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Address of the Editions:
101000, Moscow,
Sverchkov per., 5
Phone: (095) 924 96 36
Fax: (095) 924 67 33

Head of Editorial Office:
E.D. Bogatyrenko

Scientific editor of translations:
D.G. Iosseliani

Translation:
SWAN, NPO-Astek

Original layout prepared by:
A. Aksuk, V. Shelepukhin

Computer type-setting and make-up:
D. Jagowkin

Corrector:
N. Sheludiakova

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Prof. David G. Iosseliani,
Editor-in-Chief,
International Journal
of Interventional Cardioangiology,
Sverchkov per., 5,
Moscow, 101000, Russia.
Fax: (7-095) 924 67 33
e-mail: davigdi@caravan.ru

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International Journal
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Moscow, 101000, Russia.
Fax: (7-095) 924 67 33
e-mail: davigdi@caravan.ru

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Russian Society of Interventional Cardioangiology

Russia, 101000, Moscow, Sverchkov per., 5.

Moscow City Center of Interventional Cardioangiology

(for the Secretary of the Society)

Phone.: (7-095) 924-96-36, 924-47-18.

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FURTHER CONFIRMATION OF THE EFFECTIVENESS OF DRUG-ELUTING STENTS (ANALYSIS OF THE RESULTS OF "REAL PRACTICE" REGISTRY OF THE USE OF "CYPHER" STENTS)

A.M. Babunashvili, D.P. Dundua, D.S. Kartashov, Z.A. Kavteladze (Moscow)

Purpose of the study: To assess the efficacy of sirolimus-coated stents (SCS) 6 and 12 months following their implantation considering the baseline findings at coronary angiography.

Materials and methods: A total of 426 SCS were implanted to 351 patients. Of these, 331 patients had unstable angina, and 20 - AMI. Follow-up coronary angiography was obtained in 163 patients. Restenosis risk groups were assessed separately. There were two risk groups: 1) angiographic risk (96 patients), which included bifurcational stenoses, prolonged lesions (>25 mm), ostial lesion, occlusions over 3 months in duration, left main stenosis, coronary restenosis, <2.74 mm arterial diameter, and 2) clinical risk, which included 29 patients (AMI, diabetes mellitus, unstable angina).

Results: Restenosis was confirmed by angiography in 10 patients (6.1%). Of these, only 2 patients (1.2%) developed in-stent restenosis, and 8 patients (4.9%) - in-segment restenosis. One patient (0.28%) developed AMI one month after LAD stenting with SCS using a "T-stenting" technique. The rate of restenosis at 12 months was 6.8%. No deaths occurred, 1-year MACE-free survival was 99.7%. Repeated myocardial revascularization was performed in 4.9% of patients.

As demonstrated by digital subtraction angiography, mean in-stent restenosis was 11.28±2.3%, mean restenosis at the proximal end of stent - 28.54±9.67%, and mean stenosis at the distal end of stent - 10.56±5.54%. Angiographic restenosis was found in 8 patients of the first (angiographic) risk group (8.3%) vs 2 patients in the second group (6.9%).

Conclusion: Sirolimus-coated stents exhibit low rate of restenosis and repeated myocardial revascularization in the early period (6 months) and in the long term period (12 months) postoperatively despite the high prevalence of angiographic and clinical restenosis risk patients.

EARLY AND MID-TERM RESULTS OF CORONARY STENTING WITH DRUG-ELUTING STENTS

D.G. Iosseliani, S.P. Semitko, O.E. Sukhorukov (Moscow)

Purpose: to study the immediate and mid-term results of coronary stenting with drug-eluting stents Cypher (Cordis, Johnson and Johnson, USA).

Material and methods: the study enrolled 80 patients (67 men), in whom 101 drug-eluting stents were implanted between September 2002 and October 2004. All patients had different class of angina pectoris, 10% of them had unstable angina

Coronary artery	N of stents	%
LAD	59	58,4
RCA	20	19,6
CxB	16	15,6
OMA	3	2,8
DA	2	1,8
Intermediate	1	0,9
AV bypass to RCA	1	0,9

Stenting was performed in accordance with the adopted procedure. In 56,4% of cases stents were implanted directly, and in the others stenting was performed following PTCA. In 19,8% of cases total chronic occlusion of target vessel was encountered, which necessitated prior mechanical recanalization and PTCA. In 58,4% of cases RIVA was stented, in 19,6% - RCA and in 15,6% - the circumflex artery. Yet in 2,8% the obtuse margin branch was stented. Mean stent diameter was 2,86 mm, mean stent length - 18,35 mm. After the discharge all patients received Ticlide (500 mg/day) or Plavix (75 mg/day) for 60 days. Follow-up coronary angiography was performed at 6 months.

Results: the procedure was successfully performed in 100% of cases. In 2,5% of cases (2 patients) the degree of stent "deployment" was controlled with IVUS device (Jomed). In one case (0,9%) stent thrombosis was revealed in early post-procedure period (day 4).

Control coronary angiography was performed in 22 (27,5%) patients with 27 (26,7%) implanted stents after 8±1,7 months in average. In 15 (88,2%) patients no signs of restenosis were revealed. In one female patient (5,9%) there was an "in segment" stenosis above the implanted stent, which required the implantation of an additional stent. In one case (5,9%) an AV graft (to RCA) with previously implanted "Cypher" stent was occluded.

Conclusions: coronary stenting with "Cypher" stents (Cordis) is an effective method of treatment of atherosclerotic coronary lesions and is accompanied by low rate of restenosis.

SIROLIMUS AND PACLITAXEL - HOSPITAL OUTCOME OF THE IMPLANTATION OF STENTS WITH ANTI-PROLIFERATIVE COVERING

I.V. Levitzky, I.V.Pershukov, T.A. Batyraliev, B. Tiriaki, Z.A. Niyazova-Karben, Sh. Zhamgyrchiev, A.N.Samko (Moscow, Voronej, Gaziantep)

Purpose of the study was to perform a non-randomized comparison of hospital results between two types of stents with different drug coating.

Materials and methods: A total of 1198 drug-eluting stents were implanted to 922 patients in 3 different centers between 2002 and September 2004. Seventy eight (78) AXXION stents with paclitaxel covering (OCCAM) were implanted to 63 patients, and 859 patients received 1120 Cypher stents (Cordis) with sirolimus covering. Among the 1998 patients there were 982 men and 216 women, mean age was 59±9 years. The stents were deployed in arteries 2.4 to 4,2 mm in diameter. Stent diameter was 2.5 mm, 3.0 mm, 3.5 mm and 4.0 mm. Stent length ranged from 8 to 33 mm. All patients received antithrombotic therapy with aspirin 75-325 mg daily and plavix 300 mg daily prior to stenting and 75 mg daily for at least 4 weeks following stenting.

Results: The entire 100% of interventions were successful, control angiography after the completion of procedure revealed TIMI 2 or 3 blood flow in the stenting area, there was 0 to 25% residual stenosis (mean 11±7%). No acute or subacute stent thrombosis was observed during hospital stay. 14% of AXXION stents and 16% of Cypher stents were implanted to patients with acute coronary syndrome. In addition, ACS patients received integrilin, agrastat or ReoPro. All patients were discharged from the hospital with no unfavorable events after stenting.

Conclusion: Hospital results with two stents with antiproliferative covering were comparable. Long-term assessment is needed for complete evaluation of various drug coatings' potential.

HOSPITAL AND LONG-TERM OUTCOME OF SIROLIMUS-COATED "CYPHER" STENT

B. Tiriaki, I.V. Levitzky, I.V.Pershukov, Sh. Zhamgyrchiev, A.N.Samko, Yu.A. Karpov (Moscow, Voronej)

Purpose of the study was to assess the hospital and long-term results of Cypher stent implantation.

Materials and methods: From 2002 till September 2004 we surveyed 420 procedures of "CYPHER" stent implantation in 344 patients. Mean age was 57.8±7.9 years. There were 22% of women. Diabetes mellitus was found in 11% of patients. Positive bicycle ergometry test was observed in 68% of patients, whereas in 25% the test was not informative, and in 7% of patients the bicycle ergometry results were negative.

Stent diameter ranged from 2.25 mm to 4.0 mm (mean 2.94±0.54 mm). Stent length was 8 to 33 mm (mean 15.4±6.3 mm). All patients received antithrombotic therapy with Aspirin 75-325 mg daily. The majority of patients received Plavix 75 to 300 mg before stenting and 75 mg during 4 to 52 weeks following stenting (mean 17±14 weeks), while 6 patients were administered Ticlid 500 mg daily during 4 to 24 weeks (mean 14±6 weeks).

Results: The entire 100% of interventions were successful, control angiography after the completion of procedure showed TIMI 2 or 3 blood flow, there was 0 to 22% residual stenosis (mean 10±6%). No cases of acute or subacute stent thrombosis were

observed during hospital stay. Sixteen per cent of Cypher stents were implanted to patients with acute coronary syndrome. In addition, the ACS patients received Tirofiban or Abciximab. All patients were discharged from the hospital without any unfavorable events after stenting.

Long-term assessment at 64-457 days (mean 226±80 day) in 43 patients revealed 50% to 70% restenosis in the border stent's segment in 2 patients.

Conclusion: Stenting with Sirolimus-coated Cypher stents is effective and safe in the large majority of patients.

CORONARY STENTING WITH "CYPHER" STENTS: CHANGES IN TECHNICAL APPROACHES AND REAL POSSIBILITIES TO IMPROVE THE RESULTS OF ENDOVASCULAR TREATMENT OF CAD

A.N.Savchenko, P.A. Bolotov, B.A. Rudenko, Yu.G. Matchin, N.V. Nudnov, K.A. Savostianov, O.V. Cherkavskaya, E.V. Chernova, N.M. Danilov, E N. Khorikova (Moscow)

Purpose of the study: to assess the efficacy and long-term results of endovascular therapy of different forms of coronary heart disease with Cypher stent compared to Bx Velocity stent, which has no drug-eluting coating.

Materials and methods: we analyzed the immediate and long-term results of coronary stenting in 738 patients. The patients were divided between 2 groups: group 1 consisted of 376 patients, who underwent endovascular implantation of 490 Bx Velocity or Bx Sonic coronary stents. Group 2 included 362 patients, in whom 482 Cypher stents were implanted. The following subgroups were analyzed separately: coronary occlusion, bifurcational lesions, diffuse lesions, small diameter vessels, interventions performed for restenosis or graft stenosis. We assessed technical approach, immediate results (angiographic success, clinical outcome) and complications, as well as the long-term results (CAD progression, in-stent restenosis, in-segment restenosis, death, AMI, coronary bypass grafting, repeated endovascular treatment of the target vessel). Diagnosis of restenosis was based on clinical manifestation, positive stress test and follow-up coronary angiography (CA). Follow-up CA was performed in 36% patients. Follow-up duration was 6-18 months.

Results: The immediate success of stenting was 100% in both groups. Effective delivery, accurate positioning and complete controlled expansion of stents were observed. Difficult introduction of stent-system due to arterial tortuosity or calcification was encountered with stents over 28 mm in length and necessitated predilation or implantation of several shorts stents in 5 patients. Clinical efficacy of stenting in group 1 (complete or partial reduction of angina, negative stress test) was 97.6% vs 96.8% in group 2. There were no complications, AMI or death during the intervention or postoperatively in both groups. Further survey showed the rate of angina recurrence or progresion in group 1 to be 11.7% vs 0.67% in group 2. We found general decrease of coronary events' rate by 65.8% with Cypher stents. Follow-up during 12-18 months demonstrated most significant reduction of the risk of coronary events with Cypher stents in the following subgroups: de novo lesions - by 67.3%; diffuse lesions - by 83.5%; coronary occlusion - by 83.5%. The use of Cypher stents has changed technical approaches towards more active stenting of bifurcational lesions, as well as stenting with several stents for diffuse lesions or prolonged occlusion. Total rate of repeated endovascular interventions in groups 1 and 2 was 6.6% and 1.6%, respectively.

Conclusions: The use of Cypher stents significantly improves clinical outcome of endovascular therapy for CAD of any type. Follow-up during 12-18 months demonstrates significant decrease of the rate of clinical coronary events with Cypher stents as compared to Bx Velocity stents, as well as reduction of the need for repeated endovascular intervention. The most important benefits of Cypher stent were revealed for new technical approaches to stenting of diffuse lesions, coronary occlusions after recanalization, bifurcational lesions, arteries below 2.75 mm in diameter.

IS THERE ANY DIFFERENCE IN RE-STENOSIS MORPHOLOGY AFTER THE IMPLANTATION OF DRUG-ELUTING AND BARE STENTS?

I.V.Pershukov, A.N.Samko, T.A. Batyraliev, Z.A. Niyazova-Karben, L.N. Petrakova, M.K. Peresypko (Moscow, Voronej)

Purpose of the study was to compare morphological profile of restenosis between drug-eluting and bare stents.

Materials and methods: We followed 526 patients with in-stent restenosis after bare stent implantation between 1997 and 2004. In addition, between 2002 and 2004 we obtained information of flow-limiting restenosis in sirolimus-eluting and paclitaxel-eluting stents in 5 patients. In-stent restenosis was identified within 9 months after bare stent implantation and within 24 months after drug-eluting stent implantation.

Results: According to morphological restenosis scale (IRGCIC), the in-stent restenosis was found in 38% of patients, borderline restenosis - in 54% of patients, and total restenosis - in 8% of patients after bare stent implantation. In 62% of patients the in-stent restenosis after bare stent implantation was localized (below 10 mm), while in 38% of patients it was diffuse and proliferative, exceeding the length of 10 mm. No cases of complete occlusion were observed after drug-eluting stent implantation and the restenosis developed only at the stent border extending mostly to the non-stented arterial segments. In all 5 cases restenosis was focal and below 10 mm in length.

Mean restenosis rate for bare stents was 78±11% vs 69±6% for drug-eluting stents.

Conclusion: Stents with antiproliferative drug of extended release ensure prolonged patency, leading in rare instances to borderline persistent restenosis, unlike bare stents. We found, that restenosis after drug-eluting stent implantation was focal and didn't result in complete occlusion of the vessel.

PROPHYLACTIC STENTING WITH "CYPHER" STENTS. LONG-TERM FOLLOW-UP.

A.L. Krylov, V.I. Varvarenko, S.G. Goltzov, V.V. Markov (Tomsk).

Purpose of study: to evaluate risk factors for in-stent and edge hyperplasia after the implantation of Cypher stents ("Cordis",USA).

We have studied the lumen dynamics of 72 stents at control coronary angiography at 11±1,2 months after the implantation. The indice of neointimal hyperplasia - the loss of stent lumen (LSL) was calculated as the difference between diameters of the stent (Dst) and arterial lumen inside the stent (DA):

LSL = Dst - DA (mm)

Edge restenoses were revealed only in cases of stent edges implantation into the atherosclerotically changed segments of coronary arteries. In 8 (17,4%) out of 46 cases of such stent localization the degree of coronary artery narrowing at the stent edges rose from 26±6,2% to 65,1±4,2%. In 4 out of 8 cases edge dissection was revealed.

In order to prevent edge restenoses 34 stents of 23,5±1,2 mm length and 3,02±0,14 mm diameter were implanted in conformity with the principle "from one normal segment to another". LSL was studied in the site of stented hemodynamically significant stenosis and in the segments with diffuse lesion. "On stenosis" LSL was 0,35±0.04 mm - 11,5% of stent diameter. In the diffusely changed segments LSL was 0,27±0,03мм - 8,9%.

The main risk factor for neointimal hyperplasia consisted in residual restenosis, with LSL of 0,55±0,07 mm. With this 3 out of 5 hemodynamically significant "in stent" restenoses were revealed in the site of residual stenosis. One out of 5 "in stent" restenoses was formed in the area of diffuse lesion of the stented segment.

Thus, the implantation of stent edges into the damaged segments of coronary arteries represents risk factor for edge restenoses. The rate of restenoses in such cases can exceed the amount of "in stent" by several times. The stenting with long stents with antiproliferative coating "from one normal segment to another" solves the problem of hemodynamically significant stenosis as well as of adjacent diffusely changed segments. So, to our opinion, such approach is the base for preventive trend in PTCA.

BIODEGRADABLE POLYMER-COATED PACLITAXEL-ELUTING STENTS (CHOPIN 3 OF BALTON) IN THE PORCINE CORONARY MODEL- QCA, IVUS IN VIVO AND IVUS EX VIVO EXAMINATION.

