread in the leading countries worldwide. According to the recent data, this disease holds 3rd place after CHD and oncological diseases in USA. By the year 2006 about 4-4.5 million Americans suffered this ailment. This disease is registered in 10% of USA population in the age of 65, and in 50% – in people over 85 years of age. The mortality of this disease is rather high and reaches 300-400 thousand per year.

In spite of such disease prevalence, there were very few trials in medical practice worldwide directed on the study of brain circulation and microcirculation peculiarities in given group of patients and their correlation with structural changes in the brain. Earlier in our studies we mentioned that in Alzheimer's disease, almost in 100% of cases, the specific changes of distal circulation and microcirculation are seen, which we called "Alzheimer-type circulatory encephalopathy". These changes manifest as major looping in the distal portions of the anterior and middle cerebral arteries, reduction of capillary bed with the development of extensive hypovascularization zones in fronto-parietal and temporal areas which are accompanied by early arteriovenous shunts. At the same time, the patients were revealed to have pathologic changes of the vein branches, which contribute to venous congestion in corresponding vascular territories. The patients had a disturbance linear indices of cerebral blood flow velocity and

pulse volume. The presence of these vascular disorders permits to draw a rather clear correlation with characteristic atrophic changes of the cerebral matter in respective areas.

Methods: 43 patients with various forms of memory disorders from 34 to 80 years of age (mean age was 65) who were previously diagnosed with Alzheimer's disease were examined, and 40 patients underwent surgery. The examination included: CT or MRI, scintigraphy, rheoencephalography (REG), multi-gated angiography (MUGA) scan of the brain.

Transluminal laser angiography was performed within 1-12 years following the first manifestations of the disease. In the long-term postoperative follow-up the brain CT or MRI as well as scintigraphy and REG were performed in all patients 6 months apart; delayed cerebral angiography was performed in 4 patients in 2-4 years after surgery.

Results of the study: Following transluminal laser angioplasty of the anterior and middle cerebral arteries the restoration of capillary supply, which was accompanied by the reduction of arteriovenous shunts, was observed in all of 40 patients. Normalization of venous circulation was observed in 38 patients (95%). Partial normalization of venous circulation was observed in 2 (5%) patients. Improvement of linear indices of cerebral blood flow velocity and pulse volume was seen in 39 (97.5%) patients. A favorable clinical changes over time defined by memory and intellect improvement, reduction of cognitive disorder was noted in all of 40 patients.

In long-term postoperative follow-up, already in 6 months after surgery, all patients had CT signs of narrowing of subarachnoid cavity, convexital sulci and lateral ventricles. The enlargement of the volume of temporal lobes amounted up to 8-12%. The process of brain tissue reparation went on growing better in further examinations, and in 2-3 years after the treatment the dimensions of temporal lobes reached age-specific norm in 32 patients (80%). Repeated angiographic examinations showed preservation of collateral revascularization of the brain, normal capillary circulation and reduction of arteriovenous shunts in all of 4 patients. In one case, in 4 years after the treatment, the 60-years-old patient developed subtotal atherosclerotic stenosis of the proximal part of the anterior cerebral artery trunk, which was treated by repeated transluminal laser angioplasty. In another case, worsening of cognitive disorder accompanied by CT signs of partial increase in brain tissue atrophy was observed in 77-years-old female patient with severe form of Alzheimer's disease and more than 14 years of disease history in 2 years after the surgery.

Good clinical result – almost complete memory and intellect restoration was seen in 17 (42.5%) patients, satisfactory clinical result – incomplete memory and intellect restoration – in 13 (32.5%) patients, relatively satisfactory clinical result – partial memory and intellect restoration was seen in 10 (25%) patients.

Acquired data suggest that transluminal laser angioplasty performed at different stages of Alzheimer's disease provides consistent and continuous effect which is defined as:

1. Restoration of distal cerebral circulation and microcirculation, i.e. elimination of signs of the Alzheimer-type circulatory encephalopathy.
2. Decrease in brain tissue atrophy and tissue structure restoration.
3. Reduction of symptoms of the disease and restoration of memory, intellect as well as of patients' quality of life.

In the treatment of patients in advanced stages of the disease the recurrence is possible in long-term follow-up, which is obviously related to previously occurred changes in the brain tissue.

OUR EXPERIENCE WITH ENDOVASCULAR TREATMENT FOR CHRONIC CORONARY ARTERY OCCLUSIONS IN PATIENTS WITH CORONARY HEART DISEASE (CHD)

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Objectives: To evaluate the effectiveness of PTCA and stenting in chronic coronary artery occlusions as independent option of CHD surgery.

Material and methods: This study included 46 CHD patients who underwent a successful guide-wire recanalization for chronic total coronary artery occlusion with subsequent angioplasty. There were 44 men and 2 women aged from 31 to 68 (on the average 47) years, among operated patients. Thirty three patients had various concomitant diseases, 29 (63%) patients had a history of 1-2 myocardial infarctions, 2 (4.3%) patients had recurrent angina after coronary artery bypass grafting (CABG). Multifocal atherosclerotic lesion was observed in 5 (10.8%) cases. Disease duration ranged from 1 to 9 years. Presumed duration of occlusion ranged from 3 months to 7 years. Fourteen patients had exertional angina functional class (FC) II (according to Canadian Cardiologists Society (CCS) classification), 18 had FC III, 12 had FC IV, 2 patients had unstable angina I B FC (Braunwald). Single-vessel lesion was present in 15 cases, multi-vessel lesion (lesion of more than 1 coronary artery) – in 31 cases, multiple lesions – in 19 cases. Attempts of angioplasty and subsequent recanalization were undertaken in the presence of hibernated myocardium in the vascular territory of occluded coronary artery. The majority of PTCA were performed on the LAD – 21, the RCA – 15, the Cx – 10. Stenting was performed in the LAD – in 18 cases, the RCA – in 15, the Cx – in 6 cases. The remaining 7 patients underwent only the routine balloon angioplasty.

Results: PTCA was considered angiographically successful when it resulted in restoration of the lumen of operated artery segment taking into

account the residual stenosis not exceeding 25% and TIMI III blood flow through this segment. Clinical success was assessed by changes of CHD clinical manifestations (decrease of angina FC by 1-2 levels) over time or their absence. Immediate angiographic success was achieved in all 46 patients, clinical success – in 44 (95.7%) patients. Long-term results were followed up from 3 months to 4 years (with control angiography) in 41 (89%) patients. Clinical improvement was preserved in 27 (65.9%) patients: in 25 (60.9%) patients with implanted stent and only in 2 (5%) patients after PTCA. In 9 (25.7%) out of 35 patients who underwent stenting the restenosis was revealed, in one (2.86%) case – reocclusion of the operated artery segment. In the group of PTCA the rate of restenosis and reocclusion was 33.3% and 33.3%, respectively.

Conclusion: Endovascular recanalization with subsequent angioplasty of the occluded coronary artery is effective, minimally invasive and relatively safe method of CHD surgery. Implantation of intracoronary stent at the final stage of the procedure provides substantial improvement of immediate and long-term results of the intervention.

ENDOVASCULAR HEMOSTASIS IN LUNG CANCER

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Purpose of the study. To demonstrate the potential of angiography in the diagnostics of lung malignancies and endovascular hemostasis of pulmonary hemorrhage (PH) caused by this disease.

Material and methods. We present our experience with endovascular treatment of pulmonary hemorrhage caused by malignant tumor of the lungs in 70 patients (52 males and 18 females) performed in the period from September 1994 till February 2007. Mean age was 55 years. Right-sided lesion was revealed in 50 patients, left-sided – in 17 patients. Bilateral process was diagnosed in 3 patients. PH severity grading was done in accordance with the classification of E.G. Grigoriev. The most frequent diagnosis was 1a and 1b PH, less frequently – 1c and 2a grade. No grade 2b and 3 PH were seen. Endovascular intervention was in all cases preceded by diagnostic bronchoscopy which aimed at the determination of the hemoptysis localization with subsequent isolation of hemorrhage zone with polyurethane obturator. All patients in the X-ray operating room after bronchial arteriography (BAG) underwent final PH hemostasis by means of X-ray-endovascular occlusion of bronchial arteries (EOBA) which had specific signs of malignant lesion in their territory or else the signs of ongoing hemorrhage. Polyurethane emboli of various sizes were

used as embolization agent. X-ray-endovascular occlusion of changed segmental branches of the pulmonary artery with Gianturco coil was performed in 5 cases. Obturators were removed from the bronchial tree on day 3-4. Three patients who underwent BAG and EOBA experienced recurrent PH on the day 3 after the bronchial obturators removal. One out of them died of asphyctic PH at the moment of bronchial occluder removal. Two patients were operated in the thoracic operating room in the immediate period.

Conclusions. Bronchial arteriography allows for lung cancer detection or confirmation. Endovascular occlusion of bronchial arteries in PH due to lung cancer allows to perform effective hemostasis and to gain time for stabilizing the patient for elective surgery.

MULTIVASCULAR ANGIOPLASTY AND CORONARY BYPASS SURGERY: COMPARISON OF IMMEDIATE AND LONG-TERM OUTCOMES

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Transluminal coronary angioplasty (PTCA) and coronary bypass surgery (CABG) are alternative options for myocardium revascularization in patients with coronary heart disease.

The purpose of this study is the comparison of clinical efficacy and long-term outcomes of angioplasty and coronary bypass surgery in patients with CHD associated with multivessel lesions of coronary arteries.

Material and methods. From 1998 to 2007, 543 patients with the lesions of two or more coronary arteries aged from 40 to 74 years (55 ± 9) who successfully underwent transluminal coronary angioplasty or coronary bypass surgery were examined within this open-label non-randomized retrospective study. PTCA was performed in 279 patients, CABG – in 264 patients. The following clinical factors were used for the assessment of immediate effectiveness of the treatment and its long-term outcome: presence or absence of angina symptoms, repeated myocardial revascularization (angioplasty or coronary bypass surgery), changes in physical tolerance (judged by stress-test data), myocardial infarction, death.

Results. Mean observation period was 6.1 ± 0.8 years. In-hospital stay duration was 14 ± 8 days in patients who underwent PTCA and 24 ± 10 days in patients who underwent CABG. During in-hospital period 1 lethal case was reported in the group of CABG; there were no lethal outcomes in PTCA group. Persistence of angina symptoms was more often reported in PTCA group (13%) as compared to CABG group (9%); repeated revascularization was required in 3.2% of cases after PTCA and in 0.7% after CABG. Greater increase of physical tolerance was seen in patients of PTCA group (81 ± 22

Watts) as compared to CABG group patients (65±18 Watts). Myocardial infarction developed in 9 (3.2%) patients in the PTCA group (3 – with Q-wave) and in 3 (1.1%) patients in the CABG group (1 – with Q-wave) (no data). Cumulative rate of in-hospital complications was insignificantly higher in the PTCA group (16% and 11%, respectively) After 6 month follow-up, cumulative rate of complications of PTCA and CABG was 41% and 24%, respectively ($p<0.05$). At the end of follow-up (6.1 years) the survival rate and absence of evident cardiac complications were 44% in the PTCA group and 56% in the CABG group (no data). Angina functional class following intervention significantly decreased in 3 months as compared with preoperative findings. These changes over time were seen thought the observation period with minimal values being achieved in 6 months in the PTCA group and in a year – in the CABG group; by the end of observation period the difference was not significant.

Conclusions. Our findings suggest that the immediate and long-term results of coronary angioplasty in CHD patients with multivessel coronary artery lesions are comparable to those of coronary bypass surgery when modern intervention techniques are used.

CONCEPTION OF VASCULAR INSUFFICIENCY

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Relevance: Today physicians of many specialties are engaged in treatment of vascular insufficiency (VI) – cardiovascular surgeons, angiologists, cardiologists, neurologists, specialists in rehabilitation, abdominal surgeons, pulmonologists, etc. Each specialty has so strictly specialized terminology and specificity, that the specialists in a literal sense “speak on different languages” about the same pathology. Clinical conception of ischemia or its “images” in the each narrow specialty differ from conceptions determined by fundamental sciences and, certainly, from conceptions of ischemia in allied particular specialties. Differences exist both in terminology and in classification of severity of ischemia. Cardiologists changed term **necrosis** (in Greek “nekros” – local death) previously known in pathology to infarction (in Latin “infarctus” – stuffed, filled), and neurologists – to insult (in Latin “insultare” – to skip, to jump). In abdominal surgery chronic intestinal ischemia is called “abdominal ischemia” or “abdominal angina”, and acute ischemia – gangrene (in Greek “gangraina – mortification of organ or body part) or intestinal necrosis. There are no underlying fundamental principles of ischemia classification, both acute and chronic. Acute coronary syndrome and cerebrovascular insufficiency now are wide spread terms in cardiology and neurology just as “acute abdomen” in surgery at one time. But are these terms medical today? These terms like the previous ones are TERMS-MEDIATORS. During

reversible stages of ischemia, but not infarction, insult and gangrene, it is possible and necessary to prevent irreversible changes. After all, cardiovascular surgeons treat and cure acute ischemia, but not GANGRENE of extremity! Today we have minimal theoretical ideas about acute and chronic venous insufficiency (AVI and CVI) of the myocardium, brain, intestine, liver, pancreas, lungs, etc, and we do not use these conditions as diagnoses in medical practice. But is this because patients did not have them? This is because either we **do not know** them or we **have not approved definitions and appropriate classification** in order to officially register them in the medical record. Diagnoses of the same diseases have different structures in different specialties that also does not contribute to understanding between specialists of different areas.

Means and methods of treatment are not classified with regard to etiology, pathogenesis and symptomatology of the disease, which they are directed to treat.

Purpose of the study: Systematization of vascular insufficiency on the basis of common general principles of its pathogenesis, which will allow developing classification of vascular insufficiency for the each organ or part of the body.

Discussion: We have systematized all existing classifications of VI on the basis of general mechanism of its development in all organs and parts of the body. **Organ** and **temporal** principles form the basis of the system. As a result, we have received **classification system for VI in different organs and parts of the body** based on **common principles**. A principle of **reversibility** form the basis of **acute** VI classification. Viability of main tissue determines viability of the organ or part of the body in general. For the classification of **chronic** arterial and venous insufficiency we offer to specify I stage – preclinical, II stage – functional disorder (with sub-stages), III stage – borderline or critical (in rest) and IV stage – damage of structure. Such division by stages already has been used for the classification of brain and intestinal ischemia (A.V. Pokrovsky, 1978, L.V. Potashev, 1985). If the system is represented as a table like D.I. Mendeleev’s table, then one will obtain classification system. We offer the common structure of diagnosis, which would be able to reflect different pathologies. Also we offer examples of classification for methods of surgical treatment of VI of extremities.

EXPERIENCE WITH ENDOVASCULAR TREATMENT OF VISCERAL ARTERIAL ANEURYSMS

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Purpose of study: to present the results of endovascular treatment of visceral arterial aneurysms in the Regional Clinical Hospital of Khanty-Mansisk.

Material and methods. Over a 6-years period (2002-2007) of the work of endovascular service in the Regional Clinical Hospital of Khanty-Mansisk we had 4 patients with aneurysms of the splenic artery and 1 patient with aneurysm of the superior mesenteric artery. All these patients underwent endovascular treatment.

Results. Four patients had different symptoms: abdominal pains, nausea, bleedings. In 3 cases aneurysms' development could be related to previous pancreatitis or pancreonecrosis. In 2 cases the etiology of aneurysms was unclear. The diagnosis was established with contrast-enhanced CT and angiography. In 3 cases in order to precise anatomical features of the aneurysms we have used angiography with 3D reconstruction. In total 6 aneurysms measuring 8 to 67 mm were revealed. In all cases endovascular procedure has been suggested as the first stage of treatment. In 3 patients with splenic artery aneurysms, after the non-effective first stage it was not planned to perform vascular reconstruction, but just splenectomy with partial pancreas resection. In 2 patients the splenic artery aneurysms were excluded from circulation by the way of self-deploying or balloon-deployable stent-grafts; the same was done in 1 patient with superior mesenteric artery aneurysm. In 2 patients the splenic artery aneurysms were closed by proximal embolization with coils through microcatheter lumen, which led to spleen infarctions. The interventions were performed through femoral approach in 4 patients and through brachial approach in a patient with superior mesenteric artery aneurysm. In order to prove aneurysms' thrombosis, contrast-enhanced CT and Dopplerography were performed after the procedure. None of our patients needed additional surgical treatment of their aneurysms. Two patients with splenic infarctions underwent additional conservative treatment with good results.

Conclusions. Endografting and embolization are effective methods for the treatment of visceral arterial aneurysms. Endovascular treatment was used in 100% of cases observed in our hospital. It could be possible to preserve spleen in all patients with splenic artery aneurysms.

RESULTS WITH SIX-YEARS EXPERIENCE WITH ENDOVASCULAR INTERVENTIONS ON THE LOWER LIMBS ARTERIES

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(Khanty-Mansisk)

Purpose of study: to analyze the results of angioplasty in patients with obliterating atherosclerosis of the lower limbs, obtained during all the period of the work of endovascular service in the Regional Clinical Hospital of Khanty-Mansisk.

Material and methods. During 6 years (2002 – 2007) of the work of endovascular service in the Regional Clinical Hospital of Khanty-Mansisk we

have performed 207 interventions in 159 patients with obliterating arterial atherosclerosis in 210 lower limbs, with IIb degree to critical ischemia. These interventions represented 61.4% of all procedures on peripheral arteries. The interventions concerned 275 arteries: 139 iliac (23% of them occluded), 93 superficial femoral (64.5% occluded), 4 infrarenal segments of the aorta (75% occluded), 35 other arteries (popliteal, tibial, common and deep femoral, grafts).

Results. Angiographic success was achieved in 91.4% of iliac angioplasties. Stenting was performed in 91.4%. Recanalization of iliac arterial occlusions was achieved in 93.8% of cases. Contralateral approach was used in 33.8%, retrograde – in 42.4%, through both femoral arteries – in 15.1%, through upper limbs arteries – in 8.6%. Angiographic success of angioplasty of superficial femoral arteries was achieved in 89.2% of cases. Stenting was used in 55.9%. The success of occluded arteries obliteration was 95%. Contralateral and femoral approach on the side of lesion were used equally. Popliteal, brachial and radial approaches were used once each for the angioplasty of superficial femoral arteries.

Complications: acute and subacute thromboses – 1.9% of all interventions, 3 legs were amputated in early postoperative period (1.4% of all operated legs), complications in the access site requiring surgical correction in 2 cases – 0.97%.

Before revascularization all patients underwent angiography. During the last year the passage from diagnostic to therapeutic stage was applied if possible. The amount of complications did not increase, the advantages are obvious. Ischemia severity, the length of the lesion, the state of the distal arterial segments are not independent barriers while determining the indications. In cases when recanalization using standard technique was impossible, we used radiofrequency or laser ablation. We try to treat all accessible lesions on the lower limbs' arteries simultaneously. In 7 cases it was achieved with the technique of introducer sweep inside the femoral artery. In 5.8% of cases simultaneous angioplasties of coronary, brachiocephalic, renal arteries were performed. During the last year perclose was routinely used for hemostasis. As a rule all patients were discharged 2-3 days after the intervention with the recommendations concerning conservative therapy (thienopyridines for at least 6 months). If necessary, patients are re-admitted for angiography and revascularization. The rate of repeated angioplasties of the iliac arteries – 4.3%, of superficial femoral arteries – 20.4%.

Conclusions: angioplasty of lower limbs arteries with IIb-IV ischemia is a procedure accompanied with high rate of technical success even in the presence of occlusion lesion, with low complications rate; endovascular technique allows for simultaneous correction of multistory lesions, bilateral lesions, lesions of the arteries from different pools.

"CLEAR" CORONARY ARTERIES IN PATIENTS WITH ACUTE CORONARY SYNDROME

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Purpose: Retrospective analysis of results of coronary angiography (CAG) in patients with acute coronary syndrome (ACS).

Material and methods: Over a period from year 2006 till year 2007 (10 months) 823 percutaneous coronary interventions (PCI) were performed at the Department of Endovascular Diagnostics and Treatment. PCIs were performed on the occasion of ACS. Mean age of patients included into the study was 61.8 ± 9.5 years (63% of subjects were males and 37% – females). CAG was performed according to standard Judkins method. The studies were performed using angiography equipment Coroscop and Innova-4000, Siemens.

Results: In 199 cases out of all performed invasive interventions (24.2%), procedures were finished after CAG. Afterwards patients were divided in 3 groups in order to clarify reasons for refusal from invasive therapeutic approach in this category of patients: group 1 ($n=58$) – patients with elevation of ST segment (Q-wave MI), group 2 ($n=98$) – patients without elevation of ST segment (non-Q-wave MI), and group 3 ($n=43$) – patients with unstable angina (UA). According to the CAG results the following reasons for refusal from PCI were specified: A – patients without atherosclerotic lesions of CA, B – patients with hemodynamically insignificant lesions, and C – patients for whom revascularization is impossible and/or who have indications for open surgery only.

Table 1

Группы	Q-MI (n=58)	Non-Q-MI (n=98)	UA (n=43)	F	p
A	0	35 (36%)	10 (23%)	2.11	Ns
B	10 (17%)	29 (30%)	10 (23%)	3.14	Ns
C	48 (83%)	34 (34%)	23 (54%)	2.63	Ns

Analysis of the results presented in Table 1 showed that the reason for refusal from PCI in the group of patients with Q-MI in most cases consisted in diffuse lesions of coronary vessels with high risk for intervention (83%) and, to a lesser extent, in hemodynamically insignificant CA lesions (17%). However, in two other groups a total number of patients with absence (59%) or insignificant CA lesions (53%) was much greater. On the one hand, coronary insufficiency in this category of patients could be caused by coronary artery spasm or acute occlusion with subsequent spontaneous thrombolysis, but on the other hand, it could be hyperdiagnostics of ACS. There is another open question concerning the presented problem – the tortuosity of coronary vessels and parietal standing of contrast that apparently requires further investigation.

Conclusion: Thus, according to our data, selection of early invasive strategy for the treatment of patients with ACS in more than 25% of cases results in refusal from PCI. It is possible that in order to reduce number of such cases it is necessary to follow more conservative therapeutic approach that is attractive from the viewpoint of reduction of expenses and risk.

TREATMENT OF HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY USING TRANSCATHETER ALCOHOL REDUCTION OF THE MYOCARDIUM

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Purpose of study: to evaluate the effectiveness of alcohol reduction of the myocardium in patients with hypertrophic obstructive cardiomyopathy (HOCM).

Material and methods: the study comprised 31 patients with hypertrophic obstructive cardiomyopathy. Their mean age was 43 ± 7 years. There were 23 (74.1%) men and 8 (25.8%) women.

The thickness of the ventricular septum (VS), as assessed by ultrasonic investigation, was 2.3 ± 0.3 cm, ejection fraction (EF) $78.3 \pm 4.9\%$, pressure gradient 77.3 ± 14.8 mm Hg.

According to the data of direct tensiometry, pressure gradient was 81.4 ± 7 mm Hg.

During the procedure 1 to 4 ml of absolute alcohol was administered into one or several septal branches through two-lumen balloon catheter of small diameter (1.5–3.0 mm). Intraoperative pressure gradient at the level of left ventricular outflow tract, determined by direct tensiometry, was 11 ± 7 mm Hg.

Results: one day after the procedure VS thickness was 2.5 ± 0.3 cm, the EF – $75.8 \pm 4.9\%$, the pressure gradient – 50.4 ± 4.5 mm Hg. After 6 months VS thickness, as assessed by ultrasonic investigation, was, 1.8 ± 0.2 cm, the EF – $65.0 \pm 4.0\%$ the pressure gradient – 20.5 ± 3.6 mm Hg.

During the procedure scar changes on the ECG and stable transversal block did not develop in any case. We have noted the increase of enzyme and troponine levels, the appearance of fibrotic areas with the decrease of the thickness and in the absence of local VS contractility disturbances.

Conclusions: alcohol reduction of the myocardium in HOCM is a safe and effective method of treatment. One has to take into account the dynamics of systolic pressure gradient LV-Ao typical for this procedure.

EXPERIENCE WITH RETROGRADE RECANALIZATION OF CHRONIC OCCLUSION OF THE RIGHT CORONARY ARTERY

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During the last years transcatheter technologies allowed for great progress in the treatment of patients with CHD. The newest achievements in the field of coronary stents made the long procedure extremely safe and predictable, the rate of restenosis in most patients is below 10%, the number of restenoses and acute thromboses decreased significantly in comparison with previously used isolated balloon angioplasty. Meanwhile it is necessary to note that there are still a lot of problems to be solved. One of them is the problem of recanalization of chronic occlusions.

The attempt of recanalization of a revealed chronic occlusion of a coronary artery is done in 8% -15% of cases. We are aware of the advantages of chronic occlusion recanalization: the improvement of LV pumping function, the decrease of the level of pre-disposition to ventricular arrhythmias, the increase of tolerance to the ischemia produced by contralateral coronary occlusion; with this chronic coronary occlusion is the most widespread cause for patient referral to CABG. In the USA the recanalization of chronic occlusion is done in 20% of the total number of PTCA, that is in about 50.000-100.000 patients every year. At present there are a lot of devices allowing to perform the recanalization of an occluded coronary artery. However we would like to present our experience with the use of a method which does not require special technical appliances.

From April 2007 we performed retrograde recanalization of an occluded segment of a coronary artery in 7 patients. In all cases retrograde recanalization was done with coronary guidewire Whisper LS (Cordis). In one case additionally microcatheter Vasco+ (Balton) was used. The necessity of this technique usage was dictated by technical complexities with standard recanalization of the chronic occlusion. Coronary guidewire was inserted through the septal branch of the anterior descending artery into the right coronary artery with subsequent recanalization of the occluded segment. After that antegrade balloon angioplasty and stenting of previously occluded segment were carried out. In one patient it was impossible to recanalize the occlusion at all its length.

We can draw the conclusion, that retrograde recanalization of chronic coronary occlusion can be a method of choice for the treatment of such patients.

ENDOVASCULAR TREATMENT OF PATIENTS WITH CHD IN THE MID-TERM AFTER DIRECT MYOCARDIAL REVASCULARIZATION

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Purpose of study: to investigate the possibilities of endovascular treatment in the mid-term after surgical myocardial revascularization in patients with CHD.

Material and methods: we have studied the fate of 197 patients with CHD (57.2 ± 3.8 years), in whom coronary angiography and shuntography were performed 7.1 ± 0.8 months after surgical myocardial revascularization. Before coronary angiography 152 (77.1%) of patients had exertional angina of func. class III-IV (CCS), 34 (17.3%) had unstable angina, and 11 (5.6%) had MI (up to 3 weeks old). The indications for CAG were left main coronary artery lesion in 65 (33%) of patients, three-vessel disease in 148 (75.1%), two-vessel disease in 49 (24.9%). We have studied the state of 582 grafts in the mid-term after the operation: 332 (57%) aortocoronary grafts (among them 101 (30.4%) autoarterial and 231 (69.6%) autovenous) and 250 (43%) mammarocoronary grafts.

Results: Clinical improvement was seen in 176 (89.3%) patients: in 152 (77.1%) clinical signs of angina were completely absent, in 23 (11.7%) a decrease by 2 functional classes was noted. Only 8 (4.1%) patients had exertional angina of func. class III, while 9 (4.6%) had unstable angina; 3 (1.5%) patients had AMI. The cause of unsatisfactory clinical course in 6 (3%) patients consisted in occlusion and stenoses within the grafts, in 6 (3%) – in incomplete revascularization, in another 9 (4.7%) patients – in progressing atherosclerosis in native coronary arteries.

Control coronaro-shuntography revealed 539 (92.6%) patent grafts, among them 530 (91%) were in a good state, 9 grafts were in satisfactory state (with up to 50% stenoses in distal segments in 6 of them and diffuse lesion of the conduit with preserved satisfactory lumen – in 3); 22 (3.8%) grafts were occluded (8 arterial and 14 venous), in 21 (3.6%) cases hemodynamically significant stenoses were revealed (7 arterial and 12 venous). Stenotic and occlusive lesions occurred significantly more commonly in venous grafts – in 28 (12.1%) cases, and in 15 (4.3%) cases of the use of arterial grafts, $p < 0.05$.

Endovascular correction of 31 segments was carried out in 27 (13.7%) patients: 9 PTCA and 22 stenting procedures. Immediate angiographic success was achieved in 100%. With this, 18 (58.1%) endovascular procedures were performed in 16 patients in the grafts and the grafted arteries; 13 (41.9%) procedures in 11 patients – in native arteries (in 8 cases for progressive atherosclerosis, in another 5 cases for incomplete initial revascularization). Endovascular procedures allowed to decrease functional class of angina in 8 (29.6%), to decrease the need in antianginal drugs in 11 (40.7%) patients and to improve the long-time prognosis.

At the same time in several cases the changes in the grafts and the native arteries were accompanied by absence of angina with positive stress-test results and ischemic episodes revealed during 24-hour ECH monitoring (painless myocardial ischemia) – 7 (3.5%).

Conclusions:

1. In the mid-term after surgical myocardial revascularization the vast majority of patients with CHD (89.6%) have their clinical state improved: anginal attacks disappeared or became significantly less common, no transient myocardial ischemia was seen.
2. Successful performance of endovascular procedures with good angiographic results and clinical prognosis is possible in the long-term in the majority of patients with unsatisfactory functional state of the grafts, with incomplete revascularization and progressive atherosclerosis in native coronary arteries.

COMPARATIVE EVALUATION OF DEXAMETHASONE-ELUTING STENTS AND COBALT-CHROMIUM STENTS IN THE TREATMENT OF CHD

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(Tiumen)

Purpose: to evaluate the effectiveness of the treatment, the long-term results and MACE in two groups.

Methods and course of study: the study comprised 85 patients. Dexamethasone-eluting stents were implanted in 36 patients. Cobalt-chromium stents (Vision, Guidant Corp., USA) – in 49. Cardiac death and documented non-fatal MI were considered as late clinical events. Sudden cardiac death and all MI in the territory of the target artery were defined as related to in-stent thrombosis. Control angiographic examinations were performed only for clinical indications.

Results: baseline clinical characteristics were not significantly different between the groups. Mean age of the studied population was 53 years.

	Dexamet	ML vision
Follow-up	6.0±3.64	7.2±4.85
Males	79.6%	88.5%
Females	20.4%	11.5%
Diabetes	7.7%	8.2%
History of MI	34.6%	36.7%
Successful PTCA	100%	95.9%

Angiographic characteristics also were comparable in both groups.

The decrease of the frequency and of the severity of anginal attacks was registered in the group of patients with drug-eluting stents (50%, $p=0.025$) and in 32.7%, $p=0.82$ with bare stents.

The frequency of the major clinical events (MI) within the first 6 months in the group with bare stents was 12.2%. In patients with drug-eluting stents no MI were registered ($p=0.002$), despite clinical resteno-

sis rate in the compared groups was 6.1% and 11.5%. The number of re-admissions during the follow-up was higher in patients with Dexamethasone-eluting stents – 42.3% vs. 24% ($p=0.03$), which was related to repeated intracoronary interventions and elective stenting of other coronary arteries. The rate of repeated PTCA in the target artery was 2% in the group with cobalt-chromium stents, in the group of drug-eluting stents no repeated PTCA were carried out.

The analysis of PTCA complications did not reveal differences between the groups. No cases of cardiac death were registered during the follow-up.

Taking into account the comparability of both group as for sex and age, similar clinical characteristics and the usage of equal doses of Plavix, the rate of MI was significantly higher in the group with bare stents.