P. Buszman, K.Milewski, M. Abu Samra, A.Zurakowski (Katowice, Poland)

Several drug eluting stents with polymer and paclitaxel have been under preclinical and clinical investigation and produced different outcomes. It has been depended on their stent platforms, their drug delivery and release concepts and obviously on their total drug concentration. We wanted to evaluate biodegradable polymer (poly lactic acid)-coated paclitaxel-eluting stents (Chopin 3 of Balton) and to compare the results of IVUS performed in vivo and ex vivo.

Methods: Six domestic pigs weighing from 35 to 40 kg were included in the study. Three days prior to the procedure we administered 500mg of Ticlopidine and 150mg of Aspirin and continued this therapy for 28 days. During the procedure each animal received 100mg/kg of heparin and NTG. Under intravenous anesthesia we punctured one of the femoral arteries and inserted a standard 6F introducer sheath. Then we used JR4 and Amplatz R-L guiding catheters. Six stainless steel (Chopin 2 of Balton) stents (SS), 6 polymer coated stents (PLA) and 6 Chopin 3 (3x15mm), were deployed into one of three main coronary arteries segments under QCA control. Each stent was implanted under such pressure so that the proportion of a dilated stent to the vessel equaled 1,15:1,0 - 1,2:1,0. On the 28th day after the procedure a control coronarography and IVUS examination was performed. Then, all animals were sacrificed, the arteries with stents were isolated and flushed with heparin solution and with 10% Zn-buffered formalin under the pressure of 100mmHg to perform further ex vivo IVUS analysis.

Results: All vessels were patent after the implantation and after 4 weeks. No acute or late thrombosis was observed. On basis of QCA analysis we found statistical lower LL in Chopin 3 subgroup (0,08±0,09 for Chopin 3 vs 0,48±0,13 for SS and 0,87±0,39 for PLA; ANOVA; p=0,02) and also lower %DS in Chopin 3 supgroup (8,43 ±3,01 for Chopin 3 vs 18,57 ±2,81 for SS and 26,32 ±7,51 for PLA p<0,05). In vivo IVUS examination demonstrated significantly smaller NI area, LL and %DS in Chopin 3 in comparison to SS and PLA subgroup:

However, further analysis revealed discrepancy between IVUS performed in vivo and ex vivo. There were statisticaly significant differences in NI area, %DS and LL in Chopin 3 subgroup but no differences were observed in SS and PLA subgroups:

IVUS in vivo				
	SS	**PLA**	**Chopin 3**	**P**
NI area	3,12 ±1,44	2,88 ±0,84	0,90 ±0,28	P<0,05
LL	0,59 ±0,16	0,64 ±0,21	0,19 ±0,05	P<0,05
% DS.	21,59 ±2,26	26,59 ±6,47	12,03 ±1,80	P<0,05

In that case we compared these results with quantitative coronary angiography and we found convergence between QCA and IVUS performed in vivo and statistical significant difference between QCA and IVUS ex vivo (p<0,05).

NI area (mm2)		**LL**		**% DS**	
ex vivo	in vivo	ex vivo	in vivo	ex vivo	in vivo
2,25 ±0,96	0,90 ±0,28	0,47 ±0,10	0,19 ±0,05	21,92 ±4,0	12,03 ±1,80
p=0,008		p=0,002		p=0,0002	

Conclusion: Chopin 3 effectively reduced development of in stent neointimal hyperplasia assessed by QCA and IVUS in vivo. The discrepancy in results obtained in IVUS may indicate swelling of neointima by interaction between formalin and paclitaxel and need to be explained in further histopathological examination.

«PTCA in High Risk of Complications of Interventional Procedures»

HIGH-RISK ANGIOPLASTY

A.M. Babunashvili, D.P.Dundua, D.S.Kartashov, G.Yu. Travin, Z.A.Kavteladze (Moscow)

Purpose of study: to evaluate the feasibility, the effectiveness and the safety of PTCA in patients with high risk of intervention.

Material and methods: from 1998 till 2004 PTCA was performed in 154 aged 47-78 years (mean age 60.4 2.4 years) fulfilling the criteria of high risk. We determined the following criteria: 1. PTCA of "unprotected" LCA; 2. PTCA of "single" remaining artery or of the artery supplying the major portion of viable myocardium; 3. The presence of complicated lesions (ACC/AHA classification) in such arteries; 4. Combination of one or several of the above signs with unstable angina (UA) and/or AMI. Unstable angina of III-IV functional class (CCS) was present in 112 out of 154 patients, 42 patients presented with UA and/or AMI. In 65 patients (42.2%) PTCA was accompanied by the use of IIb/IIIa receptors inhibitors, in 23 - by intraaortic counterpulsation. PTCA was conducted in 186 arteries (among them there were 148 stenotic and 38 occluded arteries). Stenting was performed in all cases (a total of 217 stents was implanted). 186 arteries were distributed as follows: main LCA - 43 (23.1%), LAD - 86 (46.2%), RCA - 34 (18.3%) and CxA and its branches - 23(12.4%). Diabetes mellitus was present in 23 patients (14.9%), renal function was disturbed in 7 patients (4.5%).

Results: hospital mortality was 4.5% (7 patients). In the long-term follow-up 3-year survival was 78.6%, repeated revascularization was carried out in 44.2% (61 patients). 77 patients (55.8%) remained angina-free. The main risk-factors for MACE in the long-term follow-up are: 1. long lesions (r=0.97), 2. diabetes mellitus (r=0.88), 3. decreased left ventricular ejection fraction (r=0.96). The age of patients and the localization of the lesion didn't influence immediate and long-term results. The analysis of results in the groups of patients receiving and not receiving IIb/IIIa receptors inhibitors didn't reveal any significant dependence between this drug use and immediate or long-term results (p=0.45).

Conclusion: PTCA in high-risk patients is a feasible, safe and effective procedure. However, one has to be careful when determining the indications for PTCA in patients with diabetes mellitus, decreased left ventricular ejection fraction and long coronary lesions, or with combination of those criteria.

RESULTS OF PTCA IN PATIENTS AFTER ORTHOTOPIC HEART TRANSPLANTATION

E.V.Merkulov, I.V. Levitzky, A.V. Sozykin, S.L.Dzemeshkevich, A.N.Samko (Moscow)

Autoimmune processes in patients after orthotopic heart transplantation are the main cause of coronary artery stenosis. Eight patients, who had underwent orthotopic heart transplantation, were followed up between 1998 and 2004 in Myasnikov's Institute of Cardiology. Coronary angiography and myocardial biopsy was performed 6-monthly. Flow-limiting stenoses were treated by PTCA. Four patients had multi-vessel disease. A total of 15 PTCA were performed to 4 patients during follow-up. One patient underwent PTCA of obtuse margin artery with persistent long-term (over 1 year) angiographic success. Another patient had PTCA of LAD and CA at different time points, the long-term angiographic outcome (over 2 years) was good as well.

Follow-up revealed frequent aggravation of autoimmune conditions in two patients. Coronary angiography in these patients showed multiple lesions of coronary arteries. The first patient underwent angioplasty of various LAD portions (5 procedures), the second patient had 3 procedures of LAD PTCA and 5 procedures of DA PTCA. In addition to persistent long-term PTCA results (10 to 25 months) these patients had new lesions in another portions of coronary arteries and diffuse narrowing of distal branches necessitating repeated PTCA. Angiographic success was achieved in all cases (residual stenosis below 30%), all procedures went without complications.

We found, that these patients had prolonged successful PTCA outcome, however, at the same time new lesions permanently form in other coronary artery segments. We therefore believe, that percutaneous PTCA is beneficial in patients after orthotopic heart transplantation.

PLACE OF PARTIAL MYOCARDIAL REVASCULARIZATION IN THE TREATMENT OF CAD IN GERIATRIC PATIENTS

D.A. Korotkov, A.V. Kuznetzov (Syktyvkar)

Purpose of the study was to assess the efficacy of partial myocardial revascularization by coronary angioplasty (CA) for coronary artery disease in geriatric patients.

Materials and methods: Partial myocardial revascularization by CA was performed to 73 geriatric patients aged 60 to 73 (mean age 69) between 1998 and 2003. Of these 58 (79.5%) were men. Severe comorbidities were found in 53 patients (72.6%). The following methods of CA were used: balloon angioplasty in 56 patients(76.7%), stenting with balloon predilation in 4 patients (5.5%), direct stenting in 8 patients (10.9%), coronary stenting with balloon postdilation in 2 patients (2.7%), combination of methods for multi-vessel disease in 3 patients (4.1%).

Early postoperative complications were found in 4 patients. Cardiac events (AMI within the first day after CA) were observed in 2 (2.7%) and non-cardiac events (cerebrovascular accident) - in another 2 patients (0.85%). Hospital mortality rate was 2.7%. Six months later restenosis was revealed in 4 patients (5.4%); stent occlusion in 1 patient (1.4%); survival rate was 94.6%, as compared with 92.9% 5-year survival.

Conclusions: CA is highly effective for partial revascularization in elderly and geriatric patients with CAD; the rate of successful CA in elderly patients is similar to that of another age groups with minimum incidence of complications.

PERCUTANEOUS DELAYED INTERVENTIONAL PROCEDURES IN PATIENTS WITH MULTI-VESSEL LESIONS OF THE CORONARY ARTERIES

V.V. Korobov, A.G. Ivanov, R.F. Makhmutov, S.V. Jernakov (Kazan)

Purpose of the study: to assess the efficacy of delayed angioplasty in patients with multi-vessel coronary artery disease in clinical settings without surgical support.

Coronary interventions were performed in 60 patients as an elective procedure. Mean age of patients was 49±4.3 years, 58 of them were males (96.4%). Time interval between coronary angiography to angioplasty was 12±5 days. Patients were divided between the following groups: acute myocardial infarction - 1 patient (1.6%), unstable angina - 6 patients (10%), stable angina - 53 patients (88.4%).

Balloon angioplasty was performed in 4(7%) patients, two-vessel stenting (LAD+CA; LAD+RCA) - in 42(70%) patients, three-vessel stenting (LAD+CA+RCA) - in 14(23%) patients. Coronary artery recanalization was conducted in 10(17%) patients.

Mean left ventricular ejection fraction was 55±8%. Mean lesion length was 18±5 mm, mean arterial reference diameter - 3.4±0.42 mm. We used Bx Sonic, Bx Velocity, and Cypher endovascular stents (Cordis). Immediate angiographic success was 100%. A total of 128 stents were implanted. No angina was found in 42(70%) patients, grade I angina - in 11(18.4%) patients, grade II angina - in 7(11%) patients. Follow-up angiography was performed at 6 months in 11(18.4%) patients and revealed no signs of significant restenosis. These findings suggest that angioplasty is highly effective for multi-vessel coronary artery disease.

STENTING IN MULTI-VESSEL CORONARY LESIONS

V.B.Boshkov, V.Yu. Sibirsky, S.S. Murashko (Moscow)

Since 2000 PTCA and stenting have been performed in 246 patients. Emergency use of balloon angioplasty and stenting of coronary arteries in patients with acute coronary syndrome (63%) in the majority of cases was limited to the symptomatic artery.

During elective endovascular interventions we attempted complete myocardial revascularization. Routine preparation included prior use of plavix 75 mg daily or its bolus administration one day before surgery in a dose of 300 mg. Simultaneous multi-vessel stenting of 2 or more lesions was performed in 73 patients. Drug-eluting Cypher stents were used in 20 cases. All cases of multi-vessel angioplasty and stenting resulted in almost 100% myocardial revascularization with substantial increase of exercise tolerance and no signs of myocardial ischemia on follow-up stress-test per-

formed at 3-6 weeks. Follow-up coronary angiography at 3-6 months after stenting revealed 6 cases of in-stent restenosis including 1 case with Cypher stent. All cases of in-stent restenosis were successfully managed by repeated balloon angioplasty.

We believe, that simultaneous multi-vessel stenting is highly effective for coronary atherosclerosis and can surely be an alternative to coronary bypass grafting. In our opinion, this method is particularly useful in case of severe comorbidities, which significantly aggravate both operational risk and postoperative prognosis, in young patients and if the open surgery is rejected.

ACUTE CORONARY SYNDROME (ACS): INVASIVE STRATEGY OF TREATMENT IN THE SETTINGS OF CITY CLINIC IN A LARGE INDUSTRIAL CENTER

S.V. Kozlov, A.A. Lipchenko, E.G.Fokina, V.G. Grachev, P.I. Gorbenko (Ekaterinburg)

Purpose of the study: to substantiate the need for coronary angiography in patients with high and moderate risk acute coronary syndrome, as well as to assess the efficacy of interventions in these patient group. Two approaches exist to coronary angiography in ACS patients: 1 - early interventional therapy (catheterization in all ACS patients) and 2 - medical therapy (catheterization is performed when clinically indicated).

On admission the patients are stratified between risk groups according to TIMI criteria. Between May 2003 and September 2004 a total of 177 diagnostic coronary angiography procedures were performed. Time to coronary angiography in high risk patients didn't exceed 24 hours.

Time to therapeutic intervention:

1. Simultaneous procedure was performed for ACS with ST elevation, as well as for ACS without ST elevation, but with blood flow of TIMI 2 or below in the symptomatic artery;
2. Delayed interventions (up to 1 week) were performed for ACS with persistent signs of ischemia and good distal blood flow. The procedure was carried out in combination with clopidogrel (300-600 mg loading dose) + 100 mg aspirin.

A total of 75 therapeutic interventions were performed. Of these, 18 were PTCA and 57 - coronary stenting procedures. Immediate angiographic success was 94%.

Conclusions: We believe, that all patients with high risk ACS necessitate coronary angiography during the first day of the disease to identify the affected coronary artery and optimize the treatment strategy in this patient group.

ADEQUATE MYOCARDIAL REVASCULARIZATION - SOME ASPECTS OF PTCA IN POLYSEGMENTAL CORONARY LESION

A.E. Vasisliev, S.V. Yakoniuk, P.V. Chepenko (Vladimir)

Purpose: to determine optimal strategy of endovascular therapy in patients with polysegmental and multi-vessel coronary lesions of coronary arteries in order to achieve optimal outcome.

Materials and methods: The study enrolled 42 patients with coronary artery disease (CAD) stratified by the number and location of segments and arteries affected, as well as by the extent of endovascular repair. All patients were men aged 43 to 65 years (mean age 54.0±6.3 years).

All patients had chronic CAD (functional class FC 3-4 stable angina). Coronary angiography revealed two or more affected segments of various coronary arteries in all 42 patients. Multiple stenoses (including tandem stenoses) of the LAD and its branches accounted for 54.8% of cases (23 patients), stenoses of LAD and the circumflex artery (CA) - for 19.0% of cases (8 patients), stenoses of LAD and the right coronary artery (RCA) - for 14.3% of cases (6 patients), stenoses of RCA + CA - for 11.9% of cases (5 patients) respectively. Only flow-limiting (over 50%) stenoses were assessed. In case of a multi-vessel disease stress-echocardiography was mandatory performed prior to PTCA and stenting in order to define the symptomatic vascular territory. PTCA with implantation of a single stent was performed in 35 cases (group I). Seven (7) patients (group I) underwent implantation of 2 or more stents; in two of these patients (IIa) we only repaired LAD, the remaining 5 patients (IIb) additionally underwent stenting of RCA or CA.

Results: Mean increase in left ventricular ejection fraction (LVEF) in group I within 5-7 days following the intervention was 8%. The mean increase in the same parameter in group II was significantly higher (14%) predominantly due to group IIa patients with complete reconstruction of LAD, who exhibited 19% increase in LVEF. Besides, all patients from group II had earlier improvement (1-2 days after the intervention) as confirmed by clinical values.

Conclusions: Preoperative assessment must include determination of symptomatic vascular territory on the basis of combined clinical and instrumental analysis. Further surgical tactics will rely on the combined postoperative assessment of the efficacy of coronary angioplasty and myocardial revascularization. "Complete" correction of blood flow in the symptomatic artery is commonly adequate and sufficient intervention, particularly with respect to LAD. Complete adequate myocardial revascularization is defined as maximum restoration of blood flow in coronary arteries where technically possible, however, it is not always necessary for persistent clinical improvement.

CLINICAL EFFECTIVENESS AND LONG-TERM PROGNOSIS OF CORONARY STENTING IN CAD PATIENTS WITH LOW LV EF.

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

Purpose of the study was to assess the association between the degree of revascularization of vital myocardium and immediate and long-term results of coronary stenting in CAD patients with left ventricular ejection fraction (LVEF) at baseline below 35%. The study enrolled 46 CAD patients, who underwent angiographically successful multi-vessel coronary angioplasty. The criterion to divide patients between two groups was the volume of revascularized vital myocardium. Both groups had comparable clinical and angiographic criteria and only differed in the extent of revascularization as regards to vital myocardium. Immediate clinical success in complete revascularization group (I) was observed in 63.2% ($p<0.05$). Among patients with immediate clinical success the symptoms of angina and signs of myocardial ischemia were significantly more common in group II compared to group I (83.4% vs 3.8%, respectively, $p<0.05$). EchoCG performed after revascularization procedure in group I patients revealed significant increase of LVEF (from 31.2±3.2% to 41.6±5.1%, $p<0.001$), whereas in group II patients the changes of EF were statistically non-significant. Comparison between groups showed 3-year survival rate in group I to be significantly higher, than in group II (85.5% vs 41.7%, respectively, $p<0.05$).