Thus, the low risk of complications during the follow-up, the decrease of the functional class of angina or absence of its manifestations after the implantation of drug-eluting stents suggest higher effectiveness of Dexamethasone-eluting stents as compared with cobalt-chromium stents.

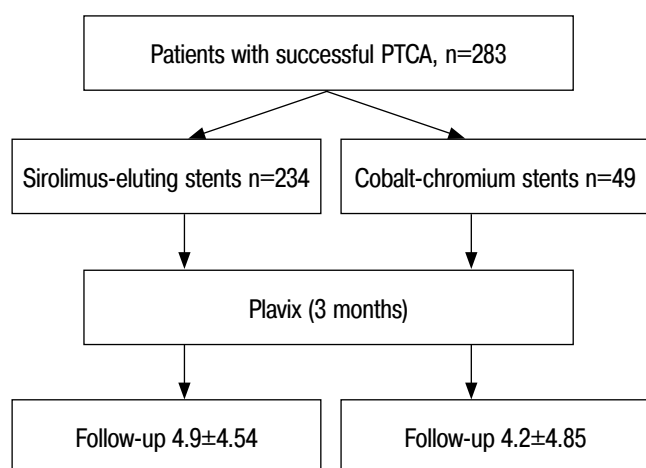
COMPARATIVE EVALUATION OF SIROLIMUS-ELUTING STENTS AND COBALT-CHROMIUM STENTS IN THE TREATMENT OF DIFFERENT FORMS OF CHD

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Purpose: to evaluate the effectiveness of the treatment and the long-term results; the complications due to intracoronary interventions with the use of two types of stents; major cardiac events (MACE) in two groups.

Methods and course of study: the study comprised 283 patients. Cypher stents (Cordis, Johnson & Johnson, USA) were implanted in 234 patients. Cobalt-chromium bare stents of third generation (Vision, Guidant Corp., USA) – in 49. Cardiac death and documented non-fatal MI were considered as late clinical events. Sudden cardiac death and all MI in the territory of the target artery were defined as related to in-stent thrombosis. Control angiographic examinations were performed only for clinical indications.

Results: baseline clinical characteristics were not significantly different between the groups. Mean age of the studied population was 53 years, there were about 85% males, 8% had diabetes mellitus, 40% had MI history. The majority of patients were at high coronary risk at admission. Angiographic and procedural characteristics also were comparable in both groups. PTCA was successfully performed in 97.9% patients with Cypher and in 95.9% with Vision stents.



The frequency of the major clinical events (MI) within the first 6 months was lower in the group with drug-eluting stents (2.6%), than in the group with bare stents (12.2%, $p=0.01$), despite the rate of clinical restenosis in the compared groups 4.7% and 6.1%, respectively. The number of re-admissions during the follow-up was significantly higher in patients with cobalt-chromium stents –24% vs. 12% ($p=0.03$). The rate of repeated PTCA in the target artery was somewhat lower in the group of drug-eluting stents (0.9% vs. 2%)

After the implantation of Sirolimus-eluting stents functional class of angina decreased significantly – $p=0.002$, vs. $p=0.08$ with bare stents. The analysis of PTCA-related complications did not reveal differences between the groups. No cases of cardiac death were registered during the follow-up.

Taking into account the comparability of both group as for sex and age, similar clinical characteristics and the usage of equal doses of Plavix, the rate of MI was significantly higher in the group with bare stents.

Thus, the low risk of complications during the follow-up, lesser number of repeated hospitalizations, the decrease of the functional class of angina or absence of its manifestations after the implantation of drug-eluting stents suggest higher effectiveness of Sirolimus-eluting stents as compared with cobalt-chromium stents.

PERCUTANEOUS CORONARY INTERVENTIONS IN ACUTE CORONARY SYNDROME

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The failures and disappointments related to pharmacological treatment of patients with acute coronary syndrome led to the change of the tactics of treatment of this cohort. The performance of primary PTCA in acute myocardial infarction and early invasive treatment in unstable angina allowed for a significant decrease of mortality and the optimization of the treatment of aggravations in patients with CHD.

Purpose of study: to evaluate the results of 2-years experience with percutaneous coronary interventions (PCI) in patients with acute coronary syndrome (ACS).

Material and methods. From January 1996 we performed 204 emergency coronary angiographies in the department of endovascular methods of diagnostics and treatment. Patients' age varied from 29 to 80 years, there were 171 men (84%), 128 (62.7%) patients underwent PCI: in 82 cases (64%) for acute myocardial infarction, in 46 (36%) for unstable angina. All patients underwent complex clinical and instrumental examination: ECG, coronary angiography, IVUS (in cases when coronary angiography did not reveal hemodynamically significant stenosis), determination of troponine T amount before the intervention, 8 and 24 hours after it.

Results. Angiographic success was achieved in 100%, 30-days mortality – 5 (3.9%), re-interventions were performed in 2 (1.5%) patients for acute in-stent thrombosis, rate of strokes – 0%, bleeding occurred in 1 patient (0.75%). As a result of PCI in patients with ACS, mortality in acute myocardial infarction decreased from 13.7% (data of 2005) to 5.7% (data of 2007).

Conclusions:

1. PCI is an effective and safe method of revascularization in patients with ACS.
2. PCI allows for significant decrease of mortality and increase of survival in patients with AMI.

THE USE OF THE SYSTEM JET 9000 FOR RHEOLYTIC CATHETER THROMBECTOMY IN THE SETTINGS OF MULTI-PROFILE HOSPITAL

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Last time the leading positions in the treatment of patients with acute thromboses went to high-technological methods, and this fact requires the search of the most optimal and effective approaches to invasive treatment. The unique system JET 9000 for rheolytic catheter thrombectomy gives the possibility for simultaneous destruction and elimination of thrombotic occlusions' material without using thrombolytic agents and with minimal risk of distal embolism. The system allows for relatively prompt elimination of small, as well as of massive thrombi. It increases the rate of procedural success, decreases the risk of complications, decreases the duration of in-hospital stay, decreases the rate of mortality.

Purpose of study: to evaluate immediate results, effectiveness and safety of the system JET 9000 for rheolytic catheter thrombectomy in patients with acute vascular and venous thromboses.

Material and methods: in 2007 in the department of endovascular methods of diagnostics and treatment we have performed 27 rheolytic catheter thrombectomies. Mean age of patients was 50.9 years (42 to 66 years), there were 25 men. The

interventions for AMI was performed in 20 patients. Angiographic characteristics of patients: 70% had multi-vessel coronary lesions, the interventions on the LAD were performed in 40%, on the CxB – in 20%, on the RCA – in 40%. In 17 (85%) patients rheolythic thrombectomy was performed as the first stage before traditional PTCA and stenting within 12 hours after the onset of acute coronary syndrome, in 2 (10%) at day 3 after primary PTCA; thrombectomy and subsequent PTCA were performed for subacute stent thrombosis. In 1 (5%) patient thrombectomy was performed during elective PTCA, for acute thrombosis developed in non-related coronary artery. In 3 (11.2%) patients (all men) the procedure was done in connection with acute aorto-femoral graft thrombosis, in 1 (3.7%) patient – for acute thrombosis of the common iliac artery. Two women (7.4%) underwent this intervention for pulmonary arterial thromboembolism.

Results: Angiographic and technical success was achieved in 100%. Mortality – 0 %. Strokes – 0 %.

Conclusions:

1. Rheolythic catheter thrombectomy using JET 9000 system is an effective and safe method in patients with acute and subacute coronary thrombosis.
2. Probably, this percutaneous coronary intervention allows to optimize the treatment of patients with acute thromboses of the arterial grafts and with pulmonary arterial thromboembolism.

FIRST EXPERIENCE WITH THE USE OF ROTATIONAL ATHERECTOMY IN PERCUTANEOUS CORONARY INTERVENTIONS

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The difficulties related to the performance of percutaneous coronary interventions in patients with in-stent restenosis and calcified coronary lesions are quite obvious. The use of rotational atherectomy in this category of patients opens new possibilities for the improvement of early and late results.

Purpose of study: to evaluate immediate and long-term results of rotational atherectomy in patients with in-stent restenosis and calcified coronary lesions.

Material and methods: 270 patients underwent percutaneous coronary interventions in the Department of endovascular methods of diagnostics and treatment in 2007. Our prospective study comprised 6 patients (4 men, 67%), aged from 58 to 79 years. Angiographic characteristics of patients: 3 (50%) patients were operated for in-stent restenosis. In 3 (50%) cases the interventions were performed for chronic total occlusions, with marked calcified, rigid atherosclerotic lesion. Initially all patients underwent traditional PTCA. In this group of patients it was impossible to perform adequate predilatation with balloon catheters of different profile and diameter. Rotational atherectomy was performed

with Rotablator (Boston Scientific Int., USA). It was started with minimal cutter diameter 1.5 mm, when necessary, the diameter was increased up to 2.0 mm. In 5 (83%) patients after successful rotablation stenting was performed, in 1 (17%) case of in-stent restenosis isolated rotablation gave good angiographic result.

Results: angiographic and technical success was achieved in 100%. The rate of perforations and dissections – 0%, mortality – 0 %, the rate of stroke – 0 %. In the long-term (over 6 months) all patients underwent control examination, including coronary angiography. The rate of restenosis – 0%, repeated interventions – 0%, myocardial infarction – 0%, mortality – 0%.

Conclusions:

1. Rotational atherectomy is seemingly an effective and safe method of revascularization in patients with in-stent restenosis and calcified coronary lesions.
2. Probably, the use of this method of revascularization will allow to optimize long-term results in this group of patients

TRANSCATHETER METHODS OF CORRECTION OF CONGENITAL HEART DEFECTS

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Background. Secondary atrial septal defect (ASD), isolated pulmonary arterial stenosis (IPAS) and coarctation of the aorta (CoAo) are among the most common congenital heart defects (CHD). Beside purely cosmetic aspect, the introduction into the clinical practice of transcatheter methods of CHD correction, aimed at the decrease of intervention traumatism, has an economical background (no need in deep and prolonged anesthesia, significant decrease of hospital stay).

Purpose. Evaluation of the effectiveness of endovascular methods of treatment of the most widespread congenital heart defects.

Material and methods. Thirty-four patients with different forms of CHD underwent transcatheter correction in the Center of cardiac surgery and interventional cardiology "Ivanovo Regional Clinical hospital". Balloon valvuloplasty was performed in 10 patients with IPAS (Group1), aged 8 ± 4 years; mean pulmonary arterial – right ventricular pressure gradient (PA/RV), assessed by intracardiac manometry, was 56.5 ± 21.5 mm Hg. Eleven patients with incomplete form of CoAo and 1 patient with aortic recoarctation developed 8 years after direct isthmoplasty were selected for balloon dilatation (Group 2); mean age of patients was 12.5 ± 4.5 years; mean pressure gradient, assessed by intracardiac manometry, was 42.5 ± 12.5 mm Hg. Endovascular closure of secondary ASD with Amplatze occluder was performed in 13 patients (Group 3) aged 3 to 14 years (flow diameter assessed by EchoCG: 5 to 24 mm).

All interventions were performed in the "Siemens" cathlab. The right heart catheterization during valvuloplasty was realized through transfemoral approach. In three patients a single balloon catheter with the diameter exceeding the size of pulmonary artery (PA) annulus by about 1.2 times, was used. In 7 patients we have used the technique of simultaneous inflation of two balloons with total diameter exceeding the size of pulmonary artery annulus by about 1.4 times. Among 11 patients with aortic coarctation (recoarctation) 2 underwent dilatation with one balloon, the remaining interventions were performed with two balloons (diameters ratio 1:1). Amplatzer occluders implantation (№ 7 – № 24) was performed through transfemoral approach under fluoroscopic and ultrasound visualization control.

Results. Valvuloplasty was effective in all Group 1 patients: according to the data of intraoperative manometry, endovascular dilatation in the area of valvular stenosis led to pressure gradient decrease from 56.5 ± 21.5 mm Hg to 16.5 ± 4.5 mm Hg.

Pressure gradient in the group of patients operated on for aortic coarctation (recoarctation) was also significantly decreased (from 42.5 ± 12.5 mm Hg to 7.0 ± 7.0 mm Hg), a pronounced increase of femoral arterial pulsation was noted, foot arterial pulsation appeared. Control rheovasography of the lower extremities revealed the presence of central blood flow in all patients.

Intraoperative EchoCG revealed absent blood shunting at the atrial level after transcatheter occlusion of the ASD in all 12 patients. Control ultrasound examination was carried out in all patients at day 2 after the procedure. EchoCG revealed partial occluder dislocation in one 4-year girl with a large defect (24 mm); this served as an indication for open-heart surgery. Radical correction – ASD patch closure – was performed under extracorporeal circulation after the removal of Amplatzer occluder. The patient recovered without complications.

Conclusion. Transcatheter methods of the treatment of the most common CHD (secondary ASD, isolated pulmonary arterial stenosis and aortic coarctation), have certain advantages over the traditional surgical techniques, are highly effective and, providing strict adherence to indications, can be recommended as a method of choice for complex treatment of this category of patients.

IMMEDIATE AND LONG-TERM RESULTS OF ASD CLOSURE USING AMPLATZER SYSTEM

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Purpose: To evaluate immediate and long-term results of atrial septal defect (ASD) closure using the Amplatzer system.

Material and methods: Since 2005, 69 patients with secondary ASD aged from 2 to 63 years have been included into the study. Before the intervention all

patients underwent transthoracic echocardiography with evaluation of defect anatomy, morphometry and hemodynamic parameters. Pulmonary hypertension of I stage was observed in 5 (7.3%) patients. All patients underwent ASD closure with the Amplatzer system. Intraoperative control was performed by means of transesophageal echocardiography in all patients. Aspirin was prescribed to all patients in average for 6 months.

Results and discussion: ASD closure was performed successfully in all 69 patients. Blood leakage through the occluder was observed in early postoperative period in 4 (5.8%) patients. Rhythm disturbances that resolved spontaneously were observed in one case (1.4%) within the first postoperative day. No cases of occluder dislocation were noted. Blood leakage through the occluder was observed in 2 patients (2.9%) during long-term follow-up period.

Conclusions: Closure of secondary ASD with the Amplatzer occluder is very effective and minimally traumatic method of the defect correction.

ENDOASCULAR SURGERY IN PATIENTS WITH OBLITERATING ATHEROSCLEROSIS OF THE LOWER LIMBS ARTERIES

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Purpose: to analyze the experience with endovascular interventions on infrainguinal arteries in obliterating atherosclerosis of the lower limbs' arteries.

Material and methods: we have analyzed the experience with 98 endovascular plastic procedures on femoral, popliteal and tibial arteries in obliterating atherosclerosis of the lower limbs' arteries. There were 86 (87%) men and 12 (13%) women aged 47 to 87 years (mean 74.5 ± 6.6 years). According to Fontain – Pokrovsky classification, 46 patients (47%) had IIb stage of the disease, and 52 (53%) – III – IV stage. Comorbidities were revealed in 87% of patients. These included CHD in 83.4%, history of MI in 28.3%, arterial hypertension in 78.4%, chronic cerebral circulation insufficiency in 34.8% of cases. The interventions on femoral arteries were performed in 30 (31%), on popliteal arteries – in 17 (18%), on tibial arteries – in 51 (52%) patients.

Among these procedures there were 60 (61%) isolated dilatations, 18 (19%) direct stenting procedures, as well as 20 (20%) stent placements after previous predilatation. The type of intervention was determined depending on the level of arterial lesion. Thus, stents were implanted in the femoral artery mainly after predilatation, while popliteal and tibial arteries were common sites of isolated dilatation.

Results: ischemia regress and clinical improvement were achieved in 78% of patients. The best effect was seen in patients with "short" stenoses and occlusions, as well as with good distal bed. The worse results were seen after the attempts of tibial arteries recanalization. The lack of success could be

explained mainly by the presence of significant, long distal stenoses and "blind" occlusions.

Endovascular interventions helped to decrease ischemic manifestations and to preserve the extremities in 80% patients with critical ischemia. Subsequently 4 patients required reconstructive surgery in this area. Reconstructive procedures on proximal arterial segments were performed in different time in 8 (9%) patients. In patients with II stage of the disease positive results (in the form of the increase of painless walking distance) was noted in 94.1% of cases.

Conclusions: endovascular methods are a good alternative to traditional methods of surgical treatment and are minimally traumatic, which is especially important for elderly and old patients with severe associated pathology; it also could be effective in patients with critical ischemia of the lower extremities.

LONG-TERM FOLLOW-UP OF INFARCT-RELATED ARTERY STENTING IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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The purpose of the study consisted in the analysis of long-term follow-up of the stenting, of risk factors for in-stent stenosis development after early and delayed stenting of the infarct-related artery (IRA) and the tactics of further treatment.

Material and methods: Group 1 comprised patients in whom a successful procedure of IRA stenting was performed within the first 24 hours after the onset of anginal attack (n=101). Group 2 comprised patients with AMI who underwent ORA stenting later (up to 21 days) after the onset of the disease (n=99). The information concerning the state of patients was obtained after 8.2±2.7 months in 91 patients from Group 1 and after 7.6±1.8 months in 94 patients from Group 2. repeated coronary angiography was performed in 71 patients from Group 1 and in 70 patients from Group 2. Clinical and historical data were not significantly different between the groups of study.

Results: in the long-term 73.6% of patients from Group 1 and 68.1% of patients from Group 2 were angina-free (p>0.05). The incidence of repeated (non-fatal) infarctions (1.9% vs. 1.1%) and cardiac mortality index (0.9% vs. 1.1%) also were not significantly different between the groups 1 and 2. Major cardiac events (angina recurrence, repeated MI, death) were mainly seen in patients with restenosis (22.5% vs. 25.7%) and reocclusion of IRA (4.2% vs. 5.7%), P>0.005. Hence, the incidence of the necessity of repeated interventions (PTCA and/or CABG) also was similar: 20.9% in Group 1 versus 24.5% in Group 2 (p>0.05).

The rate of in-stent stenoses in Groups 1 and 2 was 19 (26.8%) and 22 (31.4%) cases. According to Mehran classification (1999) in 4 (21.0%) and 5

(22.7%) cases the stenosis was local (up to 10 mm); in 7 (36.8%) and 8 (36.3%) cases – diffuse (over 10 mm), not exceeding the stent limits; in 5 (26.3%) and 5 (22.7%) cases – diffuse-proliferative, over 10 mm and exceeding stent limits; in 3 (15.8%) and 4 (18.2%) cases total occlusion was revealed (TIMI 0).

The analysis of factors influencing in-stent stenosis development has shown that it occurred more commonly in patients with diabetes mellitus, with postinfarction scars and LV EF <40%. Risk factors for in-stent stenosis in both groups also included coronary lesions of B2/C type, the presence of calcification, ostial lesion, the presence of collaterals in the IRA territory, baseline (true) artery diameter <3 mm, prolonged (over 15 mm) vascular lesion, baseline stenosis of the target segment >90%, as well as baseline occlusion of the target segment (only for Group 2 patients). Besides, in-stent stenoses were significantly more frequent with the use of stents of ≤2.75 mm diameter, stents length ≥18 mm, low STENT implantation pressure (≤7.5 atm.), wire stent design, bailout stenting, as well as in cases when the diameter of the stented segment was less than the true diameter of the vessel, or exceeded the true diameter of the vessel by over 10%.

Repeated balloon dilatation for in-stent stenosis was performed in 14 (73.7%) out of 19 patients in Group 1 and in 16 (72.7%) out of 22 patients in Group 2. The study of long-term follow-up (7.4±1.8 months) after PTCA of in-stent stenosis revealed the preservation of good results of the procedure in 71.4% and 68.7% of cases, respectively (P>0.05).

Conclusions: the stenting in AMI patients performed early (within 24 hours), as well as late (up to 21 days) after the onset, in general, gives similar long-term angiographic results and has similar causes of in-stent stenosis development. Diffuse type of in-stent stenosis was the most common in the groups of study. Repeated PTCA of in-stent stenosis in patients with AMI is an effective, safe and durable method for antegrade blood flow restoration.

IS IT NECESSARY TO STENT THE INFARCT-RELATED ARTERY IN ALL CASES OF ENDOVASCULAR TREATMENT OF ACUTE MYOCARDIAL INFARCTION?

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The purpose of study consisted in the analysis of the effectiveness of endovascular treatment of patients with acute myocardial infarction (AMI) after traditional percutaneous transluminal coronary angioplasty (PTCA) of the infarct-related artery (IRA) with the account of immediate angiographic result.

Material and methods: we have studied clinical and angiographic results achieved in 821 patients who underwent PTCA in the IRA within the first 24 hours from the onset of anginal attack: in 101 patients with IRA stenting (Group 1), 433 patients with opti-

mal results of primary PTCA of the IRA (residual stenosis <20% in the absence of threatening C-F dissection, restored blood flow TIMI 3) – Group 2; and 287 patients with suboptimal results of primary PTCA (residual stenosis 30-50%, in the absence of threatening C-F dissection, restored blood flow TIMI 2-3) – Group 3. The main indications for IRA stenting included: occlusion, threatening or occluding dissection, suboptimal results after primary PTCA of the IRA. The information concerning the state of patients in the long-term was obtained on the average after 8.2±2.7 months, 17.6±6.8 months and 18.3±7.2 months from 91 (92.8%), 376 (93%) and 235 (87.4%) patients from the Groups 1, 2 and 3, respectively. Control examination (including selective coronary angiography and left ventriculography) was performed in 71 (72.4%) patients from Group 1, 276 (68.3%) patients from Group 2 and 185 (64.4%) patients from Group 3. The main baseline clinical, historical and angiographic data were not significantly different between the groups.

Results: after PTCA uneventful in-hospital clinical course was seen in 93.1%, 94.6% и 81.9% of cases ($P<0.05$). There were significantly less cardiac events, such as death (2.9%, 1.6% vs. 5.2%), recurrent MI ИМ (0.9%, 1.5% vs. 3.8%) and angina requiring repeated interventions (2.9%, 2.1% vs. 7.6%) in groups 1 and 2, as compared with group 3 ($P<0.05$). The main cause of cardiac complications after standard PTCA and stenting of the IRA were in-stent thrombosis and reocclusion of the dilated vessel.

In the long-term restenoses were significantly less common in Groups 1 and 2 – 22.5% and 30.7% versus 41.6% in Group 3; the same concerned reocclusions – 4.2% and 4.0% vs. 16.7% in Group 3, $P<0.05$. Restenoses and reocclusions were the main causes of late cardiac events. The rate of cardiac death (0.9% and 2.1% vs. 8.5%), of recurrent AMI in the territory of IRA (1.9% and 2.6% vs. 13.6%), of recurrent angina requiring repeated PTCA/CABG (25.1% and 28.5% vs. 34.5%) the differences were significantly higher for patients with suboptimal results of PTCA ($P<0.05$).

In total in Groups 1 and 2 with preserved good results of PTCA there was a significant increase of LVEF, from 56.4±11.1% to 61.6±10.6% due to the improvement of infarct-related segments, EDV decreased from 155.2±25.9 to 146.4±23.1 ml, and ESV – from 66.6±27.1 to 55.7±22.3 ml ($P<0.005$). In patients with non-satisfactory long-term angiographic results there was an insignificant LVEF decrease, with significant increase of EDV and ESV.

Conclusions: the stenting of IRA and standard PTCA with optimal angiographic results are generally similar from the viewpoint of hospital and long-term clinical and angiographic outcomes. Hence, stenting of IRA after primary PTCA with optimal result is not mandatory. In cases of non-satisfactory or suboptimal result of PTCA, IRA stenting is necessary, allowing for the optimization of immediate angiographic results and, thus, the improvement of the prognosis.

EXPERIENCE WITH THE PREVENTION OF THROMBOEMBOLIC COMPLICATIONS IN TRAUMA PATIENTS

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Purpose: To demonstrate the efficacy and necessity of endovascular methods of prevention of thromboembolic complications, especially implantation of vena cava filters, in trauma patients.

Material and methods: since 2001, 65 patients have been examined (29 males and 36 females aged from 23 to 87 years), who had vena cava filters of different modifications implanted: TrapeEase, Sand-glass, OptEase. Disturbances of venous drainage are observed because of high traumatism and prolonged forced bed stay, and as a consequence, appearance of floating thrombosis in the veins of lower extremities and pelvis. Considering high percentage of young peoples among such patients, the use of removable vena cava filter was considered to be relevant. Starting from 2006, removable OptEase Cordis vena cava filters were implanted to 18 patients aged from 23 to 56 years and subsequently were removed within 1 month. There were no complications related to implantation and removal of removable vena cava filters.

Conclusion: No cases of PE after implantation of vena cava filters in patients with floating thrombosis were reported in this study, which is evident of high efficacy of this method. However, it should be taken into consideration that permanent vena cava filter, which is present in the human body for life, can cause reactions of rejection, inflammation and development of thrombosis of the inferior vena cava in the long-term. Considering all aforesaid, it may be preferable to use removable vena cava filters in patients, particularly in young people.

ENDOVASCULAR INTERVENTIONS IN THE TREATMENT OF SKELETAL TUMORS AND TUMOR-LIKE DISEASES

D.N. Samochatov (Moscow)

Purpose: To analyze the effectiveness of endovascular occlusion in patients with highly vascularized neoplasms of musculoskeletal system.

One hundred three patients aged from 12 to 79 years were examined and undergone 118 interventions for reduction of pathological blood flow in the revealed neoplasms. PVA COOK Emboli 100-700 microns and occluding WCE and IMWCE (COOK) coils of different dimensions were used for radio-endovascular occlusion (REO). PVA COOK Emboli 100-700 microns and occluding INWCE coils were used in 55.1% of cases, occluding IMWCE coils alone – in 22.0% of cases, and PVA COOK emboli 100-700 microns alone – in 22.9% of cases. In the

first group (52 patients) elective surgery with neoplasms resection was performed in 1-4 days after the REO. In this study REO efficacy was evaluated by loss of blood in operated patients and by changes over time of clinical manifestations in non-operated patients (the second group – 51 patients). A control group (30 patients) comparable by sex and age parameters, extent of vascularization, localization and volume of neoplasms and operative conditions was recruited for comparison with operated patients.

Conclusion: According to the results of the conducted study, blood loss in the first group was in 1.5 to 4-fold lesser than in the control group that received surgical treatment but without preliminary REO. Absence or reduction of pain intensity and improved quality of life were observed after the REO in patients from the second group; some of them underwent the REO 2 or 3 times.

CONCENTRATION OF CARDIOSPECIFIC ENZYMES IN CORONARY SINUS BLOOD AS A CRITERION FOR THE EVALUATION OF THE EFFECTIVENESS OF ENDOVASCULAR RESTORATION OF MYOCARDIAL PERFUSION IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Introduction: the evaluation of the quality of myocardial perfusion restoration in the territory of infarct-related coronary artery (IRA) in a patients with AMI after endovascular procedure performed within the first hours after the onset of the disease is a key moment in the search of an optimal technique for reperfusion therapy and the determination of the prognosis. The evaluation of antegrade blood flow using TIMI scale is the main angiographic criterion of the effectiveness of PTCA. Meanwhile the achievement of high TIMI grades is not always accompanied by total resolution of ST segment – the main criterion in the assessment of the quality of microcirculatory myocardial perfusion.

The purpose of this investigation consisted in the study of the dynamics of the concentration of cardiospecific enzymes (CSE) in the serum of coronary sinus blood (CS) during endovascular procedure aimed at the restoration of the blood flow in the IRA and in the comparison of the obtained data with the degree of ST resolution.

Material and methods: the study comprised 22 male patients aged 52.6 ± 11.4 years with first acute anterior STEMI. They underwent successful (TIMI 3) primary endovascular recanalization, angioplasty and stenting of the occlusion in the proximal segment of the LAD within 241.6 ± 108.8 minutes after the onset of the disease. Total ST resolution was determined immediately after the procedure in the informative leads. Three degrees

of ST resolution were found: 1. absence of dynamics of ST elevation – 3 patients (13.6%); 2. partial resolution of ST elevation – 6 patients (27.4%); 3. total resolution of ST elevation – 13 (59%). Group 1 comprised patients with total ST resolution ($n=13$); Group 2 – patients with partial resolution and absence of significant dynamics of ST segment ($n=9$). Serial blood sampling from the coronary sinus was performed initially, after reperfusion and then every 5 minutes for 20 minutes (6 samples in total) for the determination of the concentration of cardiospecific enzymes (CPhK, CPhK-MB, ACT). Coronary sinus catheterization and blood sampling were done with Corail catheter (Bult). Statistical analysis was carried out with software SPSS 10.0 for Windows.

Results: at baseline absolute values of CSE in both groups were not statistically different (115.3 ± 84.8 vs. 126.1 ± 114.4 ; $P=0.6$). Subsequently the dynamics of CSE concentration was significantly different: in Group 1 patients the dynamics of the increase was exponential, while in Group 2 patients CSE concentration increased smoothly and had a linear character. Starting from the 3rd point (of from the 5th minute after recanalization) the concentration of CSE in Group 1 patients was reliably higher. By the endpoint maximal differences in the CPhK were noted: 1128.9 ± 138.8 vs. 411.3 ± 112.1 ; $P<0.05$. Such significant difference was revealed by the analysis of the velocity of CSE concentration increase.

Conclusion: the rate of CSE “washout” from the infarcted myocardial area depends on the degree of ST resolution and can be used as an objective quantitative criterion of the quality of myocardial perfusion restoration in the territory of IRA.

DO THE STRESS-TEST RESULTS REFLECT THE STATE OF THE CORONARY ARTERIES IN PATIENTS WITH DIFFERENT FORMS OF CHD IN THE LONG-TERM AFTER BARE METALLIC STENTS IMPLANTATION?

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Purpose of study: to compare the results of stress-testing with the results of control coronary angiography in patients with stable angina in the long-term after bare metallic stents implantation.

Material and methods: the study comprised 216 patients aged from 27 to 74 years (mean age 53.6 ± 4.7 years), with exertional angina of func. class II-IV, in whom stress-testing was conducted directly before angiographic examination, and in whom coronary stenting was performed on the base of the results of coronary angiography. Mean number of significantly stenotic arteries was 1.89 ± 0.08 . In total 307 bare metallic stents were implanted. In the long-term follow-up (mean 6.0 ± 0.5 months) the patients were re-examined (in accordance with the protocol

adopted in the MCCIC); the examination included stress-testing and selective CAG.

Results: before stenting positive results of stress-testing were obtained in 176 (81.6%) patients, negative results – in 29 (13.3%), ambiguous results – in 11 (5.1%) patients. In the long-term follow-up negative results were obtained in 157 (72.7%) patients, positive results – in 73 (21.1%), ambiguous results were noted in 13 (6.0%) patients. On the average physical tolerance, as assessed by pre-stenting stress-testing, was 65.2 ± 6.6 Wt. In the long-term follow-up the average physical tolerance in stented patients was 90.7 ± 8.6 Wt. Control CAG revealed satisfactory results in 237 (77.3%) stented target arterial segments. Restenosis of the target segment (lumen narrowing in the site of intervention by over 50%) was revealed in 60 (19.6%) cases; occlusion in the target segment was seen in 10 (3.1%).

Conclusions: stress-testing performed in the long-term follow-up gave negative results in most patients, their physical tolerance increased. Restenosis development after endovascular procedures leads in most cases to positive stress-test results and lower physical tolerance. Meanwhile it is worth noting that in a quarter of patients with restenosis and reocclusion negative stress-test results were observed. Taking into account high incidence of “silent” in-stent stenosis after the stenting of complex morphological lesions, after recanalization of chronic occlusions, of high-degree stenosis, eccentric plaque, with the use of long or small diameter stents, it should be recommended to perform control CAG in the majority of patients, independently of stress-testing results.