Conclusion: Coronary angioplasty, which provides complete revascularization of vital myocardium, is an effective method to treat CAD in patients with baseline LVEF below 35%.

LONG-TERM FOLLOW-UP OF ENDOVASCULAR PROCEDURES (PTCA AND STENTING OF THE CORONARY ARTERIES) IN PATIENTS WITH CAD AND DIABETES MELLITUS. RESULTS OF SINGLE-CENTER STUDY.

D.G. Iosseliani, I.Yu. Kostianov, S.P. Semitko, A.V. Koulikov (Moscow)

The purpose consisted in the study of clinical and angiographic effects of endovascular procedures (PTCA and stenting) in patients with CAD and diabetes mellitus.

Material and methods: from February 2000 till October 2004 coronary endovascular procedures were performed in 136 patients with CAD and diabetes mellitus. Of them 65 patients had 87 stents implanted into 78 coronary arteries, another 71 patients underwent PTCA. 92 patients (68,4%) underwent control examination, including coronary angiography, in average 6,8±3,4 months after the procedure.

Results: Immediate angiographic success of the procedure was achieved in 87,9% of cases. Hospital mortality - 1,2%. According to control coronary angiography, long-term rate of restenosis was 3,0%, the rate of stent occlusions - 8%. Correlation analysis (Spirmen rank correlation) revealed the following risk factors in patients with diabetes mellitus: artery diameter in the site of procedure < 3mm; localization of the lesion in the ostium and the proximal one-third of the LAD; C type of vascular lesion. Thus, the rate of restenosis in the stented patients with all three risk factors was 28,4%. In the group of patients with the same risk factors who underwent PTCA only, the rate of unfavorable long-term angiographic result was 48,7%. On the contrary, on the group of stented patients without the above risk factors the rate of unfavorable long-term angiographic result was 2,8%. The rate of unfavorable long-term angiographic result among the patients with non-insulin dependent diabetes mellitus who underwent PTCA only, was 5,8%.

Conclusions: Long-term results of coronary endovascular procedures (PTCA and stenting) in patients with CAD and diabetes mellitus are characterized by significantly higher rates of restenoses and reocclusions. However, in the absence of the risk factors (ostial lesion of the LAD, artery diameter 2,5 mm or less, C type of arterial lesion) long-term results of endovascular procedures in such patients are quite comparable with those in patients with CAD, but without diabetes mellitus.

«Endovascular Treatment of Bifurcational Stenoses»

INTERVENTIONAL MANAGEMENT OF CORONARY BIFURCATION LESIONS WITH SIROLIMUS-ELUTING STENTS USING THE CRUSH TECHNIQUE

I. Moussa (New York, USA)

Background: Recently, a small randomized clinical trial demonstrated that treatment of coronary bifurcation lesions with sirolimus-eluting stents (SES) using the T-stenting reduces restenosis in the main vessel, but recurrence at the ostial side branch remains a problem. It has been suggested that recurrence at this location is due to the lack of lesion coverage. The "crush technique" (CT) has been advocated to provide complete coverage of the side branch ostium. This prospective registry evaluated the safety and efficacy of SES for treatment of coronary bifurcation lesions using the CT.

Methods: All consecutive patients who underwent bifurcation stenting with the CT using SES between April 2003 and November 2003 (108 patients) were included in this analysis.

Results: Mean pt age was 64+10 yrs., 69% were males, and 38% were diabetics. Bifurcation lesions involved the LM, LAD, LCX or RCA in 9%, 66%, 21%, and 4% of pts, respectively. Quantitative angiographic measurements in the parent vessel and side branch were: mean vessel size (2.73 +/- 0.41 mm vs. 2.20 +/- 0.43 mm) and mean lesion length (18.09 +/- 6.41 mm vs. 12.29 +/- 4.60 mm), respectively. Clinical follow-up was completed for all pts at 30-days and for 75 patients at 6 months. Patients who had final kissing balloon dilatation (88%), compared to those who did not (12%), tended to have lower need for TLR (10% vs. 22%) but this difference did not reach statistical significance (p=0.29).

	Patients
30-day	N=108
Stent thrombosis*	2 (1.9%)
6-month	N=75
Death	0 (0%)
Myocardial infarction	0 (0%)
Target lesion revascularization	9 (12%)
Only parent vessel	2.7%
Only branch vessel**	6.6%
Parent and branch vessel	2.7%

** Both pts suffered myocardial infarction*
*** 86% of recurrence occurred at the ostium*

Conclusions: Treatment of bifurcation lesions with SES using the CT is safe and highly predictable. This technique results in low frequency of TLR, however, recurrence remains more common at the side branch ostium. Performance of final kissing balloon dilatation may reduce the frequency of this event. Future efforts need to focus on development of dedicated drug-eluting bifurcation stent designs.

EXPERIENCE WITH THE TREATMENT OF BIFURCATIONAL LESIONS OF THE CORONARY ARTERIES.

A.N. Samko (Moscow)

Abstract not submitted.

BIFURCATIONAL LESIONS OF THE CORONARY ARTERIES: FATE OF NATIVE LATERAL BRANCHES AFTER MAIN VESSELS STENTING IN THE SITE OF BIFURCATION

D.G.Iosseliani, D.G. Gromov, S.P. Semitko, A.G. Koledinsky, I.S. Topchian (Moscow)

Purpose: to study the state of lateral branches early and late after main vessels stenting for bifurcational lesions of coronary arteries.

Material and methods: we have studied the data of 76 patients who underwent 79 procedures of stenting of bifurcational segments of the coronary arteries in 2000-03. Mean age of patients was 56,7±7,5 years. 80% of them were males, in 49% there was exertion angina of the I-IV NYHA calss, in 30% - unstable angina and 25% suffered AMI. LAD was stented in 70%, CxA - in 13% and RCA - in 17% of cases. The second-order vessels were represented by the diagonal, large septal and marginal branches. The average diameter of those vessels was 2,2±0637 mm. Bifurcational lesions of the 1, 2, 3, 4 and 4a types were encountered in 29%, 19%, 22%, 12% and 18% of cases, respectively. Control selective coronary angiography was performed at least 6 months after the procedure.

Results: optimal result of the stenting of the main artery was achieved in 100% of cases, in most cases matrix and modular stents were used. In 55 cases (69,6%) angiographic picture of the lateral branches was unchanged (group 1), in 18 cases (22,8%) their stenosis was enhanced (group 2), in 6 cases (7,6%) the angiographic picture was suggestive of the occlusion. One patient (1,3%) suffered in-hospital non-Q MI due to the lateral branch occlusion, the remaining 5 patients with the same angiographic complication had no AMI. We didn't see any other complications as well as anginal attacks in the early postprocedure period.

Control examination, including selective coronary angiography, was carried out in average 6,7±1,5 months after the procedure. In 67% of cases the permeability of the stent was totally preserved, in 31,6% there was in-stent stenosis, in 1,3% of cases the stent was occluded. Tabl. 1 shows the state of lateral branches in the studied groups.

Table 1. Dynamics of the state of lateral branches in the studied groups (as judged by control selective coronary angiography /CAG/)

State of lateral branches (by selective CAG data)	1 (n=55)	2 (n=18)	3 (n=6)
without significant changes	46 (83,6%)	4 (22,2%)	0
- aggravation (increase of the stenosis' degree)	8 (14,5%)	0	0
- aggravation (occlusion of the lateral vessel)	1 (1,8%)	0	0
- improvement (decrease of the stenosis' degree or resumed blood flow in the occluded branch)	-	14 (77,8%)	6 (100%)

The aggravation of angiographic picture concerned lateral branches and was most often seen: when this branch arose from the main artery at an angle >70%; when this branch arose form the side of stenosing plaque; when its diameter was < 2 mm.

By the moment of control examination 42 (55,3%) patients had no CAD symptoms, in 29 (38,1%) there was exertion angina of the I-III NYHA class, and in 4 (5,3%) - unstable angina. In the vast majority of cases the resuming and the progressing of angina was related to the main artery restenosis. One (1,3%) patient suuferd non-Q MI due to the lateral vessel occlusion 2 months after the procedure.

Conclusion: thus, the stenting of only the main coronary artery in cases of bifurcational lesions does not lead to the aggravation of the state of the lateral branch in the vast majority (70%) of cases (as judged by the data of selective coronary angiography. The persisting stenotic lesion of the lateral branch, if existing, does not exert significant influence on the course of the disease. The recurrence of anginal symptoms in the vast majority of cases is caused by the developing restenosis of the main artery, its rate still being high - 31,6%.

FIRST EXPERIENCE WITH BIFURCATIONAL CORONARY STENTING WITH MULTI-LINK FRONTIER STENT UNDER INTRAVASCULAR ULTRASONIC CONTROL

V.V.Demin, A. V.Demin, A.K. Almakaev (Orenburg)

We implanted Multi-Link Frontier stents in three patients. Baseline and control intravascular ultrasonic scanning (in-Vision System, Jomed/Volcano) was conducted in all three cases. In all the patients the procedure was performed in the bifurcation of the left anterior descending artery (LAD) and large diagonal branch (the first DB - in two cases, and the second DB - in one case). Stent size was selected with regard to the diameter of unaffected part of the left anterior descending artery below the bifurcation. The third (longitudinal) view of the intravascular ultrasonic visualization allowed for an exact verification of the plaque extension at the arterial bifurcation and the length of DB stenosis. In two cases the major lesion was located in the LAD, and in one case - in the DB. In the latter case baseline intravascular ultrasonic scanning was performed also for specification of the LAD stenosis severity.

Control three-view intravascular ultrasonic scanning clearly visualized stent structure thus enabling us to confirm its optimal position towards bifurcation in all three cases, Good apposition and optimal expanding of the stents achieved during the implantation allowed us to avoid additional procedures. In one case distant DB PTCA was performed after stent implantation, In all the patients a positive clinical effect was achieved and persisted over the follow-up period (1 and 6 months after the procedure).

Thus, the use of specially designed bifurcational stents seems to be a promising nethod of treatment for bifurcational lesions. Use of intravascular ultrasonic control allows for the most effective and safe implantation of such stents.

IMMEDIATE AND LONG-TERM RESULTS OF CORONARY STENTING THROUGH A LATERAL BRANCH WITHOUT SUBSEQUENT DILATATION OF THE STENT LINK

V.I. Ganiukov, A.A. Shilov, N.I. Susoev, I.N. Shigantzov, E.A. Levchenko, R.S. Tarassov, M.V. Demina, I.Yu. Bravve (Novosibirsk)

Purpose: to study immediate and long-term results of coronary stenting through a lateral branch without subsequent dilatation of the stent link.

Methods: We analyzed the results of 160 angioplasty operations with stenting through a lateral branch performed over 2001-2004. Patients' age varied from 38 to 84 years old (on average 54.94±9.1 years old), 135 of them were males (84.4%). Fifty five patients (34.4%) suffered from unstable angina pectoris, 104 (65%) - from stable angina pectoris, in 1 patient (0.6%) percutaneous coronary intervention (PCI) was performed in the acute period of myocardial infarction. In most cases stenting was performed on the diagonal (48.8%), septal (16.9%) and right ventricular (15.6%) branches. The mean lateral branch diameter amounted to 2.0±0.45 mm. Both immediate and long-term PCI results were analyzed (with the average follow-up of 6.73±3.82 months).

Results: Immediate angiographic success was achieved in 100% of cases, in 1 patient (0.6%) closing of the diagonal branch was complicated with small-focal anterior myocardial infarction. Long-term results were assessed in 51 patients (31.9% of all angioplasty operations performed). The analysis in the long-term period revealed that clinical improvement (absence or decrease of the functional class of angina) remained in 41 patients (80.4%). Nine patients (17.6%) complained of recurrent or increased functional class of angina pectoris, 1 patient (2%) developed myocardial infarction. A repeated intervention was performed in 10 patients (19.6%). Among them PCI was performed in 8 cases, coronary artery bypass grafting was performed in 2 patients.

Conclusion: PCI with stenting through a lateral branch showed high efficacy and safety.

TREATMENT OF BIFURCATIONAL LESIONS WITH ML FRONTIER STENTS

M. Lesiak (Poznan, Poland)

Abstract not submitted.

TREATMENT OF BIFURCATIONAL STENOSES: EARLY AND LONG-TERM RESULTS

A.M. Babunashvili, D.S. Kartashov, Z.A. Kavteladze, G.Yu. Travin, D.P. Dundua, Yu.V. Artamonova (Moscow)

Purpose of study: to evaluate the effectiveness of coronary stenting (CS) with non-drug-eluting stents for different types of bifurcational coronary lesions.

Materials and methods: we analyzed the results of CS of different types of bifurcational stenoses in 204 patients aged 35 - 76 years (mean age 54.3 - 3.4 years), among them - 21 patients with bifurcational stenoses of the main LCA. The stenting was performed in all types of bifurcational stenoses; in particular, 45 - of the I type (22.1%), 60 (29.4%) - of the II type, 67 (32.8%) - of the III type and 22 (10.7%) - of the IV type. Y-shaped bifurcations were found in 177 (86.7%) cases, T-shaped - in 27(13.3%) cases. The distribution of stented bifurcations was as follows: LAD + DB - 118 patients (57.8%), CxA+OMB of the CxA - 47 (23.1%) and RCA - 18 patients (19.9%). The "Culotte" technique was used in 67 cases (32.8%), "Crush" - in 21 (10.3%), T-stenting - in 22 cases (10.8%); lateral branch wasn't stented in 94 cases (46.1%). In all patients we performed final PTCA with two "kissing" balloons.

Results: Hospital complications were seen in 11 patients (5.4%). Among them 1 patient (0,5%) died, 10 patients (4,9%) developed AMI. In the remaining patients the intervention was clinically effective. Long-term follow-up lasted for 6 - 44 months. 1- and 3-year survival was 98.8% and 94.4%, respectively. AMI was seen in 12 patients (6.2%). Control angiography was performed in 128 patients (66.3 %). The rate of angiographic restenosis was 58.7%, with 90,5% of all cases of restenosis localized in the lateral branch ostium. The rate of repeated revascularization was 57.3%. With this in 94 patients with non-stented lateral branches angina recurrence and angiographic restenosis were seen in only 16.7% of cases, while in cases with stented lateral branch the rate of restenosis was 70.6%.

Conclusion: the stenting of bifurcational lesions is an effective intervention from the viewpoint of immediate and late results. However the stenting of the lateral branch leads to a very high rate of repeated angiographic restenoses and repeated myocardial revascularizations. The rate of restenosis in cases of lateral branch stenting does not depend on the stenting technique used. The stenting of the main artery only is accompanied by low rate of repeated restenoses and MACE.

ENDOVASCULAR TREATMENT OF BIFURCATIONAL LESIONS OF THE CORONARY ARTERIES IN CAD

V.A. Ivanov, Yu.V. Nemytin, S.A. Terekhin, Yu.A. Bobkov, I.V. Trunin, S.V. Volkov, I.V. Mostovoy, V.A. Smirnov, A.V. Ivanov (Krasnogorsk)

We conducted retrospective (data of 2002) and prospective (2003-2004) analysis of endovascular treatment in patients with coronary artery disease with bifurcational lesions of the coronary arteries. Three hundred twenty six endovascular procedures with bifurcational stenting were performed in 303 patients within the mentioned period. Bifurcation of the anterior interventricular artery and the first or the second diagonal branch were was the most common sites of procedure (84.4% of cases). The procedure was also performed on the bifurcation of the circumflex artery and the first or the second obtuse marginal branch (11.0%) and on the bifurcation of the right coronary artery into posterior interventricular branch and posterolateral branch (4.6%). An immediate success of the procedure in the main branch amounted to 100%, and in the lateral branch - 92.5%. There were no cases of hospital death. Serious complications were observed in 3 cases (1.5%); among them there were three cases of Q-wave myocardial infarction and two cases of non-Q-wave myocardial infarction. Long-term results (6 to 12 months after the procedure) were analyzed in 102 patients.

The analysis results allowed to make the following conclusions and to elaborate the algorithm for performing an X-ray-guided surgery in bifurcational lesion of the coronary artery.