ROLE OF DIVERGENCES IN VISUAL EVALUATION OF CORONARY LESIONS DURING PERCUTANEOUS INTERVENTIONS

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Purpose of study: to evaluate the rate and the distribution of divergences during visual analysis of baseline lesions of the coronary arteries (CA), subjected to PTCA, as well as their role in the analysis of final result of PTCA.

Material and methods: this study comprised 200 patients with CHD who underwent PTCA in Voronezh Regional clinical hospital N1 from January 2004 till December 2006. Single-vessel PTCA was performed in 156 (78%) patients, two-vessel – in 38 (19%) patients and three-vessel – in 6 (3%). We have randomized and analyzed angiograms of 35 patients from the treated cohort. Complete angiographic data were obtained in 14 patients, partial angiographic data were collected in 21 patients. The lesions were evaluated by three independent observers. Stenosis localization, its

degree and length, as well as target diameters of the artery in the site of lesion, proximal and distal to the stenosis were evaluated. Maximal difference in expert conclusion was considered as a divergence. Beside visual evaluation we have used quantitative coronary analysis performed with the software of ANGIOSTAR PLUS angiographic complex.

Results: there were 92.5% men and 7.5% women, their mean age was 53 ± 9 years. The LCA lesion was present in 73.7% of cases, the RCA lesion – in 20.1%, both arteries' lesion – in 5.1%. One out of 200 treated patients (0.5%) had a lesion in the autovenous graft. The length of the damaged segment varied from 3 to 28 mm (mean 15.0 ± 4.8 mm). Target diameter of the vessel in the site of stenosis was 3.15 ± 0.11 mm. Average baseline stenosis degree was $86 \pm 14\%$ (45% to 100%). The differences in lesions' localization with expert assessment of baseline angiograms were noted in 57%. The differences in the determination of segments (proximal, middle, distal) of the same CA were noted in 50%, and in 7% of cases different experts described different 1st or 2nd order branches. Complete coincidences in the evaluation of baseline stenosis degree were found in 14% of patients, deviations up to 10% of stenosis degree – in 43%, up to 20% of stenosis degree – in 66%, and over 20% of stenosis degree – in 19% of patients.

After balloon predilatation performed before stenting significant residual stenosis of the target vessel was not visualized in 78.5% of patients with single-vessel disease, in 65.9% of patients with two-vessel disease and in 66.7% of patients with three-vessel disease. After stenting residual stenosis was not revealed in 99.5% of patients with single-vessel disease, in 87.0% of patients with two-vessel disease and in 75.0% of patients with three-vessel disease. The evaluation of baseline lesion degree was related to the characteristics of the final stenosis. In cases of coincidences in the evaluation of the baseline stenosis, the incidence of residual stenosis descriptions was at its maximum – 100%, while, on the opposite, with in the presence of divergences in visual evaluation of baseline stenosis the incidence of residual stenosis registration was significantly lower (33% to 75%; $p=0.002$ as compared with the group of minimal divergences). Detailed analysis of the correlations between the degree of baseline and residual stenoses will be presented.

Conclusions: the differences in target stenosis location are seen more than in one half of descriptions (57%), while the divergences in the evaluation of baseline lesion degree exceed 20% in 19% of patients. The lack of divergences or minimal divergences in the evaluation of baseline stenosis leads to more substantial analysis of the final result of intervention with maximal incidence of residual stenoses description.

EMERGENCY AORTIC CATHETER BALLOON VALVULOPLASTY

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Severely ill patients with aortic stenosis who cannot be treated with the use of traditional methods make a special group. Sharply disturbed LV function and circulatory decompensation manifest clinically as total heart failure. Significant disturbances in LV morphology and function due to prolonged myocardial hyperfunction and chronic ischemia, pronounced conduction disturbances can cause sudden death at any moment, lead to acute heart weakness on the background of chronic heart failure.

Purpose of study: to evaluate the possibilities of performance and the results of emergency catheter balloon valvuloplasty (CBV) in patients with aortic stenosis developing acute LV failure.

Material and methods. From 1997 to 2007 we have studied 478 patients with aortic stenosis in whom the defect correction was indicated. There were 76 women and 402 men aged 26 to 69 лет (mean, 55.0 ± 6.8 years). Concomitant coronary disease was diagnosed in 17.9% of patients, other valves' disease – in 29.3%. 432 patients have been examined during compensation stage – in them, elective aortic valve replacement was indicated. According to the data of clinical and instrumental investigation 46 severely ill patients were recognized as non-operable in the settings of extracorporeal circulation and classified as «extremely high-risk patients» (B.E. Shakhov, 2001). Catheter balloon valvuloplasty was planned in them as the first stage of treatment.

LV failure, that could not be stopped with pharmacological agents, developed in 21 patients, among them – in 12 extremely high-risk patients, and in 9 compensated patients. The indices of LV functions in these patients were significantly decreased. They underwent emergency CBV in accordance with the technique adopted in our clinic, Silin-Sukhov balloon catheters were used (St.Petersburg, Russia). Mean time from the onset of LV failure to the beginning of the procedure was 2.3 ± 0.9 hours.

Results. After aortic CBV aortic orifice area increased by $101.2 \pm 7.8\%$, systolic gradient across the aortic valve decreased by $56.7 \pm 8.4\%$. In 11 cases CBV resulted in stabilization and improvement of hemodynamics, EF increase by $22.5 \pm 8.1\%$ on the average, which was accompanied by progressive improvement of the patients' state. After the procedure, despite LV decompression, acute LV failure progressed in 4 patients (all of them died), aortic insufficiency increased in 1 patient (the patient died). In 1 case CBV was not performed because of pronounced aortic insufficiency (the patient died). It is worth noting

that two out of 3 dead patients initially were in extreme risk group. We analyzed the results of examination and determined eventual predictors of decompensation development.

Conclusion. Catheter balloon valvuloplasty is an effective method of treatment for the patients with aortic stenosis with acute LV failure, allowing for LV decompression and cessation of decompensation signs.

RESULTS OF ENDOVASCULAR MYOCARDIAL REVASCULARIZATION IN PATIENTS WITH CORONARY HEART DISEASE AND VENTRICULAR DYSRHYTHMIAS

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Purpose of study: to evaluate the influence of endovascular myocardial revascularization on the restoration of heart conductive system in patients with coronary heart disease with ventricular dysrhythmias.

Methods and material. We have studied the results of endovascular treatment of 10 patients with coronary heart disease with ventricular dysrhythmias. Among them there were 2 women and 8 men aged 33 to 67 years. Complete clinico-instrumental examination included ECG monitoring (ECGMt), Doppler- and EchoCG (DEchoCG), stress-EchoCG, selective coronary angiography (SCAG) before and at different time after revascularization. Exertional angina of the 3rd functional class was in 8, history of myocardial infarction – in 8 patients. Two patients had circulatory insufficiency of NYHA class II. Dysrhythmias of Lown degree 2 were in 6 patients, of degree 3 – in 2, of 4b degree – in 2 patients. Stress-EchoCG revealed low physical tolerance in all patients. With the peak exercise frequent monomorphic ventricular extrasystoles (Lown degree 2) was registered in 4 patients, unstable ventricular tachycardia (Lown degree 4b) – in 6. All patients received antiarrhythmic therapy. SCAG revealed single-artery coronary disease in 1 patient, two-vessel disease – in 6, three-vessel disease – in 2. The degree of coronary lesion was evaluated using Yu.S.Petrosian and D.G. Iosseliani system (1977) and D.Leaman scale (1983), the degree of revascularization – according to E.B. Shakhova method (2006). Follow-up period lasted from 6 months to 3 years.

Results. Complete revascularization was achieved in 7 patients, incomplete – in 3. After the revascularization conduction system's function restored in 6 patients (complete revascularization), significantly improved (only 1st degree ventricular dysrhythmias) – in 4 (complete revascularization – in 1, incomplete revascularization – in 3). In the long-term high physical tolerance was noted in 6 patients (complete revascularization), moderate –

in 4 (complete revascularization – in 1, incomplete revascularization – in 3). Rare single monomorphic ventricular extrasystoles at the peak of physical load was registered in 2 patients with incomplete revascularization. After complete revascularization ventricular dysrhythmias during physical load were not registered. Only two patients with incomplete revascularization were in need of antiarrhythmic therapy.

Conclusions. Endovascular myocardial revascularization in patients with ventricular dysrhythmias leads to restoration or significant improvement of conducting system's function (including the cessation of life-threatening arrhythmias), to the decrease or total discontinuance of antiarrhythmic medications, As well as to the improvement of the quality of life. The intervention in patients with coronary heart disease and ventricular dysrhythmias should be aimed at complete revascularization, which provides better postoperative restoration of conducting system's function.

CLINICAL CHARACTERISTICS OF PATIENTS WITH COMBINED ATHEROSCLEROTIC LESION OF THE RENAL AND CORONARY ARTERIES

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Purpose. We have studied the prevalence and the degree of atherosclerotic renal artery stenosis (RAS) in patients after selective coronary angiography. The diagnosis of RAS was suspected on the basis of clinical manifestations or laboratory data, but was not reliably verified.

Background. The diagnostics of atherosclerotic RAS remains problematic due to the lack of strictly specific clinical manifestations.

Methods. During 12-months period the patients treated in regional clinical hospital NN 2 and 3 were subjected to non-invasive and invasive diagnostic procedures. After examinations all patients were randomized with the account of standard clinical, laboratory and angiographic criteria. The patients with at least one of four pre-determined selection criteria (marked hypertension, unexplained renal failure, acute pulmonary edema with hypertension, or marked atherosclerosis) were registered and underwent diagnostic angiography of the abdominal aorta and, when necessary, selective renal angiography.

Results. Selective renal angiography was performed in 81 patients. Angiographically verified atherosclerotic RAS was revealed in 39% of patients, over 50% RAS – in 14.3%, severe RAS (>70%) – in 7.3% of patients. Marked stenosis was present in 7% of patients with systemic atherosclerosis, in 16% with renal dysfunction, in 9% with hypertension, and in 22% with acute pulmonary edema. The prevalence

was higher in patients with multiple predisposing factors. Elderly age, female sex, increased creatinine level, arterial hypertension and atherosclerotic lesions of peripheral or carotid arteries were RAS-associated factors.

RHEOLYTIC THROMBECTOMY – ITS POSSIBILITIES AND FIRST RESULTS OF THE TREATMENT OF ACUTE THROMBOSES

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The purpose of study consisted in the evaluation of the possibility of using rheolytic thrombectomy (RTE) in practical surgery and of the early results achieved in the treatment of lower extremities' veins and arteries, as well as of transjugular intrahepatic portosystemic grafts (TIPS).

Material and methods: we have an experience with 33 rheolytic thrombectomies with JET 9000® complex and Xpeedior® catheter in 31 patients aged from 43 to 81 years. In 24 cases the interventions were performed for acute thromboses of the lower extremities' arteries and shunts, in 5 cases – for floating thrombi in the inferior vena cava, and in 4 cases – for in-stent thrombosis after TIPS.

Results: in the group of patients with native arteries' thromboses (n=19) RTE led to the restoration of >50% of the arterial lumen in 16 cases. In 3 patients from this group the lumen was restored by 50% or less. In the group with shunt thromboses (n=5) angiographic success was achieved in 2 cases. In one case RTE led to the restoration of >50% of the arterial lumen, in another patient the lumen was not restored. 19 patients underwent: 13 balloon angioplasties (BA), 4 stentings, 2 regional thrombolyses. In two patients post-dilatation endarterectomy was performed after RTE and BA. In one case shunt RTE was complemented by proximal anastomosis reconstruction with a synthetic patch. In two patients RTE was complicated by deep femoral artery embolism. In the group of patients with floating thrombi in the inferior vena cava successful results were achieved only in 2 cases. In patients with in-stent thromboses after transjugular intrahepatic portosystemic bypass grafting (TIPS) grafts' patency was restored in all cases. During the follow-up 3 patients had their grafts re-thrombosed. Hemolysis with acute renal failure developed in two patients after RTE. Long-term results were followed up to 24 months in the groups of patients with arterial thromboses and thromboses of the lower extremities' grafts. In 17 (77.3%) of them remodeled segments remained patent, in 5 (22.7%) the leg was amputated.

Conclusion: according to our primary experience, RTE with Jet 9000 complex is a clinically effective, safe and low-traumatic method for the treatment of patients with acute arterial and venous thromboses of different localization, especially in cases with severe associated pathology.

BALLOON ANGIOPLASTY OF LOWER LEG'S ARTERIES

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Purpose: to evaluate the feasibility and the results of balloon angioplasty of lower leg's arteries in patients with chronic ischemia of the lower extremities.

Material and methods: we have an experience with 124 endovascular interventions on 77 legs of 73 patients for the restoration of the patency of 124 arteries. 68.5% of patients were men (50/73), 31.5% (23/73) – women, the age varied from 37 to 86 years (mean – 65.3 years). The vast majority of patients (86.3%; 63/73) had severe concomitant diseases, which potentiated the risk factors: CHD was present in 63.0% of patients, 11.7% had a history of myocardial infarction. Arterial hypertension was present in 60.3%, diabetes mellitus – in 53.4% of patients. Distribution of patients according to ischemia degree: IIB– 26.9%, III– 28.3%, IV– 44.8%. The length of obliterated segments varied from 1 to 30 cm. Endovascular interventions were predominantly performed for long stenoses and occlusions (over 5 cm) of lower leg's arteries (67% of cases). Isolated interventions in one of the of lower leg's arteries were performed in 32 (46.6%) patients, the patency of two arteries was restored in 34 (49.3), and multiple interventions, that is, in more than 2 arteries were performed in 7 (9.6%) patients. In 53 (72.6%) patients balloon angioplasty of lower leg's arteries was associated with angioplasty of other arterial segments.

Results: primary technical success of angioplasty of lower leg's arteries was achieved in 96.0% of cases (119/124). The complications not requiring surgical interventions developed in 8 (7.7%) patients and included 5 thromboses, 2 intimal dissections and 1 arterial rupture. The study of short-term results (up to 30 days) revealed clinical improvement in 84.9% of patients, none of patients needed reconstructive surgery. One amputation at midleg level was performed (1.4%), one patient (1.4%) died from acute myocardial infarction. The ankle-brachial index increase on the average from 0.59 to 0.88 ± 0.24 ; percutaneous O₂ tension (mTO₂) – from 21.2 to 49.5 ± 9.3 mm Hg. In the long-term (up to 2 years) another two patients (4.1%) underwent leg amputation, and there were 2 additional deaths (4.1%) – from myocardial infarction and acute cerebrovascular insufficiency. Thus, cumulative leg preservation (Kaplan-Meier) after 1 and 2 years was achieved in 90.2% and 79.8%, while survival after 1 and 2 years was 80.6 % and 69.6%.

Conclusion: balloon angioplasty of lower leg's arteries is an effective method for the treatment of lower extremities' ischemia. The level of primary angiographic and clinical results of endovascular treatment is satisfactory. In patients with critical ischemia of the lower extremities and diabetic angiopathy this method is often the only mean of surgical correction of the impaired blood flow. Balloon angioplasty of

lower leg's arteries allows not only for leg salvage, but also for the improvement of the patient's quality of life.

OUR EXPERIENCE WITH THE USE OF EUCATAX STENTS IN PATIENTS WITH CORONARY HEART DISEASE

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Introduction: early and late complications such as thrombosis and restenosis, are still the main problem seen after PTCA with stenting. The introduction of double-coated EUCATAX stents (synthetic Glycocalyx and paclitaxel) allows to hope for a decrease of the incidence of post-PTCA complications.

Purpose: to evaluate the effectiveness and safety of the use of EUCATAX stents with double coating in patients with coronary heart disease (CHD), including with acute coronary syndrome (ACS).