Bifurcational stenting is an efficacious and rather safe method of surgical treatment of coronary artery disease. Bifurcational lesion of the coronary arteries requires a special "bifurcational approach" to the operation planning even in cases of a rather small caliber (less than 2 mm) of the lateral branch because of the risk of lateral branch occlusion with the subsequent myocardial infarction.

COMPARATIVE EFFECTIVENESS OF DIFFERENT METHODS OF BIFURCATIONAL STENTING USING RAPAMICINE-ELUTING STENTS (Cypher (Cordis))

S.A. Abugov, Yu.M. Saakian, M.V. Puretzky, O.V. Sankov, R.S. Poliakov (Moscow)

Purpose of the study was to compare various methods of bifurcational stenting.

The study enrolled 89 patients with bifurcational stenosis. Depending on the method of bifurcational stenting the patients were divided between the 3 groups. Group 1 (T - stenting) included 43 patients, group 2 (crush stenting) - 37 patients and group 3 (reverse crush stenting) - 19 patients respectively. Cypher stents (Cordis) were implanted in all patients.

Immediate success was achieved in all patients. Long-term results (6 to 8 months) were assessed in 73 patients. In two patients with clinical success we found further clinical aggravation due to restenosis at the site of prior stenting.

In conclusion, preliminary analysis of the immediate and long-term results suggests high clinical efficacy of all the three methods of bifurcational stenting with Cypher stents.

«Interventional Radiology in Oncology -1»

USE OF CELLULAR NITINOL STENTS FOR ENDOVASCULAR ELIMINATION OF OBTURATION SYNDROME IN ONCOLOGICAL PATIENTS

B.I. Dolgushin, V.A. Cherkassov, A.M. Nechipay, R.P. Litvinov (Moscow)

The method of self-expanding metal stent (endograft) implantation into various tubular organs was introduced in Blokhin's Russian Research Center of Oncology to restore the patency of tubular organs in inoperable oncological patients.

Stenting of bile ducts was performed in 37 patients with biliary stricture due to malignant growth and in 2 patients with cicatrical stricture of biliary-enteric bypass following pancreaticoduodenal resection.

Cellular metal stents were used to restore patency of the esophagus in 50 inoperable oncological patients with severe dysphagia (grade III-IV). After the procedure 7 patients suffered grade I dysphagia, the remaining patients had no discomfort during meal. One procedure was complicated by stent coating damage; it was managed by telescopic implantation of another stent inside the previous one.

Implantation of a self-expanding metal stent for colorectal carcinoma causing large intestine obstruction was performed in 2 patients ensuring natural passage of faeces, one of these patients subsequently underwent radical single-stage surgery.

In 6 cases the self-expanding metal stents were deployed to restore airway patency after postoperative cicatrical stricture of the tracheobronchial tree.

Stenting for ureteral radiation stricture, which resulted from intraureteral contact radiation therapy in a patient with carcinoma of proximal ureter of a single kidney, restored normal urine flow. The follow-up period was 44 months.

Implantation of self-expanding steel and nitinol stents is technically available, effective and relatively safe procedure to manage obstruction of various tubular organs, provide social rehabilitation of such patients and substantially improve the life quality of oncological patients. Russian nitinol stents are as effective as similar foreign devices and may be designed individually in accordance with relevant parameters.

ANGIOGRAPHY IN SOME NEOPLASMS OF THE SKULL BASE AND PARANASAL SINUSES

D.P. Stoliarov, A.V. Protopopov, T.A. Kochkina, E.P. Konstantinov (Krasnoyarsk)

Purpose of the study: To assess the angiographic appearance of various lesions located in skull base and paranasal sinuses.

Materials and methods: Comprehensive examination including angiography of craniofacial vessels was performed in 42 patients admitted to Krasnoyarsk Regional Clinical Hospital for suspected skull base tumor. Results: The most distinctive angiographic appearance was associated with juvenile angiofibroma of the skull base showing enlarged afferent arteries with dense neogenic vasculature, severe disorders of the organ circulation and accumulation of contrast agent within the tumor corresponding to the pathological vascularity. On the lateral aspect angiofibroma was commonly posterior to the terminal bifurcation of the internal maxillary artery, which was the main source of the tumor blood supply. The above angiographic pattern was observed in all patients with subsequently confirmed cytologic diagnosis of skull base juvenile angiofibroma and differed from angiographic patterns in patients with other skull base lesions. Thus, in patients with nasopharynx lymphosarcoma angiography revealed displacement of arteries by a space-occupying mass with poor vascularity. Maxillary sinus cyst appeared as a round-shaped lesion and had no vascularity, however, marked homogeneous vascularity with hypertrophy of nasal and infraorbital branches of the internal maxillary artery was observed at the sites of polyp formation in the peripheral regions of the cyst. Vascularized polyps of nasal cavity and maxillary sinus were located in their anterior regions and were supplied with blood from terminal portions of nasal and major palatine branches of the internal maxillary artery. The mass was remarkable for the area of intense homogenous opacification with reduced blood flow velocity and accumulation of contrast medium.

Conclusion: angiography not only provides important information on the vascular territory and the lesion studied, but also serves as an additional method to differentiate between juvenile angiofibroma and other skull base lesions.

FIRST CLINICAL EXPERIENCE WITH PREOPERATIVE SELECTIVE EMBOLIZATION OF THE LOBAR ARTERY OF LIVER

V.V. Kucherov, A.V. Gaydukov, S.V. Zakharov (Moscow)

Selective embolization of the right lobar artery of liver was performed in two patients since January 2004. Purpose of the procedure was to decrease blood loss during open surgery (liver lobe resection).

Embolization was performed in a woman with giant hemangioma (over 10 cm in diameter) of the right lobe of liver and in a man with gastric cancer metastases into the right lobe of liver. Polyvinyl alcohol particles (TrueFill) 250 μm and 500 μm in diameter were utilized for embolization. In both patients liver lobe resection was performed 3 days following the procedure. In the first patient we failed to advance the catheter below the origin of cystic artery for anatomical reasons, and the patient developed acute postembolization cholecystitis. The latter was managed with medical therapy in view of the scheduled resection 2 days later. In the other patient postoperative recovery was uneventful.

Despite the small number of patients we observed significant decrease of blood loss during open surgery as compared to resection alone.

CAVA-FILTER IMPLANTATION - AN ADEQUATE PROCEDURE FOR THE PREVENTION OF PULMONARY ARTERY THROMBOEMBOLISM IN ONCOLOGICAL PATIENTS

B.I. Dolgushin, V.A. Cherkassov, E.R. Virshke (Moscow)

Severe pulmonary artery thromboembolism (PATE involving the pulmonary trunk and major pulmonary arteries) is one of the causes of hospital mortality. Postoperative deep vein thrombophlebitis of lower limbs and pelvis - the most common source of PATE - is found in 66-67% of oncological patients, which is 2 times as high as in general surgery patients. Implantation of a special filter into the inferior vena cava is an accepted method of PATE prevention. A total of 96 filters were implanted into the inferior vena cava in the Russian Research Center of Oncology since 1999.

Indications to cava-filter implantation were as follows:

- floating thrombi of iliocaval, iliofemoral, femoropopliteal and saphenofemoral vein portions causing PATE or a threat of it;
- repeated PATE in patients with unknown source of embolism, severe PATE prior to anticoagulation therapy or thrombolysis.

Contraindications were as follows:

- septic thrombosis or embolism when vein ligation is the only possible option;
- bilateral iliofemoral vein thrombosis in patients with superior vena cava occlusion or neck inflammatory conditions;
- relative contraindication is the progression of thrombosis to the origin of renal veins and higher.

Infrarenal portion of the inferior vena cava is the optimal site of cava-filter implantation. This location blocks up all possible sources of PATE originating from the inferior vena cava. In 2% of cases with prolonged occlusion of both renal veins and a floating thrombus in the suprarenal portion of the inferior vena cava the cava-filter was deployed above the renal veins, but below hepatic veins.

The desired outcome was achieved in all patients - no signs of pulmonary embolism were observed postoperatively. There was a single complication (cava-filter was implanted slantwise due to inadequate choice of the diameter).

We conclude that interventional radiological procedure of cava-filter implantation into the inferior vena cava is an adequate procedure for prevention of PATE in oncological patients.

IMPLANTATION OF AN ORIGINAL OCCLUDER - A METHOD OF TREATMENT OF POSTOPERATIVE BRONCHO-PLEURAL AND TRACHEO-PLREURAL FISTULAE

B.I. Dolgushin, V.A. Cherkassov, A.M. Nechipay, O.A. Pankratenko (Moscow)

Over 50 operations for lung cancer are performed annually in Blokhin Russian Research Center of Oncology. Postoperative complications are observed in 11.6% patients. Surgical complications first of all include bronchial suture line leak (BSL) causing bronchopleural or tracheopleural fistula. This complication was found in 3.8%

patients, who underwent pneumonectomy or lobectomy. The rate of BSL following pneumonectomy was 6.5% vs 1.2% after lobectomy.

Purpose of the study - to demonstrate the method of effective isolation of bronchial tree from suppurative pleural cavity using stent-occluder of original design in patients with postoperative bronchopleural and tracheopleural fistulas.

Clinical data. Stent-occluder was implanted in two patients with right lung cancer. Both underwent pneumonectomy on the right side complicated with subsequent right primary bronchus stump deficiency causing the development of fistulas 3 and 11 mm in diameter respectively and residual cavity empyema. Right pleural cavity was drained for the purpose of pleural empyema sanation. Original Russian stent-occluders (patent RU 38102 U1) were implanted in the fistulas during purulent inflammation after a comprehensive examination, which included computerized 3D-imaging. The anastomoses became completely leak-proof. No complications were observed during surgery. Sanation of residual cavity was further continued. Both patients were discharged with no signs of recurrent fistula. A smaller fistula necessitated implantation of an additional stent-occluder 10.5 months following surgery due to complete expanding of bronchus stump caused by cutting of ligature. Subsequent scheduled endoscopy and X-ray examinations showed effective closure of fistulas. Both patients died 6.5 and 16 months following the implantation of stent-occluders respectively. Autopsy revealed no signs of recurrent fistula.

Conclusion. The above method implying the use of original Russian stent-occluder can be considered an effective method of urgent bronchopleural and tracheopleural fistula closure following pulmonectomy in cancer patients.

PERCUTANEOUS PUNCTIONAL NEPHROSTOMY IN ONCOLOGY

B.I. Dolgushin, I.A. Trofimov (Moscow)

Purpose: To elaborate indications and contraindications to emergency percutaneous punctional nephrostomy (PPN) in oncological patients.

Materials and methods: For the last 12 years a total of 464 patients with urine outflow obstruction in the upper urinary tract underwent percutaneous punctional nephrostomy in Blokhin Russian Research Center of Oncology. Nephrostomy was unilateral in 326 (70%) patients and bilateral in 138 patients. We developed a diagnostic algorithm for oncological patients. Examination included blood chemistry, ultrasound scanning, renal scintigraphy and sometimes excretion urography. PPN was performed urgently or electively depending on the medical history, laboratory and instrumental examination.

Conclusion: Emergency nephrostomy (which accounted for 17% of all cases) is indicated in patients with bilateral acute urine outflow obstruction in the upper urine tracts resulted in severe azotemia (particularly associated with elevated potassium level), caused by tumor (invasive growth or compression of ureters) or iatrogenic factors (surgical injury, radiation fibrosis). In such patients following PPN extracorporal hemosorption is considered, which is otherwise impossible in case of infrarenal urinary outflow obctruction due to high risk of pyonephrosis. In patients with severe azotemia postoperative infection of the upper urine tracts is common, therefore, prophylactic antibiotic cover is needed. In addition, emergency PPN can be performed for internal ureteral fistula, anemia due to hematuria, bladder cancer (for the purpose of bladder drainage), pyelonephritis with signs of pyonephrosis.

In patients with unilateral urinary outflow obctruction contralateral kidney commonly compensates the function of the blocked kidney, therefore, blood nitrogen is normal or moderately elevated. Such patients (83%) might benefit from emergency percutaneous punctional nephrostomy.

Contraindications to nephrostomy include chronic renal impairment causing complete suppression of concentration and excretory functions (as suggested by renography and excretion urography).

REGIONAL INTRAARTERIAL ADJUVANT CHEMOTHERAPY AFTER LIVER RESECTION FOR COLORECTAL CANCER METASTASES

Yu.I. Patiutko, B.I. Dolgushin, I.V. Sagaydak, E.R. Virshke (Moscow)

A total of 277 liver resections for metastatic lesions have been performed in Blokhin Russian Research Center of Oncology since 1990. Of these, 185 (66.7%) patients underwent various liver resections for colorectal carcinoma metastases. Extended hemihepatectomy was performed in 25 patients, hemihepatectomy - in 69 patients. In another 91 (49.1%) patients anatomical resection of a single or two segments was performed. Postoperative mortality rate was below 3.7%. Among the patients operated on 41 had recurrent liver metastases (23 (33.3%) patients had isolated liver lesions).

To decrease the risk of recurrent liver metastases we are studying two options:

1. More extensive operation.
2. Adjuvant chemotherapy.

All patients with focal liver lesions underwent angiography to assess the anatomical type of vasculature, as well as the location of metastases and their association with liver vessels.

More accurate definition of liver vasculature type determines the possibility of postoperative regional chemotherapy. Adjuvant chemotherapy with 5-fluorouracil and leucovorin via regional intraarterial or systemic route was performed in 75 patients operated on for liver metastases of colorectal carcinoma. In this group of patients catheter was introduced into the appropriate artery (celiac trunk, right or left lobar arteries) under fluoroscopic guidance to facilitate regional intraarterial chemotherapy. Regional effect was impossible only in patients with vasculature type necessitating simultaneous and separate injection of chemotherapy drugs. Only in 7 patients the undesirable vasculature type precluded adjuvant regional chemotherapy. There were no complications related to catheterization and drug injection.

The comparative analysis of long-term results of the treatment of colorectal carcinoma liver metastases revealed that adjuvant regional intraarterial chemotherapy significantly improved the 5 year survival rate from 29.5% to 48.1% as compared to the group of patients receiving only surgical therapy.

Therefore, regional adjuvant chemotherapy ensures better long-term results of surgery in patients with colorectal carcinoma liver metastases and lower risk of local recurrence.

«AMI - Optimization of Therapy: Thrombolysis, PTCA, Stenting or Combination of Those Methods?- 1»

COMBINED USE OF PRE-HOSPITAL SYSTEMIC THROMBOLYTIC THERAPY (TLT) AND IN-HOSPITAL PTCA OF THE INFARCT-RELATED ARTERY (IOA) IN THE TREATMENT OF ACUTE MYOCARDIAL INFARCTION (AMI)

D.G. Iosseliani, S.P. Semitko, A.G. Koledinsky, O.P. Soloviev (Moscow)

Purpose of study: the evaluation of early and long-term results of combined use of pre-hospital TLT and PTCA of the IOA on hospital stage of the treatment of patients with AMI.

Material and methods: from July 2002 till December 2004 pre-hospital TLT was performed in 141 patients with AMI within the first hours after the onset of the disease (Actylise and Streptokinase in 32 and 109 patients, respectively). The effectiveness of thrombolytic therapy was 68,1%. After admission all patients underwent selective coronary angiography and, on indications, PTCA and/or stenting of the IRA. Depending on the results of treatment (TLT + PTCA) the patients were distributed into 3 groups:

1. Patients with successful TLT and successful PTCA of the IRA - n=65.
2. Patients with unsuccessful TLT and subsequent successful PTCA of the IRA - n=320.
3. Patients with AMI in whom endovascular therapeutic procedure was not performed - n=44.

The studied groups of patients were not different as for their baseline main clinical and angiographic indices.

Results: mean creatine phosphokinase level in group 1 (1766,5 U/l) was reliably lower than in two other groups (2212 U/l and 2458,6 U/l, respectively). Ejection fraction also was reliably higher in group 1 patients as compared with two other groups (56,5±11,1%; 51,8±12,2% and 50,7±13,3%, respectively). The complicated course of the disease during in-hospital period was encountered in group 1 less often than in two other groups; the difference being non-significant with group 2 and significant with group 3: the rate of AMI recurrence was 1,5%; 3,1% и 3,4%, respectively. During in-hospital period there were no mortality in group 1, while in two other group it reached 3,7% and 9%, respectively. Early postinfarction angina was observed in all the three groups in в 4,6%; 9,3% and 18,1% of cases, respectively. No cases of left ventricular failure were observed in group 1, while in two other groups this complication was observed in 3,1% and in 9% of cases, respectively.

Thus, the main clinical and laboratory values suggesting the limitation of left ventricular damage and the preservation of better functional capacity of the myocardium, seems more preferable in the group of patients who received early myocardial revascularization with subsequent adequate restoration of the blood flow during in-hospital stage, than in the group of patients with later restoration of the blood flow, and the more so in the group of patients in whom therapeutic endovascular procedure was not performed.

INFLUENCE OF SUCCESSFUL RECANALIZATION OF INFARCT-RELATED ARTERY ON HOSPITAL MORTALITY IN ACUTE MYOCARDIAL INFARCTION

D.P. Stoliarov, A.V Protopopov, T.A. Kochkina, EP. Konstantinov, Ya.O. Fedchenko, P.G. Gavrikov (Krasnoyarsk)

Objectives: to study influence of endovascular recanalization of the infarct-related artery (IRA) on hospital mortality in acute myocardial infarction.

Materials and methods: 237 patients with 246 AMI of various locations (9 rehospitalizations) were treated at Krasnoyarsk Regional Clinical Hospital in 2003.

Results: 206 (86.9%) patients underwent urgent coronary angiography. Moderate stenosis of coronary artery not requiring invasive revascularization was observed in 30 patients. Extremely extensive lesion of coronary arteries without any attempt of recanalization was observed in 18 patients. Endovascular restoration of coronary blood flow was performed in 165 cases. Immediate success was achieved on 165 arteries in 152 patients (92.1%). Recanalization of IRA failed in 13 cases (7.9%). Hospital mortality amounted to 7.3% of all cases, including reinfarctions. Mortality rate among 152 patients who required and underwent successful recanalization of the IRA amounted to 3.9% (6 patients). Two patients died among those who had no significant lesions of coronary artery according to coronary angiography data. Mortality amounted to 6.6%. Mortality amounted to 16.1% (10 patients) for the cases when revascularization of affected artery failed

Conclusions: Successful recanalization of the IRA is the main factor in reduction of the hospital mortality in patients with AMI.

EVALUATION OF THE EFFECTIVENESS OF PERCUTANEOUS CORONARY INTERVENTIONS IN ACUTE MYOCARDIAL INFARCTION

D.V. Opolonsky, R.M. Valeeva, A.P. Perevalov, O.S. Poletaev (Ijevsk)

From June 2000 to August 2003 68 PCI were performed in patients with acute myocardial infarction (AMI). Patients selection criteria were as follows: time from the onset of AMI symptoms to arrival at the hospital within 6 hours; patient's consent to intervention. Thirty five case reports of patients with AMI who underwent PCI were analysed. Blood flow in the infarct-related artery was restored (TIMI II-III) in 33 patients (immediate success in 94.3%). ECG showed that ST-segment returned to the baseline within 24 hours follow-up in all these patients, no cases of recurrent anginal attacks were observed. In one case balloon insertion following recanalization failed as this segment of coronary artery was extremely tortuous; in another case occlusive dissection developed after PTCA. No in-hospital mortality was observed.

ENDOVASCULAR INTERVENTIONS IN PATIENTS WITH MYOCARDIAL Q-INFARCTION AFTER SYSTEMIC THROMBOLYSIS

L.L.Klykov, A.A. Filatov, A.Yu.Lebedeva, S.A. Davtian (Moscow)

Forty two AMI patients (34 men (81%) and 8 women (19%), mean age 54+11.6 years) were observed from January 2003 to July 2004. Systemic thrombolysis (TL) was performed with Actilyse in the dose of 100 mg per hour. PTCA and stenting were performed on average within 13.6 + +5.1 days following TL. Mean door-to-needle time for TL amounted to 20 min. Coronary angiography revealed TIMI-3 blood flow in infarct-related artery in 30 patients (71.4%), TIMI 1-2 in 4 patients (9.5%), and TIMI-0 in 8 patients (19%). Complete revascularization with PTA or stenting was performed in all cases. A total of 64 stentings and 6 PTA were performed. In-hospital procedure effectiveness amounted to 100%.

PERCUTANEOUS INTERVENTIONS IN PATIENTS WITH "Q-WAVE" AND "NON-Q-WAVE" ACUTE MYOCARDIAL INFARCTION

V.G. Plekhanov, N.I. Korotkov, Yu.A. Kulikov, D.A. Zoltoev (Ivanovo)

Objectives: to study the effectiveness of PTCA and stenting in patients with "Q-Wave" and "Non-Q-Wave" myocardial infarction (MI).

Materials and methods: Percutaneous interventions were performed in 184 patients with non-Q-wave AMI (group I) and in 198 patients with Q-wave AMI (group II).

Non-transmural anterior AMI was identified in 138 patients of the group I, posterior (inferior) and/or lateral MI - in 46 patients. Symptoms of unstable angina resistant to drug treatment were the indication to urgent intervention in 69 patients. Coronary angiography revealed TIMI I-II blood flow in the symptom-related artery (SRA) in 170 patients, SRA occlusion (TIMI 0) with marked collateral blood flow in 13 patients. In the group II the interventions were performed within the first six hours following the onset of disease; according to the coronary angiography data, SRA was identified as anterior interventricular artery in 130 (52.1%) patients, as right coronary artery - in 61 (30.8%) cases, and as the circumflex artery - in 34 (17.1%) patients. SRA thrombosis (TIMI 0) was determined in 186 (93.9%) patients.

Results: In the group I PTCA was performed in 61 (41.2%) patients, stenting - in 123 (66.8%) patients (86 direct stentings). Initial success was obtained in 180 (97.8%) patients. Intervention failed in 4 (2.2%) patients. Two patients with symptoms of unstable angina died. Exercise testing before discharge from the hospital revealed 142 (78.9%) patients free from angina. In the group II restoration of the SRA

blood flow was achieved in 190 (96%) patients. PTCA was complicated by dissection in 27 (13.6%) patients, all the patients underwent urgent stenting. In-hospital rethrombosis developed in 9 (4.6%) patients. Five (2.5%) patients died.

Analysis of immediate results of coronary reperfusion with percutaneous interventions in patients with AMI demonstrates high effectiveness of this method, as restoration or significant improvement of blood flow in the symptom-related coronary artery prevents major cardiac complications in patients with non-Q-wave MI and reduces infarct area in patients with Q-wave MI.

OPTIMIZATION OF TREATMENT FOR MYOCARDIAL INFARCTION ON THE BASE OF DIFFERENTIATED APPROACH TO REPERFUSION THERAPY

V.V.Meister, S.A.Zavolojin, S.A. Golyshev, V.A. Piatkov (Archangelsk)

Objectives: to give the comparative estimation of in-hospital and one year follow-up clinical course and outcomes of AMI depending on treatment-and-diagnostic tactics, and to develop algorithm for treating patients with acute myocardial infarction (AMI) based on principles of evidence-based medicine under conditions of practical healthcare.

Material and methods: Patients (n=432) arrived in acute period of AMI (within 12 hours) were assigned prospectively in the groups of primary coronary angioplasty (PCA, n=92), thrombolythic therapy (TLT, n=286), and delayed coronary angioplasty (CA) following TLT (TLT+CA, n=54). Mean time from onset of disease to arrival at hospital was 172.3 ± 126.5 min., 168.7 ± 131.8 min., and 181.4 ± 115.9 min. respectively. The groups were comparable in age, sex and concurrent pathology.

Results: In-hospital mortality was lower in PCA group compared with TLT group in patients with AMI severity classes III and IV (by Killip classification) and amounted to 33.3% and 80.2% respectively ($p<0.05$). Reinfarction was observed in 8.7% of patients of TLT group and was absent in PCA and TLT + CA groups ($p<0.05$). In all groups there was no significant difference between in-hospital outcomes in patients with AMI severity classes I and II arriving at hospital within 4 hours after onset of disease. Upon discharge pump function of the left ventricle was significantly improved in PCA group compared with TLT + CA and TLT groups if myocardium reperfusion was performed later than 240 minutes from onset of disease. At one year follow-up there was no significant difference in mortality rate between the groups, it amounted to 1.2% in PCA group, 3.8% in TLT + CA group, and 3.8% in TLT group respectively. Reinfarction rate in PCA and TLT + CA groups amounted to 1.4% compared to 13.1% in TLT group ($p<0.05$). Angina requiring repeated revascularization of myocardium was observed in 2.4% of patients in PCA group, in 3.7% of patients in TLT + CA group, and 11.4% of patients in TLT group ($p<0.05$ between PCA, PCA + TLT and TLT). Total mortality rate and reinfarction rate amounted to 4.8% in PCA group; 9.4% in TLT + CA group and 18.4% in TLT group ($p<0.05$ between PCA, PCA + TLT and TLT groups).

Conclusions: PCA in patients with AMI severity classes III and IV reduces hospital mortality, maintains myocardium function indices, reduces the probability of reinfarction and recurrent angina. TLT + CA method reduces the probability of in-hospital reinfarction, and reduces the probability of reinfarction and recurrent angina within one year follow-up. Clinical and long-term outcomes in TLT patients with AMI severity classes I and II are comparable to those of PCA and TLT + CA groups, so TLT method of myocardium reperfusion can be considered as a basic treatment for this group of patients.

CARDIOPROTECTIVE EFFECT OF INTRACORONARY INJECTION OF CREATINPHOSPHATE IN ACUTE PERIOD OF MYOCARDIAL INFARCTION

D.G.Iosseliani, A.G. Koledinsky, S.P.Semitko (Moscow)

Objectives: to study the eventual cardioprotective effect of intracoronary infused creatinphosphate after the recanalization of infarct-related artery (IRA) in acute myocardial infarction (AMI).

Materials and methods: the study eurolled 20 patients within the first hours after onset of AMI, with acute occlusion of proximal LAD (TIMI 0) who underwent successful IRA recanalization within the first 15 minutes of the procedure. All patients were randomized into two groups: the patients of the first group (n=10) received intracoronary injection of creatinphosphate in the dose of 2 g per 100 ml of saline, while the patients of the second group (n=10) served as control and received intracoronary injection of the same volume of saline. Blood sampling for markers of cardiomyocytes damage (Troponin I, Myoglobin) was performed during recanalization and at 12 and 24 hours postprocedure. Troponin I concentration > 1.5 ng/ml and Myoglobin concentration > 90 ng/ml were considered diagnostically significant. Patients in both groups were not reliably different as for their baseline clinical, anamnestic and angiographic data.

Results: the procedure of myocardial reperfusion was successful in 100% of cases, mortality rate was 0%. In-hospital disease course was uneventful in all patients. There were no differences in postprocedure antianginal and antiaggregant therapy between the groups. Mean concentrations of Troponin I and Myoglobin at 12 hours postprocedure was 65 ± 21 ng/ml and 167 ± 35 ng/ml in the group of intracoronary injection of creatinphosphate vs. 732 ± 54 ng/ml and 387 ± 47 ng/ml in the control group. Thus, Troponin I concentration in the treatment group was next order lower than in the control group. Clinical data suggested more favorable in-hospital course of disease in patients of the treatment group. Left ventricular ejection fraction (LVEF) was 47±8% vs. 35±7% in the control group. Physical tolerance was 94,6 ± 16,4 Wt vs. 50,8 ± 20,5 Wt in the control group.

Conclusions: our study allowed to conclude that intracoronary infusion of creatinphosphate macroerg can exert a positive effect on the prevention of reperfusion mayocardial damage and on the preservation of the viability of hibernated myocardium after restoration of antegrade blood flow in the infarct-related artery within the first hours after the onset of AMI.

«AMI - Optimization of Therapy: Thrombolysis, PTCA, Stenting or Combination of Those Methods?- 2»

PRIMARY ANGIOPLASTY IN AMI WITH ST-ELEVATION

M. Keltai (Budapest, Hungary)

Abstract not submitted.

MYOCARDIAL FUNCTION AND CYTOKINES LEVEL IN PATIENTS WITH AMI IN DIFFERENT TECHNIQUES OF REPERFUSION

S.A. Zavolojin, A.Yu. Valkov, S.V. Golyshev, V.V. Meister, O.A. Miroliubova (Archangelsk)

Objectives: to assess the left ventricular (LV) systolic and diastolic functions and changes in pro-inflammatory cytokines (PC) levels in patients with AMI during the in-hospital period in different techniques of reperfusion.

Material and methods: Two groups of patients with AMI were examined. The first group included patients who underwent thrombolytic therapy (TL, n=123), the second group included patients with thrombolysis optimized by PTCA performed within 2-7 days (TL+PTCA, n=35). The groups were comparable in sex, age, and AMI location and number. Left ventricular systolic function (LV SF) evaluation was performed in all patients at the end of in-hospital period (within 20 - 25 days of stay). Ejection fraction (EF) (in %), LV sizes and volumes, and left atrium (LA) size, (in cm), pulmonary artery pressure (PAP) (in mmHg) were assessed. The indices of left ventricular diastolic function (LV DF) (the peak early transmitral flow velocity (E) and the peak left atrial systolic flow velocity (A) (in cm/sec), E/A ratio, isovolumic relaxation time (IVRT) and deceleration time (DT) of the early diastolic filling (in msec) were assessed by ultrasonography in 15 patients of either group. PC levels (alpha tumor necrosis factor (TNF-alpha) (in pg/ ml) and its soluble receptor type I (SR-I) (in ng/ ml) were assessed on the second day (measurement 1) and on the 23-th day (measurement 2) after onset of disease by immune-enzyme analysis. Coronary blood flow was assessed by coronary angiography.

Results: Coronary blood flow in the infarct-related artery according to TIMI classification differed significantly between the groups: 2.89±0.32 in TL+PTCA group and 2.07 ±1.29 in TL group respectively (p 0.0001). EF was significantly increased in TL+PTCA group compared with TL group (59.54±7.05 and 56.02±9.51 respectively, p = 0.044), PAP was significantly lower in TL+PTCA group (20.7±3.64 and 26.53±7.20 respectively, p <0.0001), and LA size was significantly smaller in TL+PTCA group (3.62±0.37 and 3.81±0.40 respectively, p=0.015), areas of hypokinesia were rarely observed in TL+PTCA group (p=0.052). LV diastolic dysfunction was more pronounced in the TL+PTCA group but there was insignificant difference between groups (p>0.05). There was no significant difference between groups in PC levels on the second day of AMI: TNF amounted to 59.98±30.39 in TL+PTCA group and was 58.04±34.88 in TL group (p=0.872), SR level was 2.42±0.64 in TL+PTCA group and 2.20±0.65 in TL group respectively (p=0.354). By the end of in-hospital period only a slight tendency to higher PC levels remained in TL+PTCA group: TNF level was 49.65±25.61 in TL+PTCA group and 40.97±32.81 in the TL group respectively (p =0.426), SR amounted to 2.62±0.66 in TL+PTCA group and was 2.59±0.79 in TL group respectively (p = 0.887). SR assessment (measurement 2) in TL+PTCA group showed significant difference in SR levels between patients (3.01±0.71 in patients with abnormal IVRT and 2.29±0.41 in patients with normal IVRT, p = 0.03). Upon discharge angina rate was less in TL+PTCA group (p = 0.014).

Conclusions: Upon discharge the systolic function is better in TL+PTCA group, respectively areas of disturbed local contractility are smaller and angina rate is lower. It is probably related to better TIMI coronary blood flow. By the end of in-hospital period the severity of reperfusion disorders is similar in both groups but the TNF-SR system functions more tensely in combined technique of reperfusion.

PARTICULARITIES OF MORPHOGENESIS OF ACUTE MYOCARDIAL INFARCTION IN EARLY RESTORATION OF THE BLOOD FLOW

I.G. Galankina (Moscow)

Early restoration of the blood flow (reperfusion, RP) in the myocardial infarction (MI) area presents significant clinical and morphological features in all stages of MI. Various myocardial structures (cardiomyocytes, vessels and stroma) have various "ischemia threshold". Specific changes of the microcirculatory vessels in RP significantly increase the rate of atypical form of MI - hemorrhagic infarction.

Morphological particularities of MI course in RP result from the combination of positive influence of oxygenated blood on ischemia-resistant myocardial tissues and additional damage of ischemia-sensitive tissues. As a result accelerated reperfusion necrosis of most cardiomyocytes occurs. Some vessels, fibrocytes and stromal fibers remain intact in the central area of infarction, therefore reactive, resorptive and reparative processes go either through the whole area of damaged myocardium and through the peripheral zone, determining processes' acceleration.

Intact stromal structures (vessels, fibrocytes), acting as an additional source of collagen formation, determine the bi-directional reparation process in RP - from the central to peripheral zones and vice versa. This accelerates reparation of myocardial infarction and results in morphological signs of complete myocardial scarring; indicating the doubtless expediency of restoration of blood flow through the area of developing infarction and the necessity of recanalization by every possible method.

CORONARY STENTING IN ACUTE MYOCARDIAL INFARCTION

V. Kucherov, S. Chernov, N. Sokoliansky, Yu. Kutepov, A. Gaydukov (Moscow)

Objectives: to assess immediate and long-term (one year follow-up) results of infarct-related artery (IRA) stenting in patients with acute myocardial infarction.