Material and methods: from June 2005 to September 2007 in Myasnikov Institute of Cardiology 553 underwent PTCA and received in total 675 EUCATAX stents. Among these patients, 436 (78.8%) had stable angina of II-IV func. class, 117(21.2%) had ACS and 133(24%) had diabetes mellitus. Mean age of patients was 52 ± 12.3 years. One stent was implanted in 406 patients, 2 stents – in 75, 3 stents – in 68 and 4 stents – in 4 patients. Single-vessel disease was present in 73.4%, two-vessel – in 13.5%, three-vessel – in 12.2%, and 0.7% of patients had four-vessel disease. In 75.8% of cases (512 stents) we performed direct stenting, in 24.2% (163 stents) – with predilatation. The degree of stenosis of the coronary arteries, in which the EUCATAX stents have been implanted varied from 60% to total occlusion. The diameter of the used stents varied from 2.5 to 4 mm (mean, 3.0 ± 0.8 mm), the length – from 13 to 38 mm (mean, 23 ± 2.4 mm).

Before PTCA and during in-hospital stay after the intervention the patients underwent physical examination, ECG recordings, biochemical blood analysis with the determination of cardiospecific enzymes level (C K-MB, Troponine, ALT, ACT), the patients with CHD without ACS had their stress test performed.

Results: no complications were seen after EUCATAX stents implantation. During in-hospital follow-up there were no cases of hospitalization related to cardiovascular pathology, clinical symptoms did not aggravate. After PTCA we noted a reliable decrease of the number of anginal attacks, of the used short-effect nitrates, of functional class of angina, as well as the increase of physical tolerance while walking ($p < 0.001$). VEM data suggest significant decrease of the

time before the occurrence of myocardial ischemia ($p=0.01$). No significant increase in cardiospecific enzymes levels was seen 12 and 24 hours after PTCA.

Control coronary angiography carried out in 84 patients 8-12 months after the intervention revealed restenosis in 10.7%. In-stent restenosis was present in 7 patients (8.3%), 2 patients (2.4%) had restenosis in a segment of the stented artery.

Conclusion: our experience with the use of EUCATAX stents demonstrated their high safety and effectiveness in patients with CHD, which was proved by the absence of post-PTCA complications.

OUR EXPERIENCE WITH ENDOVASCULAR TREATMENT OF THE ATHEROSCLEROTIC LESIONS OF INTERNAL CAROTID ARTERIES

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Purpose of study: to evaluate the results of stenting of internal carotid arteries (ICA) in patients with cerebrovascular lesions.

Material and methods. From 2001 till 2007, 80 patients underwent 85 stentings of the internal carotid arteries.

The patients' age varied from 45 to 79 years, there were 74 men and 6 women, all with symptomatic stenoses $>75\%$. Bilateral 75% lesions were revealed in 38 patients, 7 patients had occlusion of contralateral ICA. One patient was after endarterectomy, in 4 patients endarterectomy was impossible due to insufficient AP above the site of clamping with insufficient collateral blood flow.

In 26 patients stenting of ICA was a stage in further revascularization of the arteries from the other pools.

Preoperative examination included: transcranial Dopplerography, CT, cerebral MRT, subtraction angiography, neurological study.

Prior to the intervention the patients received Plavix 75 mg for 4 days, aspirin 100 mg for 4 days

The intervention was performed through femoral (58), brachial (2) approach.

Self-deploying stents of conical, free conical, cylindrical design with open or closed cell design (Cordis, Cook, Abbott vascular, Boston Scientific, Invatec, Guidant) were used. In one case of severe proximal tortuosity of ICA a balloon-deployable stent was implanted.

The systems for the protection from distal embolism: filters (Cordis, Abbott Vascular, Boston Scientific, Invatec) were used in all cases of ICA stenting.

Results: the procedure was successful in 98%, in one case the guiding catheter and the guide could not be inserted due to severe tortuosity of the iliac and common carotid arteries.

In all cases the procedure was ended by ICA stenting.

Perioperative complications: 1. Reflex spasm of ICA – 5 cases (eliminated with intraarterial nitrates administration) 2. Transient ischemic attack, small stroke – 3 cases. Regress of neurological symptoms in up to 1 month. 3. Stroke and death as a result of hyperperfusion syndrome at day 2 after stenting (during the initial period of the use of this method).

Conclusion: stenting of ICA is an effective method of treatment for atherosclerotic lesions of ICA. Detailed study of complications will allow to develop the measures for their prevention, thus increasing the safety of ICA stenting.

In some categories of patients this method can represent a unique possibility for the prevention of ischemic stroke.

SIMULTANEOUS VENTRICULAR SEPTAL ABLATION AND CORONARY STENTING IN COMBINED HYPERTROPHIC CARDIOMYOPATHY AND CORONARY HEART DISEASE

E.A. Shloydo, V.K. Sukhov, I.N. Kochanov (St. Petersburg)

Alcohol septal ablation is an effective method of treatment for the patients with obstructive HCM, resistant to pharmacological therapy. It is known that hemodynamically significant atherosclerotic changes in the coronary vessels revealed in these patients at coronary angiography constitute an additional unfavorable prognostic factor. Up to the last times such combination of diseases was an indication for aorto-coronary bypass grafting and myosepectomy.

Three out of 45 patients who underwent alcohol ventricular septal ablation for obstructive HCM had simultaneous endovascular intervention: septal ablation and coronary stenting. Coronary angiography revealed single-vessel disease in 2 patients (c 90% LAD stenosis, 85% RCA stenosis), 1 patient had two-vessel disease (85% LAD stenosis and 90% LCx stenosis). All patients had marked obstruction of the left ventricular outflow tract with gradient at rest 55 to 85 mm Hg. Clinical picture was dominated by drug-resistant anginal syndrome (func.class III).

Septal ablation was conducted under Echo-control of the target septal myocardium area. As a result of ablation the gradient decreased intraoperatively to 20-30 mm Hg. The patients with single-vessel disease received 1 drug-eluting stent in the LAD and 1 bare stent in the RCA, the patient with two-vessel disease – a drug-eluting stent in the LAD and a bare metallic stent in the LCx. The complications in the form of complete transverse block, ventricular arrhythmias did not develop in any case.

Immediately after the procedure all patients noted significant improvement with functional class of angina decreasing to I. During the next year of

the follow-up the effect of treatment was stably preserved: there were no complaints on angina, pressure gradient remained hemodynamically insignificant, ventricular septum thickness reduced, EF remained normal, there were no signs of coronary restenosis.

Despite our small experience with such interventions, this study demonstrated the effectiveness and safety of simultaneous endovascular intervention in combination of obstructive HCM and CHD. Such approach to the treatment of these patients can be considered as an alternative to surgical treatment.

METHOD OF UTERINE ARTERY EMBOLIZATION FOR THE TREATMENT OF UTERINE MYOMA

B.M. Shukurov, A.V. Kaplieva (Volgograd)

Uterine artery embolization was performed in 25 women aged 35 to 49 years. Symptomatic uterine myoma, or its asymptomatic rapid growth were considered indications for the procedure. Most women complained of abundant menstrual bleedings (18), symptoms of adjacent organs compression (12), weakness (20) rapid fatigue (21). Anemia of different degree was seen in 15 women. Four patients had no subjective clinical manifestations, but the examinations revealed rapid growth of myomatous nodes.

Myomatous nodes' diameter varied from 15 mm to 12 cm, the significant volume of all nodes (over 60-75%) had intramural, subserous and submucous location, no neck was revealed. In 12 cases there were multiple myomatous nodes.

The procedures were performed according to the standard technique using Roberts catheter, hydrophilic guide and a suspension of polyvinyl alcohol with particles measuring 500-700 μ on both sides.

Immediate technical success was noted in 94% of cases.

In one case uterine arteries could not be embolized on both sides because of complex anatomy. However in this case clinical result was achieved, probably due to the produced circulation disturbances in the successfully embolized uterine artery (myomatous nodes were located on the side of successfully closed uterine artery)

No complications occurred. Different degrees of postembolic syndrome were noted in 20 women; after 8 to 36 hours its signs disappeared.

The patients were discharged at day 2-3 after the procedure.

Control ultrasound examination of the blood flow in the myomatous nodes revealed different degrees of circulation interruption in all cases.

Subjective clinical improvement was noticed in all cases.

The results of uterine arteries embolization for the treatment of uterine myoma are suggestive of high clinical effectiveness, low traumaticity of the technique and rapid rehabilitation after the procedure.

ENDOVASCULAR SURGERY OF PATENT DUCTUS ARTERIOSUS USING A NEW TYPE OF DETACHABLE COILS

B.M. Shukurov, G.V. Kozlov, M.V. Frolov, A.P. Dushkina, V.A. Nemchuk (Volgograd)

Our study comprised 61 patients with patent ductus arteriosus (PDA) who underwent endovascular ductus embolization with a new type of coils.

The study group included 34 female and 27 male patients, aged from 1 year 1 month to 27 years (mean 5.9 ± 0.65 months), with body weight from 9 to 73 kg (mean, 22 ± 1.8 kg). Twenty patients (10 males) were under 3 years of age, 38 (14 males) – were 3-6 years old, in 3 cases (2 males) the procedure was performed in patients over 16 years of age. The isolated PDA was found in 49 (80%) patients, 5 (8%) had duct recanalization after surgical ligation and in 7 patients (12%) PDA was associated with different cardiac pathologies – pulmonary valve stenosis (3 pts), restrictive VSD (3 pts), ASD II (1 pt). General status of all patients was judged as satisfactory. 29 patients (47.5%) had no complaints at all. Some patients had concomitant diseases, like Down syndrome, obesity, nodular goiter, atopic dermatitis, chronic gastritis, chronic pyelonephritis, incomplete duplication of kidneys, hypoferric anemia, etc.

The patients were distributed into 4 groups depending on PDA diameter, as judged by ACG data. PDA diameters varied from 0.7 to 4 mm. Group I (PDA diameter < 1.0 mm) comprised 14 patients (23%); group II (PDA diameter from 1.0 to 2.0 mm) – 25 patients (41%); group III (PDA diameter from 2.0 to 3.0 mm) – 19 patients (31%); and group IV (PDA diameter from 3.0 to 4.0 mm) included 3 patients (5%). Before embolization all patients underwent diagnostic angiographic study. After aortography, if PDA was found, we determined its anatomic form. In accordance with the classification, suggested by A.Krichenko, 41 of our patients (67.2%) had A type of PDA, 9 (14.8%) – C type, 6 (9.8%) – E type and 5 patients (8.2%) had PDA recanalized after previous surgical interventions. The diameter of PDA assessed by aortography data, varied from 0.7 to 1.2 mm in group I (mean – 1 ± 0.03 mm); from 1.5 to 2.0 mm in group II (mean – 1.84 ± 0.04 mm), from 2.5 to 3 mm in group III (mean – 2.8 ± 0.06 mm) and from 3.5 to 4 mm (mean – 3.8 ± 0.16 mm) in group IV.

After heart catheterization we determined the degree of pulmonary hypertension (classification of V.A. Boukharin, L.R. Plotnikova, 1976). The following results were obtained: 56 patients (92%) were free of pulmonary hypertension, 5 (8%) had grade I pulmonary hypertension, among them 3 (4.8%) (2 patients from group III and 1 patient from group IV) had IA and 2 (3.2%) (both – from group IV) – IB pulmonary hypertension.

The analysis of immediate clinical obtained with the new type of detachable coils for PDA embolization in 63 patients revealed successful embolization

in 58 cases (92%): 12 in group I (19%); 25 in group II (39.7%); 19 in group III (30.2%); 2 in group IV (3.1%). One patient (1.6%) from group IV had small residual shunt through the duct, however EchoCG performed 1 day after the procedure did not reveal pathological shunt through PDA. Coil imbolization could not be performed in 4 patients (6%), but 2 of them (3%) had their duct occluded due to its intima destruction with subsequent thrombus formation.

Coil migration was revealed in 1 patient (1.6%) and was caused by faulty diameter selection of the used coil.

In the follow-up period (1 to 5 years) control EchoCG and X-ray studies revealed stable coils fixation in the implantation sites without signs of blood shunt.

Conclusions: the new type of detachable coils is highly effective and safe for the closure of patent ductus arteriosus.

OUR EXPERIENCE WITH ENDOVASCULAR CLOSURE OF CONGENITAL ATRIAL SEPTAL DEFECTS

B.M. Shukurov, G.V. Kozlov, M.V. Frolov,
A.P. Dushkina, V.A. Nemchuk (Volgograd)

We perform endovascular procedures using Amplatzer septal occluders in patients with congenital atrial septal defects (ASD) from October 2003.

ASD were closed in 70 patients (65 females). The patients' age varied from 18 months to 38 years (mean, 10.7 ± 5.2 years).

The patients complained of weakness, poor physical tolerance, dyspnea. The majority of patients (41) had a history of frequent catarrhal diseases, 5 of them had pneumonias. Prior to the procedure all patients underwent standard echocardiographic examination (EchoCG), if necessary – transesophageal EchoCG was performed. According to EchoCG data, all ASDs were central, with the diameters varying from 12 to 36 mm (mean, 23.7 ± 6.1). The upper rim of the defects varied from 2 to 15 mm (mean, 7.8 ± 2.6), the lower rim – from 7 to 13 mm (9.4 ± 0.7). Heart catheterization revealed hemodynamic changes in pulmonary circulation corresponding to the second stage of pulmonary hypertension in most patients. Pulmonary arterial pressure varied from 37 to 46 mm Hg (mean, 37 ± 10 mm Hg). The volume of blood shunting into the pulmonary circulation varied from 38% to 53% (mean, $41 \pm 8\%$). In all cases endovascular ASD closure was performed under EchoCG (64 – transthoracic, 6 – transesophageal) and radiological control. In 2 cases the Amplatzer device could not be safely fixed in the plane of interatrial communication. Test traction after both discs deployment led to the device displacement into the right atrium. Taking into account high risk of device migration into the right atrium after its disconnection from the delivery system, we decided to refuse endovascular closure of the defect and the patients were recommended to

undergo standard surgical closure. To our opinion, technical failure in these cases was related to a small lower rim and its significant elasticity. In other cases no intra-procedural complications were encountered.

After the procedure minimal residual shunt was revealed in 12 patients for 3 months, then it disappeared. Control examination performed in the long-term follow-up (6-18 months) showed good clinical state in all patients.

Thus, this method of treatment is effective and safe for the closure of ASD-II.

ENDOVASCULAR RECONSTRUCTION OF THE LEFT VENTRICULAR OUTFLOW TRACT FOR HYPERTROPHIC SUBAORTIC STENOSIS

B.M. Shukurov, R.Kh. Bolshakova, A.P. Dushkina
(Volgograd)

The principle of procedure consists in artificial endovascular formation of an aseptic necrosis in the hypertrophied muscular bulk, creating LVOT obstruction. Subsequently the formed necrotic focus will resolve into fibrous tissue of smaller volume, thus releasing the outflow from the left ventricle into the aorta.

A total of 10 patients (8 women) underwent this procedure. Their age varied from 43 to 67 years. All patients complained of weakness, decreased physical tolerance, cardiac pains with physical load and even at rest (2 cases), shortness of breath.

Prior to the procedure all patients received ineffective massive conservative treatment.

According to NYHA classification, 7 patients were in class IV, 3 – in class III. The procedure was indicated in cases of: ineffective drug therapy; systolic pressure gradient at rest >40 mm Hg; muscular bulk location predominantly above the aorta; thickness of ventricular septum in the LVOT area ≥ 2 cm.

The procedure was performed in accordance with the standard technique. The ablation was carried out using absolute ethyl alcohol (2-3 ml).

Before and after the procedure we evaluated LV- Ao systolic pressure gradient, the thickness of the ventricular septum, and clinical status of our patients.

As a rule, systolic pressure gradient decreased immediately after the procedure (mean gradient at rest before the procedure 60 ± 10 mm Hg, after the procedure 24 ± 5 mm Hg in most patients). However in 3 cases immediately after the procedure systolic pressure gradient between the LV and the aorta increased by 15-20% on the average. After 3 to 4 weeks the gradient began to drop and during the next 3-6 months decreased by 2-3 times.