Methods: from January 1998 to January 2003 infarct-related artery stenting was performed in 95 patients (94 males and 1 female, mean age 56.3 + 12 years). Patient including criteria were the following: chest pain lasting >1 hour, resistant to nitrates with ECG changes in QRS complex and/or persistent ST-segment elevation or depression. Cardiogenic shock was registered in 2 patients (3%).

Results: average time from onset of pain to coronarography and IRA stenting was 6 ± 4.1 hours. IRA lesion location: left anterior descending artery (LAD) in 55 patients (58%), circumflex artery (CA) in 13 patients (14%), right coronary artery (RCA) in 26 patients (27%), left main coronary artery in 1 patient (1%). Single-vessel lesion was observed in 34 patients (36%), two-vessel lesion- in 29 patients (31%), three-vessel lesion in 22 patients (23%). A total of 105 stents (1.1 stent/ stenosis) were implanted. Mean length of stents amounted to 23.4 mm + 4.3, mean stent diameter was 3.4 mm + 0.6. Blood flow restoration to TIMI 2-3 and residual stenosis <30% were considered as criteria of angiographic success of intervention. Intervention was successful in 87 patients (92%). Acute in-stent thrombosis was observed in 5 cases (6%), subacute- in 2 cases (2%). No-reflow phenomenon was observed in 7 patients (8%). Hospital mortality amounted to 4% (3 patients, including both patients with cardiogenic shock). Three patients died within one year follow-up (including one non-cardiac death). Recurrent angina was observed in 27 patients (28%). Transmural myocardial infarction occurred in 4 patients, non-Q-wave myocardial infarction - in 2 patients. Ejection fraction increased from 49+12 up to 54+ 14. Control coronary angiography was performed in 83 patients (87%). Angiographic re-stenosis was revealed in 24% of cases. Fourteen percent of patients underwent angioplasty of stented segment.

Conclusions: IRA stenting is an efficacious method of reperfusion associated with rather low level of in-hospital complications and satisfactory long-term results.

EFFECTIVENESS OF PTCA AND CORONARY STENTING IN PATIENTS WITH TRANSMURAL AND NON-TRANSMURAL AMI

I.S. Grishina, Yu.N. Medova, E.V. Yablonskaya, S.Yu. Preobrajenskaya, E.P. Romanova, A.A. Filatov, L.L. Klykov (Moscow)

One hundred fourteen patients (99 males) aged 30 - 60 years were studied: 78 (69.4%) patients with transmural myocardial

infarction and 36 patients (31.6%) with non-transmural myocardial infarction who underwent successful PTCA or coronary stenting procedures. The follow-up period was 4 - 36 months (mean 8.3+: 6.6). In transmural AMI group 62 patients (79.4%) maintained positive postprocedure angiographic result. Sixty-eight patients (87.3%) maintained improved exertional tolerance; no symptoms of angina or reinfarction were observed. All of them remained able-bodied people. In non-transmural myocardial infarction group positive long-term angiographic result was observed in 33 patients (92%). All the patients demonstrated improved exercise tolerance and absence of reinfarction or recurrent angina. There were no reocclusions or reinfarctions in both groups. However 10 patients (13%) of the first group developed recurrent angina in the long-term period. In the second group recurrent angina was observed in 2 patients (5.5%).

In the long-term period left ventricular ejection fraction (LV EF) was significantly higher in non-transmural infarction group compared to transmural infarction group (57.53+5.0% versus 41.61+7.44%, respectively).

ANALYSIS OF THE COURSE AND THE OUTCOME OF ACUTE MYOCARDIAL INFARCTION UNDER DRUG THERAPY

V.V. Kulakov, O.P. Modnova, O.N. Kaverina, A.O. Agoev, G.I. Bykova, I.V. Andruschenko (Vladivostok)

Purpose of the study was to analyze clinical course, diagnostics, treatment and outcome in patients with acute myocardial infarction (AMI) during hospital stay for the last 15 years. The study enrolled 795 patients (57% men). There were two predominant age groups: 50-59 and 60-69 years (30.1% and 29.6%, respectively). Hospital admission within the first 12 hours after the AMI onset was provided in 42.4% of patients. Repeated MI was diagnosed in 36.9% of subjects. Q-wave myocardial infarction was observed in 44.6% of patients, non-Q-wave infarction - in 55.4% of patients. In the majority of patients (65.9%) the location of MI was LV anterior wall and apex, right ventricular MI was diagnosed in 0.4% of patients. The course of MI was complicated by chronic heart failure in 51.7% of patients, acute heart failure - in 11%, cardiac rhythm and conductivity disorders - in 31.1%, acute aneurysm - in 1%. Recurrent MI was observed in 3.8% of patients.

Hospital mortality rate was 13.8%. Patients who died were predominantly men (52.4%). There were 2 mortality peaks: within the first hours of hospital stay and at days 7-11. The highest mortality rate was in patients with repeated MI. The most common causes of death were cardiac asthma and pulmonary edema in 90.5% of cases, paroxysmal rhythm disorders in 57.1% of cases, acute LV aneurysm or rupture in 16.7% of cases, cardiogenic shock in 10.7% of cases, Dressler's syndrome in 10.7% of cases.

Despite thrombolytic therapy and the possibility to refer some patients for coronary bypass grafting, the rate of mortality in AMI remains high - 13.8%.

COMPARATIVE RESULTS OF STENTING AND PTCA ALONE IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

D.G.Iosseliani, S.V. Rogan, S.P.Semitko, A.V. Arablinsky (Moscow)

The purpose of the study consisted in the evaluation of the effectiveness of treatment of acute myocardial infarction (AMI) using PTCA alone and in combination with the stenting of the infarct-related artery (IRA).

Material and methods: we have studied 514 patients in whom endovascular procedures (EVP) on the IRA were performed within the first hours after the onset of anginal attack from 1997. Among them 101 patients with AMI underwent the stenting of the IRA (group 1). Group 2 consisted of 413 patients with primary PTCA of the IRA. Acute thrombosis and threatening intimal dissection as well as suboptimal result of primary PTCA were the indications for the stenting. The patients in both groups were not significantly different as for their clinical, historical and angiographic data. Repeated coronary angiography was performed in 71 (78%) group 1 patients and in 351 (93, 3%) group 2 patients.

Results: immediate angiographic success (residual stenosis <30%, absence of C-F type dissection and restoration of TIMI 2-3 blood flow) was reliably higher in group 1 patients - 100%; while in group 2 the rate of immediate success was 90,8%. The degree of residual stenosis in both groups after EVP was 11±16% and 33±14%, respectively (P<0,01).

In the long-term follow-up (mean, 8.2±2.4 months) the rate of restenosis (22,5% vs. 32,7%) and reocclusion (4,2% vs. 9,1) of the IRA was reliably lower in group 1 than in group 2 (P<0,05).

Conclusions: the stenting allows for the decrease of the rate of late restenosis and reocclusion in patients with AMI who underwent endovascular procedure on the IRA during the acute stage of the disease.

COMBINATION OF PTCA, STENTING AND INTRACORONARY THROMBOLYSIS IN AMI

A.A. Filatov, I.S. Grishina, L.L. Klykov, V.S. Tatatrinov, Yu.N. Medova, E.P. Romanova, S.Yu. Preobrajenskaya (Moscow)

From 2001 to 2004 183 patients (131 males, aged 30-77 years; mean age 53.4+ 9.5 years) underwent endovascular procedures within 2 to 12 hours after onset of acute myocardial infarction. One hundred thirty-one patients (71.5%) had Q-wave myocardial infarction and 52 patients (28.5%) had non-Q-wave myocardial infarction. Only mechanical recanalization PTCA of the infarct-related artery (IRA) was performed in 101 patients (55.2%). PTCA was optimized with intracoronary thrombolysis (streptase) in 36 patients (19.6%), and with stenting in 6 patients respectively. IRA stenting was performed within the first three days following PTCA in 35 patients (19.2%). Eleven patients (6%) with non-Q-wave myocardial infarction underwent direct stenting of the IRA. Complete recanalization of the IRA as a result of primary PTCA on the IRA and PTCA followed by stenting and additional intracoronary thrombolysis was achieved in 163 patients (89%). In 6% of patients complete recanalization of the IRA was achieved with direct stenting. Complete recanalization of the IRA was not achieved in 9 patients (5%).

COMPARATIVE RESULTS OF PTCA IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION AND CHRONIC FORMS OF CAD

S.V. Rogan, A.V. Arablinsky, S.P.Semitko, M.V. Yanitzkaya, P.Yu. Lopotovsky, D.G.Iosseliani (Moscow)

The aim of the study consisted in the comparison of transluminal balloon angioplasty (PTCA) in patients with acute myocardial infarction (AMI) and chronic forms of CAD.

Material and methods: 648 patients were assigned to two groups according to the nosological form of their disease: group 1 consisted of 413 patients with AMI in whom 432 PTCA procedures were performed; group 2 consisted of 235 patients with chronic forms of CAD who underwent 282 PTCA.

Results: the rate of immediate angiographic success of PTCA (residual stenosis ≤30% with the restoration of TIMI 2-3 blood flow) in the studied groups was 90,8% and 85,4%, respectively. Quantitative angiographic analysis didn't reveal reliable differences between the studied groups: the degree of residual stenosis was 33±14% and 29,7±7,0%, respectively(P>0,05), while minimal lumen diameter (MLD) was 2,12±0,45 mm and 2,3±0,4 mm, respectively (P>0,05).

In the late follow-up the rate of restenosis in the studied groups was 32,7% and 31,9%, respectively (P>0,05), of reocclusion - 9,1% and 13,5%, respectively (P<0,05). The lesion length over 15 mm, stenosis of B2/C type, the degree of residual post-PTCA stenosis, lesion localization in the proximal segment of LAD were predictors for restenosis.

Conclusions: There is no significant differences between the long-term results of PTCA in patients with chronic forms of CAD and acute myocardial infarction. The rate of restenoses and reocclusions of the treated coronary artery is about the same in all of them.

OPTIMIZATION OF THE TACTICS OF CARE FOR THE PATIENTS WITH MYOCARDIAL INFARCTION AFTER THROMBOLYTIC THERAPY

A.Yu. Lebedeva, L.L. Klykov, A.A. Filatov, E.V. Petrova (Moscow)

The purpose of the study was to determine clinical and biochemical risk markers for recurrent coronary disorders after thrombolytic therapy. Lipid peroxidation indices were used as biochemical markers.

Materials and methods: Thirty-five patients with Q-wave myocardial infarction aged 35-74 years, who underwent coronary angiography following thrombolytic therapy were studied. Early postinfarction angina and reinfarction rates were assessed.

Intensity of lipid peroxidation (LPO) was determined by plasma level of malonic dialdehyde (MDA). Erythrocyte superoxide dismutase (SOD) and glutamine peroxidase (GPO) were considered as markers of antioxidant protection. These values were assessed at the 1st and at the 5th days of the disease.

Results: Nine patients (25,7%) developed early post-infarction angina, 4 patients (11,4%) developed reinfarction. Coronary angiography revealed either severe residual stenosis or coronary artery occlusion in patients with complicated course of the disease. Inverse relation between MDA level and the indices of antioxidant protection (SOD and GPO) was revealed when comparing patients with complicated and non-complicated myocardial infarction, respectively. MDA level increase by 21,6% and a tendency towards decreased activity of the antioxidant enzymes were observed in patients with recurrent coronary disorders at the 5th day. Correspondingly, MDA level increase by 15,4% and a tendency towards high levels of SOD and GPO were observed in patients with non-complicated myocardial infarction.

Conclusions: Dynamics of LPO indices in patients following thrombolytic therapy can serve as a marker of a complicated course of myocardial infarction.

STATE OF INFARCT-RELATED ARTERY (IRA) IN LONG-TERN FOLLOW-UP AFTER ENDOVASCULAR REPERFUSION, PERFORMED IN THE ACUTE STAGE OF THE DISEASE

S.V. Rogan, S.P. Semitko, A.V. Arablinsky, D.G. Iosseliani
(Moscow)

Purpose of the study: to evaluate the state of infarct-related artery (IRA) with successfully restored antegrade blood flow in the late follow-up (in average 8 months).

Material and methods: the Group 1 comprised patients with AMI (n=101) in whom a successful procedure of IRA stenting was performed within the first hours after the onset of anginal attack; the Group 2 comprised patients with AMI (n=99) in whom a successful procedure of IRA stenting was performed at the later (up to 21 days) stahe of the disease. The studied groups didn't significantly differ as for their clinical and historical data. The information concerning the state of patients was received after 8,2±2,7 months from 91 patients of the Group 1 and after 7,6±1,8 months from 94 patients of the Group 2.

Results and conclusions: the rate of in-stent stenosis in the studied groups was 26,8% and 31,4%, respectively. In 21,0% and 22,7% of cases, respectively, there was a local (up to 10 mm) stenosis; in another 36,8% and 36,3% there was a diffuse stenosis (over 10 mm), not exceeding the stent's edges. In the remaining 26,3% and 18,2% there was a diffuse-proliferative stenosis (over 10 mm and exceeding the stent's edges). In 15,8% and 18,2%, respectively, total IRA occlusion was revealed (TIMI 0). The correlation analysis showed that initial B2/C-type of the stenosis; the presence of calcification and ostial lesion; proximal localization; the presence of well-developed collaterals in the IRA pool; the lesion's length of 15 mm and more; stent diameter of 2,75 mm and less; low pressure of stent implantation (7,5 Atm.); coil stent are the factors of in-stent stenosis and occlusion of the IRA

«Interventional Cardioangiology in Pediatric Practice»

USE OF AMPLATZER DEVICE FOR THE RELIEF OF CONGENITAL SEPTAL DEFECTS AND PATENT DUCTUS ARTERIOSUS

B.M.Shukurov, A.P. Dushkina, G.V. Kozlov (Volgograd)

A total of 20 patients were operated for atrial septal defect (ASD) (10 cases) or large patent ductus arteriosus (PDA).

Sixteen (16) patients were female. The age ranged from 2 to 38 years. All procedures were performed in interventional radiology unit under fluoroscopic guidance.

All ASDs were secondary, the size of defect was 12 to 26 mm. Hemodynamic changes in pulmonary circulation in all patients corresponded to grade II pulmonary hypertension (classification introduced by V.I. Burakovsky and L.R. Plotnikova in 1978). Seven ASD repair procedures were performed under double control (echocardiography and fluoroscopy), including three procedures with transesophageal echocardiography.

Large PDA was repaired in 7 cases, including 3 cases of embolization performed for recanalization of previously ligated ducts. Diameter of ducts ranged from 5 to 10 mm. In all patients the blood shunting was eliminated and the devices effectively secured. No complications were observed during the long-term follow-up (6 to 12 months).

Therefore, our first experience with Amplatzer devices for ASD and large PDA repair showed good immediate and long-term results.

DIAGNOSTICS AND TREATMENT OF CONGENITAL HEART DISEASES IN SMALL CHILDREN

A.F. Khamidullin, P.N. Grebnev, R.I. Garaev, M.F. Bikmullin, L.M. Miroliubov (Kazan)

A total of 42 children (26 boys) below 1 year of age (including 16 children below 1 month) were examined in the Interventional Radiology Unit of Republican Pediatric Clinical Hospital, Republic of Tatarstan Ministry of Health. Most children with CHD were in critical condition due to central hemodynamic disorders. Catheterization of heart chambers, angiocardiography, angiotensiometry, and blood oxymetry revealed complete transposition of great arteries (TGA) in 10 children, ventricular septal defect (VSD) with severe pulmonary hypertension in 14, Fallot's tetralogy in 5, pulmonary stenosis (PS) in 4, aortic stenosis in 2, hypoplastic left heart syndrome in 2, atrial septal defect (ASD) with total anomalous pulmonary veins drainage in 2, ASD with severe pulmonary hypertension in 2, pulmonary trunk atresia in 1. Closed atrioseptotomy (Ruschkind procedure) for transposition of great arteries was performed in 6 patients aged 2 days to 2 months. Pulmonary valve stenosis was revealed in 4 patients aged 6 months to 1 year. Three children underwent transluminal balloon valvuloplasty (TLBVP). TLBVP was also performed in children with aortic stenosis.

Conclusions:

1. Early diagnosis, immediate transportation to specialized cardiacsurgery unit, exact topical diagnosis and timely surgical intervention in newborns and small children with congenital heart disease ensure the decrease of mortality rate in this patient group.
2. Catheter atrioseptotomy gives a possibility to survive critical stage of the disease and to achieve the age, when the risk of hemodynamic and anatomical correction of heart disease is minimal.
3. Transluminal balloon valvuloplasty provides a less invasive and more safe way to eliminate pulmonary stenosis and restore normal pulmonary circulation.

RADIOFREQUENCY CATHETER ABLATION OF NON-CORONAROGENIC VENTRICULAR ARRHYTHMIAS IN THE LEFT VENTRICULAR OUTFLOW TRACT IN CHILDREN

S.A. Termossessov, R. Garipov, I.L. Ilyich, V.V. Bereznitzkaya, E.A. Artiukhina, D.V. Demianov, O.V. Gudina (Moscow)

Purpose of the study was to assess the efficacy and safety of radiofrequency catheter ablation (RCA) of ectopic activity in left ventricular outflow tract (LVOT) in children.

Materials and methods: the group of patients included 13 children aged 13 to 17 years (mean age 15.3 years) with symptomatic idiopathic ventricular extrasystoles and/or ectopic ventricular tachycardia. Preoperative and postoperative examination included ECG, EchoCG, HM-ECG, superficial mapping; follow-up duration was 1 to 12 months. All patients underwent interventional electrophysiological study and RCA of the arhythmogenic LVOT focus. LVOT was reached through transaortic approach. We used isopotential and/or stimulation mapping. During radiofrequency application near the origin of coronary artery (>1.2 cm) the position of ablation electrode was controlled with fluoroscopic guidance and contrast study.

Results: electrophysiological study revealed ectopic activity in LVOT in the right Valsalva sinus (2 patients, 15.4%), left Valsalva sinus (10 patients, 84.6%). Mapping showed maximum advance as compared to superficial ECG to be 43 to 89 ms. Radiofrequency application was performed at 50 - 55 °C, the ectopic activity was completely reduced within the first seconds of the procedure. Mean time of RCA was 1.55 + 1.15 min in the left Valsalva sinus with fluoroscopy time of 20.1 + 14.5 min and 1 to 14 min in the right Valsalva sinus (mean time 7.3 min) with fluoroscopy time of 52 to 97 min (mean time 74.3 min). Total efficacy of RCA in Valsalva sinuses was 100%. Despite the temporary disappearance of ectopic activity during the intervention, one patient had no ectopic acitvity in the right Valsalva sinus 6 months after the intervention, which was due to the delayed effect of RCA. Follow-up during 1 to 12 months showed no recurrent extrasystoles or tachycardia. There were no postoperative complications.

Conclusions: RCA of ectopic focus located in Valsalva sinus is a highly effective and safe method to treat ectopic idiopathic ventricular extrasystoles and tachycardia originating from LVOT.

DIAGNOSTICS AND TREATMENT OF VASORENAL HYPERTENSION IN CHILDREN

A.F. Khamidullin, A.A. Akhunzianov, R.I. Garaev, M.F. Bikmullin (Kazan)

The study enrolled 88 children with arterial hypertension as a leading symptom. Mean age of patients was 14 years. There were 55 boys. Along with conventional diagnostic methods we used ultrasound Doppler study of renal vessels, renovasography, and invasive measurement of blood pressure and pressure gradient in renal vessels and aorta.

Assessment of vascular changes seen on renovasography revealed fibromuscular dysplasia of renal arteries (FMD) in 13 children, main trunk hypoplasia with focal renal atrophy in 30, main trunk dysplasia with focal renal atrophy in 23, focal dysplasia of intraorganic branches in 8, nephroptosis in 10, and Ask-Upmark kidney in 1 child. Of the 13 children with FMD 10 had unilateral disease, 3 children - bilateral disease, including 2 children with critical stenosis of renal artery with hypertension up to 180-200/100-110 mm Hg. Eleven (11) patients (85%) underwent endovascular dilation of renal artery according to the established procedure using COOK balloon catheters. Stable remission has been observed during 2 years following dilation in 5(45%) of these patients. In the remaining 6 children (55%) hypertension recurred and necessitated surgery.

Conclusions:

1. Arterial hypertension is a major pediatric problem.
2. High prevalence of arterial hypertension emphasizes the need for screening.
3. Endovascular X-ray-guided dilation of renal artery must be regarded as the first stage of FMD treatment.

IMMEDIATE AND LONG-TERM RESULTS OF COIL OCCLUSION OF PDA

A.P. Perevalov, O.S. Poletaev, E.Yu Ivanova, V.N. Gureeva, E.V. Sterkhova (Ijevsk)

A total of 122 patients, including 83 girls (68%) underwent endovascular occlusion (EO) of patent ductus arteriosus (PDA) in Interventional Radiology Department of Ijevsk Regional Clinical Hospital N3. The age of patients was 8.5 months to 49 years. In 7 children with concomitant CHD EO of PDA was performed as the first stage of surgery. As a rule, PDA occlusion was performed with a single spiral (113 patients). Two spirals were used in 4 patients (3.3%), three - in 2 patients (1.65%). In 3 patients with arterial duct diameter

below 1 mm PDA was occluded without spiral. We believe, that spontaneous closure of small ducts is attributed to PDA spasm causing its thrombosis following catheter and guidewire manipulation. Simultaneous EO of PDA and endovascular dilation of aortic coarctation was performed in 2 patients (1.6%).

One hundred and thirteen (113) patients (92.6%) were ambulatory at day 2 following EO of PDA. Postoperative complications were observed in 9 children (7.4%): of these, 6 had puncture site complications (soft tissues hematoma, arterial thrombosis). A child with concomitant neurological disorder developed a cerebrovascular accident in the early postoperative period (0.8%). Two patients (1.6%) with spiral dislocation towards pulmonary artery during the procedure another spiral was used to close the duct. In one child (0.8%) dislocation of spiral occurred in the early postoperative period. He subsequently underwent successful EO of PDA using a larger spiral. The above complications occurred during the first procedures performed in the hospital. In 10 (8.2%) patients had intraoperative residual shunting to pulmonary artery trunk. Follow-up echocardiography was performed in all patients 2-3 months after surgery. One patient (0.8%) required additional implantation of another spiral. Postoperative hospital stay after EO of PDA was 3 days. No long-term complications were detected in patients with spiral dislocation to pulmonary artery.

In conclusion, EO of PDA below 4 mm in diameter is highly effective and least invasive. This method ensures substantial decrease of hospital stay and the cost of rehabilitation.

IMPLANTABLE CARDIOVERTERS-DEFIBRILLATORS IN THE TREATMENT OF CHILDREN WITH LIFE-THREATENING VENTRICULAR ARRHYTHMIAS

S.A. Termossessov, M.A. Shkolnikova, R. Garipov, I.L. Ilyich, O.V. Gudina (Moscow)

Purpose of the study was to assess the first experience with artificial cardioverter-defibrillator (ACD) in children with congenital life-threatening rhythm disorders.

Materials and methods: the group of operated patients included 4 children (3 boys) aged 9 - 17 years (mean age 12.5 years) with congenital life-threatening rhythm disorders causing collapses. Of these 3 children were followed-up for catecholamine ventricular tachycardia, another child had congenital syndrome of QT elongation. Despite the antiarhythmic therapy all patients had repeated collapses, which were the indication for ACD implantation. Prior to and following ACD implantation all children underwent invasive electrophysiological study. Antiarhythmic therapy was continued after ACD implantation. Within the 9-month follow-up 1 patient with congenital QT elongation had a single case of ACD stimulation 2 months after implantation. The child had an episode of ventricular fibrillation, which was successfully managed by 14 J dishcarge.

Conclusions: Recurrent collapses during chronic antiarhythmic therapy in children with congenital life-threatening rhythm disorders are the indication for ACD implantation. Implantation of ACD is a highly effective method of secondary prevention of sudden cardiac death in children with life-threatening rhythm disorders.

CHOOSING THE METHOD OF SURGERY FOR VARICOCELE IN CHILDREN AND ADOLESCENTS.

S.N.Strakhov, I.V. Burkov, E.L. Vishnevsky, Z.M. Bondar, N.B. Kossyreva, S.S. Korenkova (Moscow)

During the last 3 years 138 patients underwent left-sided phleborenotesticulography and tensiometry of the inferior vena cava and both renal veins for the identification of the group of candidates for modern-type operations: minimally invasive surgical intervention (veins' occlusion) under local anesthesia, the operation of intervenous anastomosis and the standard Ivanissevich operation.

Normotension (left renal venous pressure <10 mm Hg, left renal vein / inferior vena cava pressure gradient ≤3 mm Hg) was revealed in 90 patients. In 58 of them a minimally invasive operation was performed: endovascular occlusion of the left testicular vein with the infusion of 10 ml of 3% thrombovar solution through coaxial catheter placed in the upper third of the left testicular vein, after finger compression of the spermatic cord's veins at the external ring of the inguinal canal.

In 32 normotensive patients atypical localization of the testicular veins' ostia was revealed, which made impossible the placement of the coaxial catheter. Those patients underwent Ivanissevich operation.

Marked aorto-mesenterial compression or left renal vein stenosis with phleborenohypertension (left renal venous pressure varying from 10/8 to 30/28 mm Hg, interventous gradient varying from 4 to 23 mm Hg) were diagnosed in 48 patients.

42 patients with phleborenohypertension underwent surgical creation of proximal left-sided testiculo-iliac venous anastomosis.

Distal testicular vein in the form of multiple thin branches, not opacified during phleborenotesticulography, was revealed intraoperatively in 6 patients. Those patients underwent Ivanissevich operation.

In the follow-up 2 patients with 3rd degree of varicocele presented with 1st degree recidivation after endovascular occlusion of the testicular vein and 1 patient presented with 1st degree recidivation after Ivanissevich operation.

There were no cases of varicocele recurrence after the creation of proximal testiculo-iliac anastomosis. One patient had scrotum edema.

Ultrasound Dopplerography showed total patency of the intervenous anastomosis in 18 of 20 studied patients, in 2 cases partial anastomosis' thrombosis was revealed.

«Endovascular Interventions on the Abdominal Aorta and Its Branches»

ENDOVASCULAR SURGERY OF THE TERMINAL AORTIC SEGMENT

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P.Dundua, A.M. Babunashvili (Moscow)

Purpose: to assess the immediate and long-term results of recanalization and angioplasty of isolated chronic occlusions of terminal aortic segment.

Materials and methods: A total of 13 patients were treated. Mean age was 59.1 years. All patients underwent recanalization of terminal aortic segment occlusion. Mean occlusion length was 7.9 cm. Nineteen (19) stents were implanted (2 Wallstemt and 17 ZA stents)

Results: Good immediate results were observed in all patients. Mean hospital stay was 2.5 days. Early postoperative complications included soft tissue hematoma at the puncture site in 1 patient, which was managed medically with compression bandage. Lomg-term results (up to 7 years of follow-up) were assessed in 9 patients. Primary patency was found in 7 patients, stenosis was found in 2 patients, no cases of occlusions were observed. The patients underwent successful repeated angioplasty with blood flow restoration.

Conclusion: Recanalization and stenting of terminal aortic segment provides successful immediate and long-term results in most patients. The benefits include no need for general anesthesia and abdominal approach, lower cost of treatment and mortality rate, short time of procedure and hostital stay, maintaining or improvement of sexual function in men. Such patients must be closely observed in an outpatient clinic with mandatory measurement of ankle-brachial index at least once per year.

RESULTS OF ENDOVASCULAR INTERVENTIONS FOR THE TREATMENT OF OCCLUSIVE DISEASES OF THE AORTA AND ITS BRANCHES

B.M.Shukurov, G.V. Kozlov (Volgograd)

We performed 27 endovascular interventions. The age of patients ranged from 8 months to 62 years. Four (4) children underwent aortic coarctation angioplasty, one child aged 8 months and weighing 6.5 kg underwent simultaneous angioplasty of aortic coarctation and balloon valvuloplasty of aortic stenosis via axially approach. The procedures resulted in the mean decrease of systolic arterial pressure gradient from 76±18 mm Hg to 33±15 mm Hg and a 20 mm Hg decrease (from 70 mm Hg to 50 mm Hg) after valvuloplasty.

Six (6) patients underwent balloon angioplasty of renal arteries, two of these required stenting. Mean preoperative stenosis degree was 80±10%, mean pressure gradient was 70±20 mm Hg. All patients had marked symptoms of arterial hypertension with mean blood pressure of 215±10 and 120±5 mm Hg. Endovascular procedure resulted in good angiographic and clinical effect. Mean values of residual stenosis degree were 10%±5% with pressure gradient of 18±7 mm Hg. Blood pressure was stable at 150±10 and 90±10 mm Hg.

Twelve patients underwent balloon angioplasty of subclavian arteries, another 3 patients - balloon angioplasty of lower limb arteries, including stenting of the external iliac artery in one patient. Mean preoperative stenosis degree was 80±10%. All patients had clinical signs of limb ischemia. Mean residual stenosis was 20%±5%. No complications were observed.

Conclusion: endovascular interventions for diseases involving aorta and its branches are effective and ensure high rate of clinical success. Strict maintenance of the procedure technique improves its hemodynamic effect.

RESULTS OF ENDOVASCULAR TREATMENT OF THE ABDOMINAL AORTIC ANEURYSMS WITH LINEAR STENTS

V.A. Ivanov, Yu.A. Bobkov, S.A. Terekhin, V.A. Veretenin, A.V. Ivanov, S.V. Volkov, I.V. Trunin, I.V. Mostovoy, S.S. Slovakovsky, V.L. Smirnov (Krasnogorsk)

Between December 1995 and July 2004 a total of 31 patients (30 men) underwent implantation of 36 stents, of these 2 stents were implanted for false aneurysm of aortic graft anastomosis. In all patients the disease was caused by atherosclerosis. The majority of patients were aged over 70 (54,3%).

Of the 36 stents implanted 25 were self-expanding nitinol braided stents (21 stents with polyethylene coating, 4 stents without coating), 10 - Endomed endografts (Kiev) with Ecoflon coating (St.Petersburg), and in 1 case a Cook endograft was used. Self-expanding nitinol braided stents were implanted percutaneously through 12-14F introducer, whereas Endomed and Cook endografts - through arteriotomy approach. All interventions were performed under local anesthesia.

Immediate and long-term results were assessed within 3 months - 8 years postoperatively. In 23 cases immediate clinical and angiographic success was achieved. Early postoperative complications were found in three patients. One patient had occlusion of the common iliac artery origin, which required transverse femoro-femoral bypass grafting. Occlusion of the renal artery causing persistent renal hypertension occurred in another patient during stent implantation. In a single patient stenting was complicated by endograft thrombosis, therefore conventional surgery was performed. Perigraft endoleakage was found in 5 cases.

There were 4 patients who underwent repeated stenting within 2 months - 3 years postoperatively and 1 patient who underwent two additional procedures at 5 months and 3 years, respectively. In 4 cases repeated endovascular stenting was aortic stent-graft endoleakage.

In conclusion, we believe that roentgenoendovascular interventions on the infrarenal aorta are an effective and minimally invasive method of surgical treatment, especially in elderly patients. However, this treatment requires further improvement of the design of aortic stents and decrease of delivery systems' diameter.

ENDOGRAFTING OF THE ABDOMINAL AORTIC ANEURYSMS

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P.Dundua, A.M. Babunashvili (Moscow)

Purpose: to assess the results of clinical use of nitinol self-expanding drug-eluting stents in the treatment of infrarenal aneurysms of the abdominal aorta.

Materials and methods: endografting of the aneurysms of the abdominal aorta with the use nitinol self-expanding drug-eluting stents was carried out in 85 patients.

Among them 11 patients underwent bifurcational endografting.

Mean age of patients was 76 7 years.

In 79 cases we used percutaneous approach with delivery system 14-16F.

We used the originally designed stents with Dacron coating (on the base of ZA-stent and in one case - with "commercial" system (Zenith).

Results: good immediate results (complete isolation of the aneurysmatic cavity, absence of distal and proximal leakage) were noticed in 92% of patients. Bifurcational stents were implanted in 11 cases, while in 4 cases endografting of the aortic aneurysm was performed with the passage to one of the iliac arteries with crossed femoro-femoral bypass and embolization of the contra lateral iliac artery.

Long-term results were followed in all cases for 2 - 72 months.

Conclusion: the evaluation of immediate and long-term results of endografting of the aneurysms of infrarenal abdominal aorta with the use of drug-eluting self-expanding stents shows the perspectives of this method and allows to use it as an alternative to open reconstructive surgery at the condition of satisfying strict criteria for patients' selection. Bifurcational endografting of the aneurysms is the method of choice.