Mean thickness of the ventricular septum before the procedure was 2.2 ± 0.8 cm, after the procedure it decreased to 1.4 ± 0.4 cm.

Clinical and functional state of our patients before and after the procedure was as follows:

PECULIARITIES OF PTCA IN THE TREATMENT OF CORONARY ARTERY DISEASE IN THE TRANSPLANTED HEART

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Angiopathy of the heart allograft in view of the absence of afferent innervation develops without pain symptoms specific for ischemic affection and may be manifested clinically as acute myocardial infarction, heart failure or sudden death. In this connection, problems of early diagnostics and correction of coronary arteries lesion gain special relevance.

We present the results of observations of 49 patients (40 males and 9 females aged from 16 to 65 years) who have undergone coronarographic examinations within 9 days up to 15 years after heart transplantation. Angiographic evidence of coronary artery disease in the transplanted heart (CADTH) was revealed in 23 patients. In most cases (17 patients) CADTH was manifested as local one- or multivessel stenosis (type "A"), which was corrected by PTCA (27 procedures were performed). Progressing of CADTH type "C" which is characterized by diffusive obliterating lesion of predominantly distal parts of coronary territory was observed in 6 patients. Performing of adequate revascularization in such situation appears poorly feasible; and in one case CADTH type "C" was an indication for the heart re-transplantation.

PTCA was performed on 42 arteries, and 18 stents, predominantly drug-eluting stents, were implanted. Analysis of the results of endovascular interventions showed that high incidence of consistent effect of balloon dilation and virtual absence of dissections complicating angioplasty were observed in most patients aged over 40 years. Recurrent restenosis even with the use of stents with antiproliferative coating was observed in the majority of young patients (22-29 years), predominantly in females.

PTCA IN THE TREATMENT OF CORONARY HEART DISEASE IN PATIENTS AFTER KIDNEY TRANSPLANTATION

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Coronary heart disease (CHD) is one of the thrilling problems of post-transplantation period and the main cause of death in patients after kidney transplantation (KT). Its rate in the recipients of allogeneous kidneys is 14-20%, which is 3-5 times higher than in general population; in 10, 5% CHD develops for the first time only after KT.

Purpose of study: to evaluate the results and the peculiarities of endovascular myocardial revascular-

ization in patients with coronary heart disease after KT.

Methods: the study comprised 35 kidney recipients (29 men and 6 women), in whom 47 PTCA procedures were performed from 1999 to 2007. Mean age of patients was 39.3 ± 10.4 years. On the average PTCA was performed 81.1 ± 44.3 months after KT. 54% of patients had three-vessel coronary lesion. Endovascular revascularization of the myocardial was performed in maximal possible volume in all patients. Mean duration of follow-up after PTCA was 45 months.

Results: in total we have implanted 56 stents, including 8 drug-eluting stents. Preventive intraaortic balloon pumping was used in two cases because of high risk of intervention. Hospital mortality was 0%. Positive clinical effect was noted after PTCA in all patients, and in 82% of cases it persisted over 12 months. Repeated interventions were performed in 7 patients (20%) because of in-stent restenosis, and in 5 (14.2%) patients more than 12 months after the first PTCA because of progressive atherosclerotic process. We did not reveal significant increase of creatinine level (0.22 ± 0.19 vs. 0.24 ± 0.16 , $p=0.9$) or transplanted kidney dysfunction after PTCA. However a relatively high number of intraoperative complications was noted, which is probably related to the changes in the vascular wall due to the basic disease – coronary dissection requiring additional stenting in 4 patients (11.4%), acute in-stent thrombosis in 2 (5.7%), complications in the puncture area in the form of large hematomas and false aneurysms in 9 patients (25.7%).

Conclusion: PTCA is a rather safe and effective method for CHD treatment in patients after KT. However such patients require enhanced attention in what concerns complications prevention during the procedure as well as during hemostasis after the removal of the instruments from the vessels.

PECULIARITIES OF CORONARY LESIONS IN PATIENTS WITH ACS WITHOUT ST-SEGMENT ELEVATION ON THE BACKGROUND OF METABOLIC SYNDROME

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Purpose of the study: To determine peculiarities of coronary artery lesions in patients with acute coronary syndrome (ACS) without elevation of ST segment and with concomitant metabolic syndrome (MS).

Material and methods: 32 patients with ACS without elevation of ST segment and with concomitant MS (group 1) were examined: 20 males, 12 females, mean age was 56.9 ± 9.7 . Control group consisted of 36 patients with ACS without elevation of ST segment, without MS (27 males, 9 females, mean age 59.06 ± 9.6). Patients were examined in accordance with conventional standards and received treatment

in accordance with international recommendations on management of ACS patients. Coronary angiography was performed in all patients during the first 48 hours from ACS development.

Results: It was determined that multivessel lesion is typical for patients with MS (75% of patients had 2 or more coronary arteries affected). For patients with ACS without elevation of ST segment and with concomitant MS the most typical is occlusive and sub-occlusive coronary artery lesions, which was observed in 84% of studied patients (in the territory of 1 coronary artery – in 43% patients, in 2 territories – in 34% patients, in 3 territories – in 6.25% patients). In MS patients, the most common lesions are revealed in the arteries of medium caliber: middle part of the anterior descending artery (50% of patients); middle part of the right coronary artery, including sharp angle artery (32% of patients); middle part of the circumflex artery, including atrial branch of the circumflex artery (32% of patients). In patients from the 1 group the following was revealed significantly more often than in the control group: affection of 1 diagonal artery (30% of patients in the 1 group and 5.5% of patients in the control group, $p=0.02$), middle part of the circumflex artery (33% of patients in the 1 group and 13.9% of patients in the control group, $p=0.04$), as well as combined affection of the posterior descending artery and distal part of the right coronary artery (30% of patients in the 1 group and 9% in the control group, $p=0.028$).

Conclusion: In patients with acute coronary syndrome without elevation of ST segment and with concomitant metabolic syndrome, the most typical is multivessel occlusive and sub-occlusive lesions of coronary arteries of medium caliber.

COMPARATIVE ASSESSMENT OF CORONARY STENTING WITH “CYPHER” AND “BX SONIC” STENTS, EARLY AND LONG-TERM RESULTS

O.E. Sukhorukov, S.P. Semitko, D.G. Gromov (Moscow)

Purpose of study: comparative assessment and analysis of immediate and long-term results of coronary stenting with drug-eluting «Cypher» stents and bare «Bx Sonic» stents (J&J, Cordis, USA) in patients with IHD.

Material and methods. The study comprised 433 patients with different forms of CHD. All patients were divided into two groups: Group 1 comprised 213 patients in whom 285 «Cypher» stents have been implanted. Group 2 comprised 220 patients with 293 «Bx Sonic» stents implanted. The implanted stents had similar physical and morphological properties and the difference between them concerned only drug-eluting coating (sirolimus) of «Cypher» stents. Baseline clinical, historical and angiographic characteristics were not significantly different between the groups.

Results. Immediate results after endovascular procedure

Index	Group 1 (n=285)	Group 2 (n=293)
Angiographic success of the procedure	283 (99.3%)	289 (98.7%)
Direct stenting	201 (70.5%)	211 (72.0%)
Mean lumen diameter in target area after the procedure (mm)	2.92±0.28	3.02±0.32
Dissection	1 (0.35%)	2 (0.7%)
Occlusion of a significant lateral branch	-	1 (0.3%)
No-reflow effect	1 (0.35%)	1 (0.3%)

Control examination including selective coronary angiography was performed 7±1.8 months after the procedure in 126 (59.2%) patients from Group 1 and 174 (79.1%) patients from Group 2.

Results of control examination	Group 1	Group 2	P
Good results	96.8%	66.5%	$P<0.01$
In-stent stenosis	3.2%	33.5%	$P<0.01$
Late in-stent thrombosis	0.6%	2.6%	NS
MACE	1.9%	4.7%	NS
Deaths	0.6%	0.6%	NS
Repeated PTCA	3.2%	32.5%	$P<0.01$
Restenosis in pts with diabetes mellitus	3.2%	83.3%	$P<0.01$
Restenosis in stents >20 mm in length	1.2%	24.6%	$P<0.01$
Restenosis in stents < 3 mm in diameter	0.6%	22.4%	$P<0.01$
Reocclusion after PTCA of chronic occlusions	0	15.6%	$P<0.01$

Conclusion. Our study showed that the use of stents with drug-eluting (sirolimus) coating gives better results in patients from all age groups, with different forms of CHD, in acute myocardial infarction and unstable angina, as well as in patients with diabetes mellitus, with long lesions, with small vessels lesions, as compared with bare metallic stents.

C-REACTIVE PROTEIN, INFLAMMATION FACTORS AND PREDICTION OF RESTENOSIS DEVELOPMENT

A.B. Sumarokov, M.V. Ezhov, I.R. Raimbekova, V.G. Naumov (Moscow).

We have studied 103 patients with CHD, who underwent myocardial revascularization with PTCA and stenting and compared the data of initial examination with the data of repeated study performed 6-10 months after the intervention.

Inflammation factors – high-sensitivity C-reactive protein, interleukins 6 and 10, tumor necrosis factor (TNF- α), transforming growth factor - β (TGF)- were studied.

Repeated angiography was performed for indications revealed at semi-year examination (objective signs of ischemia). Mean concentration of hsCRP in patients with drug-eluting (Cypher), as well as with

bare stents was within the grey zone limits (<3.0 mg/dl). Taking into account the difficulties with the detection of patients with silent bacterial infection, the subjects with baseline CRP concentration over 10.0 mg/dl were excluded from this analysis.

Comparative analysis of baseline data in two groups of patients (with and without restenosis 6 months after the intervention) shows the absence of significant differences in clinical characteristics (mean age, risk factors for CHD, functional class of angina, aggravated family history, rate of previous MI, indices of lipid and carbohydrate metabolism) between the groups. Tumor necrosis factor (TNF- α) and transforming growth factor - β (TGF) were not significantly changed at baseline, as well as in the long-term. Concentration of IL-6 in the long-term was significantly different in patients with and without formed in-stent restenosis.

Depending on CRP concentration the patients were divided into 3 groups. CRP level was <1.0 mg/dl in 37 (35.2%) patients (subgroup 1), restenosis developed in 5 of them 5 (13.5%), 30 patients (28.5%) had CRP level from 1.0 mg/dl to 3.0 mg/dl (subgroup 2), restenosis was revealed in 6 of them (20%) 6 months after PTCA and CRP level >3.0 mg/dl was noted in 36 (34.9%) patients (subgroup 3), 12 of whom (33.3%) had restenosis, while in 24 (66.7%) patients restenosis was absent by the end of follow-up period. We revealed a tendency for the increase of the rate of restenosis depending on the increase of baseline plasma CRP concentration $\chi^2=3.49$, ($p=0.06$).

Rate of restenosis depending on CRP level ($n=103$).

Index	CRP < 1 mg/dl $n = 37$		1 $>$ CRP < 3 mg/dl $n = 30$		CRP > 3 mg/dl $n = 36$	
	Restenosis (+)	Restenosis (-)	Restenosis (+)	Restenosis (-)	Restenosis (+)	Restenosis (-)
N (%)	5 (13.5%)	32 (86.5%)	6 (20%)	24 (80%)	12 (33.3%)	24 (66.7%)

In patients with restenosis ($n=23$) CRP levels were higher at baseline – 3.0 ± 2.0 mg/dl vs. 2.5 ± 2.5 mg/dl in patients without restenosis ($n=81$), as well as at 6 months. CRP level was higher in restenosis group 3.4 ± 4.8 mg/dl as compared with non-restenosis group 2.8 ± 4.2 mg/dl, while the difference did not reach statistical significance.

Interleukin-6 – a cytokine, stimulating CRP production, showed more pronounced correlations between plasma concentration and the course of the disease during the follow-up period.

Mean values of IL-6 in patients with restenosis, measured in 20 patients, was significantly higher (8.9 ± 8.7 pg/ml) than in patients without restenosis ($n=70$, 3.7 ± 2.8 pg/ml) ($p=0.003$) at baseline as well as in the end of the follow-up period: 5.4 ± 4.9 pg/ml vs. 3.1 ± 3.1 pg/ml, respectively ($p=0.06$).

The analysis of the studied indices of inflammation mediators in the group of restenosis ($n=20$) revealed highly significant relation between the concentrations of CRP and TNF- α – another known stimulator of CRP synthesis – at baseline ($r=0.46$, $p=0.03$), as well as 6 months after PTCA ($n=17$), ($r=0.47$, $p=0.05$).

Conclusion: the estimation of inflammation factors before coronary intervention can be useful for the prediction of in-stent restenosis and justification of pharmacological tactics after the intervention.

ROLE OF ENDOVASCULAR INTERVENTIONS IN COMBINED THERAPY OF SMALL PELVIS TUMORS

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Purpose: to evaluate the effectiveness of endovascular interventions in the treatment of patients with the tumors of small pelvis organs.

Material and methods: the study comprised 384 patients with urinary bladder and uterine cervix tumors, who had been treated in the Departments of Urology and Gynecology in 1991 – 2000 (table). The patients were stratified by sex, age, stage of tumoral process and the degree of concomitant pathology. Table.

Group	Diagnosis		Total
	Urinary bladder cancer	Uterine cervix cancer	
Main	151	118	269
Control	55	60	115

The patients with urinary bladder tumors were treated by traditional methods: transurethral resection, systemic chemotherapy and irradiation. Additionally the patients from the main group received systemo-regional chemotherapy (methotrexate, vinblastine, platinum preparations, adriablastine) and/or embolization of the internal iliac arteries (IIA) branches.

The main method of treatment for patients with uterine cervix cancer consisted in combined intracavitary and distant radiation therapy in accordance with standard schemes. Besides radiation therapy the patients from the main group received regional chemotherapy (cyclophosphan, platinum preparations) and/or embolization of the uterine arteries.

Results: in patients with bleedings from urinary bladder tumors the occlusion of IIA branches resulted in hemostasis in 77% of cases, in patients with uterine cervix cancer – in 97% of cases. Besides, by the day 7-10 regional chemotherapy combined with embolization led to the decrease of exophytic component of uterine cervix cancer, thus allowing for the start of intracavitary radiation therapy. In all cases of bleeding anemia stopped 1-2 weeks after embolization, and the patients could receive radiation and chemotherapy. The survival indices in the main and control groups were not significantly different.

Conclusion: the occlusion of visceral branches of IIA is an effective method of bleeding arrest in most patients with urinary bladder and uterine cervix cancer. The cessation of anemia and the decrease of tumor mass in such cases create favorable conditions for subsequent specific therapy.

ROLE OF ENDOVASCULAR INTERVENTIONS IN THE TREATMENT OF KIDNEY CANCER

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Purpose: to evaluate the effectiveness of endovascular interventions in the treatment of patients with nephrocellular cancer.

Material and methods: the study comprised 478 patients nephrocellular cancer who have been treated in the Department of Urology in 1991 – 2000 (table). The patients were stratified by sex, age, stage of tumoral process and the degree of concomitant pathology Table

Group	Diagnosis		Total
	Kidney cancer		
	Operable	Non-operable	
Main	149	152	301
Control	79	98	177

All patients form the main group underwent oil chemoembolization (ChE) of the renal artery using cytostatic agent emulsion (doxorubicin, vinblastine, dioxadet) in lipiodol and the particles of polyvinylglycol, hemostatic sponge and metallic coils. Subsequently the patients with operable kidney cancer underwent nephrectomy, those with non-operable cancer and metastases underwent systemic hormonal and chemotherapy. In patients form the control groups the kidney was resected without previous ChE, and systemic therapy in cases of advanced cancer was the same, as in the main group.

Results: we revealed a tendency for the decrease of cancer relapse in the group of patients with preoperative ChE – to 12% as compared with 19% in the control group; also an increase of the period without relapses was noted (31 ± 21 vs. 22 ± 19 months, respectively). In cases of non-operable kidney cancer, the ChE of the renal artery gave marked hemostatic and analgesic effect. The bleeding stopped in 84% of patients, and was significantly decreased in the remaining 16%. Pain syndrome was successfully stopped in 70% of cases. No statistically significant difference in 5-year survival was seen between the groups.

Conclusion: preoperative ChE of the renal artery with subsequent nephrectomy leads to the decrease of the number of relapses and the increase of relapseless period. Also ChE has a marked hemostatic and analgesic effect in most patients.

PLACE OF ENDOVASCULAR MYOCARDIAL REVASCULARIZATION IN PATIENTS WITH FORMING HEART ANEURYSM

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Purpose: study of the effectiveness of the delayed percutaneous coronary angioplasty (PTCA) and further tactics of treatment of patients with left ventricular aneurysm (LVA).

Material and methods: we have analyzed early and long-term follow-up of endovascular treatment in 23 patients with postinfarction LVA who underwent PTCA with bare stents implantation into the infarct-related artery. PTCA was performed in few days up to 8 weeks after Q-wave anterior MI (median 4 weeks) – Group I. The control group comprised 23 patients with LVA in whom a waiting strategy was used in anticipation of optimal timing for heart surgery – Group II. After 6 months all patients we performed control ventriculocoronarography, evaluated their clinical status and analyzed further tactics of care. The severity of coronary lesion, at baseline and in dynamics, was assessed using the SYNTAX Score. Local LV contractility was studied on the basis of the index of local contractility disturbances (ILCD) calculated on the base of left ventriculography results.

Coronary angiography revealed “surgical” level (stenosis $\geq 70\%$) of the LAD lesion. According to baseline left ventriculography, global contractile function of the LV myocardium was decreased in all patients, with average LV ejection fraction (EF) values of 36.1% in Group 1 and 42.9% in Group2 ($p > 0.05$); also all of them had the signs of postinfarction LVA. Long-term follow-up was studied on the base of clinical data, the results of ventriculocoronarography, the SYNTAX Score, and ILCD.

Results: in the long-term follow-up clinical picture of angina was absent in 12 patients in Group I (52.2%), stable angina was noted in 10 patients (43.5%), and only 1 patient had clinical symptoms of unstable angina (4.3%). At the same time in the control group 3 patients (13%) were angina-free, 18 (72%) had stable angina, and in 2 patients unstable angina was diagnosed (8.7%).

Dynamic studies revealed the improvement of global LV contractility in Group I patients. Mean value of LVEF rose from 34.3% to 47.2% ($p < 0.05$). We noted a tendency for LVEDV decrease from 197.6 to 182.8 ml ($p = 0.04$). At control examination LVESV decreased from 129.4 ml to 111.3 ml ($p = 0.006$). The patients receiving conservative therapy after MI (Group II) had global LV contractility significantly below the normal values both at baseline and at control examination (42.9%, and 40.7%, respectively, $p > 0.05$); the value of LVEDV remained high both at baseline and at control examination (213 ml and 218.8 ml ($p = 0.4$). At the moment of control examination 30.4% of patients ($n = 7$) in Group I (after PTCA) had no direct indications for myocardial revascularization of LVA resection, reintervention was judged useful in 2 patients (8.7%), 9 patients (39%) required surgical CABG or CABG with LVA resection, while isolated LVA resection was performed in 4 patients (17.4%). In Group II 100% patients had indications for surgical CABG or CABG with LVA resection at the moment of control examination.

Conclusion: delayed PTCA is a method of myocardial revascularization producing a favorable impact on the indices of intracardiac hemodynamics, and can be used in patients with LVA as a stage of surgical treatment and in some cases – as an independent method of treatment.

SELECTIVE SALPINGOGRAPHY AND RECANALIZATION OF UTERINE TUBES IN PATIENTS WITH TUBAL INFERTILITY

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Purpose: analysis of diagnostic and therapeutic possibilities of selective salpingography (SSG) and transcatheter recanalization of uterine tubes (TR UT) in patients with tubal infertility.

Material and methods. From 1993 to 2007 we have investigated 180 women aged 21 to 42 years with previously diagnosed proximal impermeability of both or a single UT and average infertility duration of 4.5 years. The procedure was performed in out-patient settings and consisted of the following stages: 1) repeated GSG; 2) in cases of re-confirmed proximal impermeability of the uterine tubes – SSG; 3) in cases of ineffective SSG – TR UT.

Results. Repeated GSG did not confirm UT impermeability in 34 women (19%), 23 out of them got pregnant within one year (68%). SSG allowed to visualize UT in 50 patients (28%), within 12 months 18 out of them (36%) got pregnant. TR UT was successful in 84 out of 96 patients (88%), pregnancy rate was 23% (n=19) and depended on the state of distal UT segments and the age of women. In total, combined usage of GSG, SSG and TR UT resulted in pregnancy in 60 out of 180 women (33%); in 57 cases (32%) the pregnancy ended with normal parturition.

Conclusions. SSG and TRUT play an important role in examination and treatment of patients with infertility: they can be considered as the methods of precisizing diagnostics of uterine tubes' state and permeability and give the women real chances for normal childbearing and parturition.

PERSPECTIVES OF THE USE OF AUTOLOGOUS AND ALLOGENIC MESENCHYMAL STEM CELLS AND DERIVED CARDIOMYOCYTES PRECURSOR CELLS IN CARDIOLOGY

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Over the last years, interest to the use of stem cells of adult organism in different fields of medicine and especially for tissue lesions of two "target" organs – heart and brain – has been increased sharply. In experiments on animals and pilot clinical studies it was shown, that mesenchymal stem cells and in vitro derived cardiomyocytes precursor cells have the greatest potential in the treatment of heart diseases of different nature.

It is associated with high plasticity of mesenchymal stem cells and their ability to significantly intensify reparative processes in tissues of affected cardiac muscle due both to own proliferation and differentiation and to paracrine effect transforming to the proliferation resting stem cells of the adult organism in affected tissues.

Experimental studies conducted in our Center allowed us to get license from Federal Control Service in Health Care and Social Development of the Russian Federation for the method of growing of autologous cultures of mesenchymal stem cells and derived cardiomyocytes precursor cells (cardiomyoblasts). On this basis, clinical studies of the method of system transplantation of autologous stem cells in heart failure of different genesis have been initiated in our Center. Obtained preliminary results are suggestive of safety and efficacy of the new method of cell therapy in cardiology.

Relevant problems concerning new technology: indications and contraindications for the use of this type of stem cells, combination of system transplantation with conventional treatment methods, other ways of administration of stem cells (endocardial, into coronary vessels, etc.), the use of agents which able to activate "microenvironment" of transplanted and resident stem cells and several others, as well as the problems of possible extension of studies in this field and cooperation with interested participants, will be discussed in the report on our own and literature data.

ENDOVASCULAR TREATMENT OF PATIENTS WITH VASORENAL HYPERTENSION

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Purpose: to study early and mid-term effectiveness of renal arteries (RA) stenting in patients with vasorenal hypertension.

Material and methods: we have studied 95 patients with atherosclerotic lesion of the renal arteries, in whom 105 stenting procedures have been performed. At baseline all patients had arterial hypertension (AH) of different degree (according to WHO classification), kidney function was decreased in 21 (22.5%) patients.

Results: stenting was successful in 104 cases (99.0%), in 1 case (1.0%), the procedure was complicated by occlusive dissection, which necessitated urgent surgical intervention.

The data of 24-hours monitoring confirmed immediate hypotensive effect after the procedure in all patients ($p < 0.01$).

We studied mid-term results of 50 procedures in the RA of 45 patients. The average duration of the follow-up was 8 ± 2.6 months. In-stent stenosis was revealed in 4 cases (8.0%), these patients underwent endovascular correction with good effect. Stent occlusion wasn't revealed in any case. Primary hypotensive effect was preserved in

73.2% of cases ($p < 0.01$). The most marked effect was noted in patients with 3rd degree hypertension, with hypertension duration ≤ 5 лет, without the signs of pronounced nephrosclerosis (as judged by US Dopplerography of the segmental arteries). The amount of taken hypotensive agents significantly decreased ($p = 0.0007$), the effectiveness of hypotensive therapy increased as compared with the baseline.

Excretory kidney function improved in 32% of cases, the deterioration was noted in 10% of cases, in the remaining patients kidney function was not significantly changed.

Conclusions:

1. Stenting is a highly effective method for the treatment of atherosclerotic lesions of the renal arteries, leading to hypotensive effect and the improvement of kidney function in the majority of cases. The rate of in-stent stenosis in the mid-term follow-up is 8.0%.
2. The main predictors of clinical effectiveness of endovascular treatment of patients with vasorenal hypertension are: AH duration ≤ 5 лет, arterial hypertension of 2nd-3rd degree, absence of nephrosclerosis signs.

RESULTS OF THE TACTICS OF EARLY INTERVENTIONAL AND EARLY CONSERVATIVE OF TREATMENT OF PATIENTS WITH ACS WITHOUT ST ELEVATION IN THE PRESENCE OF RISK FACTORS

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Purposes: study of the effectiveness of early interventional and early conservative treatment of patients with ACS without ST elevation in the presence of high risk signs at admission. The patients with early postinfarction angina on the background of Q-wave myocardial infarction were excluded from the study.

The study comprised 62 patients (48 men and 14 women) aged 41 to 77 years admitted for urgent indications with ACS. All patients received standard treatment: IV heparin with subsequent transfer to subcutaneous heparin or low-molecular weight heparin, aspirin 100-325 mg/daily, IV nitroglycerin with subsequent transfer to peroral administration, ATF inhibitors, β -blockers, blockers of Ca channels and statins if indicated. Prior to intervention patients were administered a loading dose of clopidogrel (300 mg) with subsequent transfer to 75 mg daily in cases, when PCI was performed within the nearest hours or was supposed to be performed within the next 24 hours. Integrilin or other agents from IIb/IIIa blockers group were not used in any of patients. The available stents from different manufacturers were implanted in 61 patients.

The patients were divided into 2 groups as follows: Group 1 ($n = 31$) – early interventional tactics of

treatment (coronary angiography and stenting within the first 24 hours); Group 2 ($n = 31$) – early conservative tactics of treatment (coronary angiography and stenting performed within 2 to 24 days). Among Group 1 patients 9 had first onset angina, 10 – progressive angina, 12 – non-Q-wave MI. Among Group 2 patients 9 had first onset angina, 19 – progressive angina, and 3 – non-Q-wave MI.

Occlusions were revealed in 10 patients from Group 1; in 8 of them the cause-related arteries were occluded, however only 3 patients had a history of MI. In Group 2 patients there were 12 occlusions, including 7 cause-related, 7 patients with occlusions had a history of MI. In total, history of MI was present in 9 patients from Group 1 and in 8 patients from Group 2. Single-vessel lesion was present in 7 patients from Group 1 and in 13 from Group 2, two-vessels – in 9 and 5, respectively, three- and more vessels lesion – in 16 patients from Group 1 and in 12 patients from Group 2. Good angiographic results were achieved in all patients, the revascularization at TIMI-3 level was performed in 58 patients, at TIMI – 2 level – in 4 (due to more distal stenoses, which were not stented because of the lack of indications). Myocardial infarction developed in 4 patients from early interventional tactics group, 3 among them had Q-wave MI before the intervention and the fourth had a non-Q-wave MI after PTCA and stenting, because of the thrombosis in the artery in which no PCI was performed. In the group of early conservative tactics myocardial infarction occurred in 8 patients; all of them underwent urgent intervention, during the treatment the diagnosis of Q-wave MI was made in 1 patient, and of non-Q-wave MI – in 7. EF in Group 1 increased by 11.75% in 8 cases, in Group 2 – by 10.37%, also in 8 cases. Post-intervention angina was present in 2 cases, both patients had multi-vessel disease. No deaths were observed among patients who underwent interventions for UA/non-Q-wave MI. In 1 case we observed a large hip hematoma requiring blood transfusion or surgical intervention.

Hence, in patients from conservative tactics group there were significantly more myocardial infarctions requiring thrombolytic therapy as well as urgent revascularization. EF increase after the intervention was observed in total in 16 patients, among them – in 8 patients from early intervention group, in cases when there were signs of collateral blood flow in the presence of occlusion.

RESTENOSIS AFTER BARE METALLIC STENTING IN DIFFERENT SEGMENTS OF THE CORONARY ARTERIES

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The use of stents with polymer drug-eluting coating significantly broadens the possibilities of interventional cardiology. Meanwhile in-stent stenosis

in the long-term after the procedure remains an adverse effect. It is observed with different rate of occurrence with the use of bare metallic, as well as of drug-eluting stents.

Purpose of study: to evaluate the degree of restenosis after endovascular stenting with matrix bare metallic stents in different segments of the coronary arteries.

Material and method: we analyzed immediate and long-term results of coronary stenting in 570 patients in whom 602 stents were implanted into the native coronary artery for primary atherosclerotic stenosis. All patients were divided into 3 groups" Group 1 – the left main coronary artery and proximal segments of the RCA, LAD, Cx; Group 2 – middle segments; Group 3 – distal segments of the above coronary arteries. Immediate results (angiographic and clinical success), the presence of complications (death, AMI), as well as long-term results (aggravation of CHD, in-stent stenosis, AMI in the territory supplied by the stented coronary artery, subsequent CABG, repeated coronary intervention on the target vessel) were evaluated. The diagnosis of re-stenosis was based on clinical data, stress tests and the data of control coronary angiography performed after 6 to 12 months.

Results: immediate angiographic success was achieved in 99.5% of cases. Optimal result was not obtained in 3 cases because of: no-reflow effect (1), occlusion of a large lateral branch and AMI (2). Clinical effectiveness (absence of angina or decrease of its functional class) was 98.2% in Group 1, 99% in Group 2, 97.6% in Group 3. Control coronary angiography was performed in 310 patients, that is, in 54.4% of all stented patients. The rate of restenosis in Group 1 was 34.7%, in Group 2 – 8.65%, in Group 3 – 28.6%.

Conclusions: the use of matrix bare metallic coronary stents is a safe and effective method for endovascular treatment of CHD in atherosclerotic lesion of the native coronary arteries. The rate of in-stent restenosis after the implantation of drug-eluting stents, by different authors, is 6-9%, which is quite comparable with the rate of in-stent stenosis after stenting of the middle segments of the coronary arteries with bare metallic stents (8.5%). Hence, in certain cases it is possible to use bare metallic stents and avoid the use of expensive drug-eluting stents.

RHEOLYTIC THROMBECTOMY IN THE TREATMENT OF VENOUS THROMBOSIS

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From 2005 to 2007 the system Jet-9000 for rheolytic thrombectomy with various modifications of catheters was used in 15 patients with major veins thrombosis of different localizations. Intervention for the thrombosis of iliofemoral segment was done in 4

(27%) patients, for massive pulmonary thromboembolism – in 2 (13%), for thrombosis in the superior vena cava system – in 6 (40%), and for occlusion of infrarenal segment of the inferior vena cava after cava-filter (CF) implantation – in 3 (20%) patients. In cases of stenotic lesions of the venous bed endovascular intervention was finished by balloon angioplasty with further stenting of involved vascular segments in 5 patients. Rheolytic thrombectomy was complemented by a course of thrombolytic therapy in 3 patients with subclavian vein thrombosis.

Absolute effectiveness of rheolytic thrombectomy in venous thrombosis was shown in 66.7%, partial effect was achieved in 26.7% and in 6.7% the results of endovascular intervention were unsatisfactory.

Any severe complications during rheolytic thrombectomy didn't occur, only transient hypotension and bradycardia were noted. Insignificant hematuria was seen after the procedure. One patient died in early postoperative period, and this death was related to critical increase of cardiopulmonary decompensation due to massive pulmonary embolism, despite almost complete restoration of the blood flow through the pulmonary artery.