ENDOVASCULAR TREATMENT OF THE GREAT ARTERIES IN PATIENTS WITH MULTIFOCAL ATHEROSCLEROSIS

V.N. Perepelitzyn, O.G. Karakulov (Perm)

We performed PTA of 627 arteries in 451 patients with multifocal atherosclerosis (age ranged from 42 to 81 years) between 1992 and 2004. Lesions were located in the following arterial segments: infrarenal abdominal aorta in 1 case, common iliac artery in 156

cases, external iliac artery in 322 cases, common femoral artery in 25 cases, superficial femoral artery in 91 cases, deep femoral artery in 4 cases, popliteal artery in 16 cases, anterior tibial artery in 1 case. Seventeen patients (17) underwent repeated PTA in the same or another vascular territory. PTA of a single artery was performed in 300 (66.5%) patients, two arteries - in 95 (21.1%), three arteries - in 35 (7.8%), four arteries - in 19 (4.2%), five arteries - in 2 (0.4%).

The following complications were observed: PTA of iliac, femoral and popliteal arteries was associated with 18 (2.9%) cases of dilated artery thrombosis, 5 (1.1%) cases of distal embolism, 3 (0.7%) cases of thrombosis of the artery used for endovascular approach.

In conclusion, PTA of large arteries of the lower limbs in patients with multifocal atherosclerosis is one of the possible treatment options. The frequency of complications after PTA is similar to that of conventional surgery.

TRANSRADIAL APPROACH IN THE DIAGNOSTICS OF ATHEROSCLEROTIC LESIONS OF AORTO-ILIAC SEGMENT

Yu.V. Suslin, A.N. Androssov (Samara)

Since 1999 in the Department of Interventional Radiology we have introduced transradial approach for diagnostic and therapeutic procedures in patients with stenosis or occlusion of aortoiliac segment and patients, who underwent aortofemoral grafting or bypass reconstruction. A total of 96 angiography procedures were performed. There were 91 male patients. In 9 patients the procedure was conducted in an out-patient clinic.

Prior to the use of transradial approach Allen's test was performed to define whether the collateral blood flow from ulnar artery via palmar arch was sufficient. Negative test result was a contraindication to this approachas well as the absence of pulse on the ulnar artery and small diameter of the ulnar artery.

The procedure was performed with 5-7 F (1.65 мм) catheters and introducers, 0.035 mm J-guidewires. Left transradial approach was performed in 89 patients, right transradial approach - in 7 patients. Long-term repeated pucture of the same vessel after angiography was performed in 3 patients.

The manipulation was performed under general anesthesia with novocaine or lidocaine. Pucture site was located 3-4 cm above the pr. styloideus of radius. If the puncture was unsuccessful, repeated puncture was undertaken 1-2 cm proximal. Standard J-guidewire was replaced with soft or hydroophilic guidewire in spasm of radial or ulnar artery occurred. Hemostasis was secured by digital compression and compression bandage after serial angiography and the removal of instruments from the arterial lumen.

No cases of hemorrhage or pulsative hematoma were observed during hospital stay. In addition, there were no clinical events due to radial artery catheterization.

Conclusion: Transradial approach for endovascular procedures is effective, safe and has a number of benefits: no need for strict bed regimen, the possibility of out-patient angiography, the method is psychologically more preferred by patients.

OUR FIRST EXPERIENCE WITH BIFURCATIONAL STENTING OF THE ABDOMINAL AORTIC SEGMENT

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

Purpose: To review the first experience with bifurcational stents for abdominal aortic aneurysm repair.

Materials and methods: Since 2003 we have performed bifurcational stenting of the infrarenal aorta in four patients at the Russian Research Center of Surgery. Mean age of patients was 63 years. All patients had a long history of hypertension and CAD. Two patients had symptoms of renal failure. In two patients the aneurysm extended to the iliac arteries and required stenting of the iliac arteries. Talent stents (Medtronic, USA) were implanted in all patients. Stenting was performed via transfemoral bilateral arteriotomy approach.

There were no cases of dislocation or twisting after stenting. Follow-up angiography showed patent renal and visceral arteries with no signs of endoleak. No early complications were observed. Three patients underwent follow-up examination study 6 months after surgery, which included ultrasound study and computed tomography. No cases of stent dislocation or twisting were revealed. There were no signs of endoleak.

Conclusion: The use of Talent bifurcational stents (Medtronic, USA) is highly effective and minimally invasive method of abdominal aortic aneurysm repair.

ENDOVASCULAR SURGERY FOR LERICHE SYNDROME

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P. Dundua, A.M. Babynashvili (Moscow)

Purpose: To assess the efficacy of recanalization and angioplasty (PTA) for bifurcational stenosis or occlusion of aortoiliac segment.

Materials: We have treated 155 patients with such condition. Mean age of patients was 58.2 2.1 years. There were 102 patients with grade 2 chronic limb ischemia and 53 patients with grade 3-4 chronic limb ischemia. Examination showed common iliac artery occlusion in 50 patients, external iliac artery occlusion in 67 patients, occlusion of common and external iliac arteries in 18 patients; there were 157 cases of stenosis of common and external iliac arteries. All patients had bifurcational lesions. In addition, 102 patient (65.8%) had significant changes of distal vasculature.

Recanalization was performed with hydrophilic guidewires. PTA was accompanied by stenting. A total of 632 stents were implanted.

Results: Immediate success was achieved in 93% of patients. Only a single patient had thrombosis at the site of PTA requiring bypass surgery. Long-term outcome (up to 5 years) was assessed in 76 patients. The absence of flow-limiting lesions within at site of prior intervention was confirmed in 84% of patients. In 6 patients we found flow-limiting stenosis at the site of PTA (7.9%). Four (4) patients had reocclusion (5.3%). Successful repeated PTA was performed in case of restenosis. In conclusion, long-term success calculated with the account of successful repeated PTA was 94.7%.

Summary: Endovascular recanalization for Leriche syndrome is possible regardless of the length and history of occlusion. These results are similar to the outcome of reconstructive surgery at this area, however, recanalization with PTA and stenting must be preferred due to minimal invasiveness.

«Interventional Radiology in Oncology - 2»

POSSIBILITIES OF INTERVENTIONAL RADIOLOGY IN ONCOLOGY

B.I. Dolgushin, (Moscow)

Interventional radiology (IR) is a rapidly developing branch of oncology, which extends possibilities of routine diagnostic methods to introscopy-guided interventional procedures (Fluoroscopy, ultrasonography, X-ray computed tomography, magnetic resonance imaging).

Objectives: to show the possibilities of interventional X-ray procedures in the oncology clinic.

Materials and methods: most common interventional X-ray procedures in oncology are the following:

- Biopsy (aspiration biopsy, brush biopsy and forceps biopsy),
- Drainage of pathologic and physiologic fluids (leakages, hematomas, abscesses, cysts, biliary ducts, urinary tract),
- Dilation of lumens (dilation of gastrointestinal tract strictures, urinary tract strictures, and airway strictures),
- Prostheses implantation in tubular organs (vessels, biliary ducts),
- Embolization or embolic therapy (induced ischemia and chemotherapy on the tumor masses),
- Anastomoses (magnetic and needle anastomoses promoting passage of physiological and pathologic substances),
- Removal of foreign bodies (detached catheters in the vessels, ducts etc.),
- Implantation of vena cava-filters for embolism protection during and following extensive surgery in severe oncology patients,
- Hemostasis (transcatheter embolization of bleeding vessels and vascular fistulas following surgeries and IR procedures),
- Vertebroplasty with special bone cement for damaged vertebral bodies,
- Thermal radioablation of tumors.

Results: IR procedures are performed under fluoroscopic, ultrasonographic or CT guidance or the combination of these methods. One should choose the method to provide the best visualization of the pathologic process and to determine approach to it. If methods are equally informative, the simplest and cheapest method is to be chosen or the one, in which the interventional radiologist is mostly skilled. Interventions are commonly performed under local anesthesia and premedication. About one thousand various IR procedures not counting aspiration biopsy procedures are performed annually at the Russian Cancer Research Center.

Conclusion: unlike routine surgeries radiological interventions don't require narcosis; patients demonstrate better tolerance to procedures. Less postprocedure complications occur, procedures can be easily reperformed and they are inexpensive.

As the technical progress develops, interventional radiology will widen its fields of application. Combining fine surgical possibilities and accurate determination of beam direction interventional radiology has big future in oncology.

ENDOVASCULAR INTERVENTIONS IN PATIENTS WITH JUVENILE ANGIOFIBROMAS OF THE SKULL BASE

D.P. Stoliarov, A.V. Protopopov, T.A. Kochkina, E.P. Konstantinov (Krasnoyarsk)

Purpose of the study: To assess the efficacy and safety of embolization of the blood-supplying artery of skull base juvenile angiofibroma for the prevention of intraoperative blood loss.

Materials and methods: To decrease the blood supply of juvenile angiofibroba of the skull base in 31 patients we performed cerebral angiography with simultaneous embolization of efferent vessels of the tumor using teflon or PVA microemboli.

Results: Angiofibromas received blood from branches of the internal carotid artery (ICA) and external carotid artery (ECA) on one or both sides.The main source of blood supply in all patients were distal branches of maxillar artery on the side of predominant tumor growth. The adjacent areas of angiofibroma received blood from ascending pharyngeal (35.5%) and ascending palatine (19.3%) arteries. ICA carried blood to the upper areas of tumor in basilar and ethmoid sinus in 22.6% of patients regardless of the presence of intracranial growth. Embolization was performed in ECA territory. We used two basic embolization methods - through a diagnostic catheter or a coaxial system with a micro-catheter. We currently prefer to use microcatheters, as they provide more selective and complete embolization of efferent vessels along with minimal injury to intact tissues. Angiofibroma was surgically removed in 28 patients (90.3%). Bleeding occurred only during separation of the tumor and ceased spontaneously in all cases. There were no complications after endovascular interventions or surgery. Mean blood loss was 446,43±77.06 ml. Follow-up during 1 to 8 years revealed recurrent tumors in 14.3% of patients.

Conclusions: Embolization safely and effectively decreases vascularization of juvenile angiofibroma of the skull base and facilitates their radical removal with moderate blood loss and low rate of recurrences.

INTRA-ARTERIAL CHEMOEMBOLIZATION OF MALIGNANT NON-OPERABLE TUMORS

B.I. Dolgushin, E.R. Virshke, G.A. Kuchinsky, E.M. Roschin (Moscow)

About 80% of patients with liver carcinoma were inoperable at presentation. This has required the development of new medical therapies for liver carcinoma, which would be based on both new anticancer agents or new delivery methods.

We use intraarterial chemoembolization based on anticancer effect of a cytostatic and ischemia due to embolization of tumor vessels for the treatment of inoperable liver carcinoma. Chemoembolization was applied in 163 patients, 89 of these had primary malignant tumors of liver and the remaining 74 had hepatic metastases. Super-selective injection of chemoembolization mixture into hepatic arteries is mandatory during the procedure. This is achieved by super-selective catheterization of a. hepatica propria or lobar hepatic arteries. Inability to perform super-selective catheterization required prolonged regional intraarterial infusion in 12% of patients, in whom we attempted chemoembolization.

The best treatment outcome was achieved in patients with highly vascularized tumors (hepatocellular carcinoma, carcinoid tumor or metastases from breast cancer). Therapeutic effect was observed in 36.2% of patients with primary hepatic carcinoma. Mean survival was 18.5 ± 3.7 months. Partial effect was demonstrated in 42.8% of patients with metastases from breast cancer. No apparent regression of tumor was found in patients with metastases from gastric, colic or rectal carcinoma.

Chemoembolization has more pronounced therapeutic effect, lower toxicity and tolerability as compared to other medical therapies for inoperable hepatic tumors. The above benefits suggest, that chemoembolization can be recommended as a method of choice for inoperable hepatic carcinoma.

INTERVENTIONAL RADIOLOGICAL APPROACHES IN THE TREATMENT OF POSTOPERATIVE ABDOMINAL ABSCESSES IN ONCOLOGICAL PATIENTS

B.I. Dolgushin, E.R. Virshke, V.A. Cherkassov, V.Yu. Kossyrev, A.G. Margarian (Moscow)

Postoperative abdominal abscesses are a relatively rare complication of abdominal surgery and occur in 0.35 - 1.8% of cases. At the same time, they are difficult to be diagnosed, have complicated course and severe consequences in the majority of cases. Despite the use of minimally invasive approaches, highly effective antibiotics and the advances of anesthetic management, surgical drainage of abdominal abscesses is still associated with high mortality (10% to 40%). Conventional surgery aimed at drainage of abscesses can contribute to aggravation of initially severe condition of oncological patients.

Since 1998 we have practiced closed treatment of abdominal abscesses using percutaneous catheter-assisted drainage with fluoroscopic guidance. Drainage of abdominal abscesses was performed to 126 patients, who had been operated for gastric, hepatic or pancreatic tumors and developed abdominal abscesses postoperatively.

Indication to therapy was an abdominal cyst as revealed by ultrasound or CT with possibility to perform safe percutaneous approach. Percutaneous drainage of abscesses is performed under fluoroscopic, ultrasound, CT guidance or with a combination of these methods. Comparative analysis of the results of percutaneous drainage under fluoroscopic guidance and conventional surgery performed for abdominal abscesses in oncological patients is

shown in the table below.

Complications after percutaneous drainage of abscesses were observed in 11.4% of patients. The complications most commonly

Treatment Results	Percutaneous drainage	Open surgery
Efficacy	96.9%	88.2%
Hospital stay	16.2 days	28.4 days
Mortality rate	3.1%	11.8%

occurred on the first stage during familiarization with the technique. We subsequently used our experience to develop methods for the prevention of possible complications, which have provided two-fold reduction of the rate of complications from 27.1% to 5.7%.

ANGIOGRAPHIC CRITERIA OF THE EFFECTIVENESS OF PREOPERATIVE REGIONAL CHEMOTHERAPY FOR OSTEOSARCOMA OF THE EXTREMITIES

B.I. Dolgushin, G.N. Machak, G.A. Kuchinsky, E.R. Virshke, M.D. Aliev (Moscow)

Introduction: neoadjuvant approach is standard for the treatment of localized osteosarcoma. The possibility of resistance to chemotherapy makes the efficacy assessment of preoperative chemotherapy an important factor. Among the numerous *in vivo* methods to assess the therapeutic effect, the evaluation of tumor vascularization and its changes during treatment is of particular importance.

Purpose of the study was to assess the correlation between angiographic changes during treatment on one hand, and local response and disease prognosis on the other.

Patients and methods: since 1986 we have assessed angiographic findings in 159 patients receiving regional intraarterial chemotherapy with anthracyclines or cisplatin. Complete angiographic response was defined as the absence of pathological vascularization, no opacification during capillary phase and normalization of the diameter of efferent arteries. Necrosis of over 90% of the tumor bulk was defined as marked histological response.

Results: in patients with no or partial reduction of tumor vascularity there were 24 cases of marked histological response out of 87 patients operated on (28%), whereas in patients with complete reduction of tumor vascularity there were 16 cases of marked histological response out of 16 patients operated on (100%), p=0.00001. Among 81 patients with unchanged or slightly decreased opacification during capillary phase there were 21 cases (26%) of marked histological response, whereas in patients with complete reduction of capillary phase opacification there were 18 cases out of 19 (95%), p=0.00001. In patients with complete normalization of the diameter of efferent arteries there were 21 cases of marked histological response(91%), whereas vs 23% in the other group, which included 79 patients, p=0.0001. The 5-year survival rate correlated with the decrease of pathological vascularization of the tumor (p=0.004), its opacification (p=0.001) and normalization of the diameter of efferent arteries (p=0.001).

Conclusion: angiographic changes in tumor during preoperative intraarterial chemotherapy significantly correlate with histological response and disease prognosis. Angiographic criteria can be used to assess the effect of osteosarcoma treatment.

EVOLUTION OF THE COMPLICATIONS OF PERCUTANEOUS ENDOBILIARY INTERVENTIONS IN ONCOLOGICAL PATIENTS WITH MECHANICAL JAUNDICE

B.I. Dolgushin, A.V. Kukushkin (Moscow)

Purpose of the study: to determine the incidence of complications at various time points of postoperative period after percutaneous transhepatic endobiliary interventions (PTEI) in oncological patients with mechanical jaundice.

Materials and methods: we assessed complications occurring after catheter drainage (external or internal) and stenting of bile ducts in 500 patients.

Results: complications after PTEI were observed in 52.8% of patients, 20.9% of these were severe. Within 30 days postoperatively complications were observed in 39.8% of patients, 17% of these were severe. Between days 1 and 14 postoperatively there were 31.1% of patients with complications, 13.6% of these were severe. At days 2-7 of hospital stay the highest rate of complications was detected (12.8%). The ratio between severe and mild complications was 4% and 8.8%, respectively. At 2 weeks the proportion of mild complications decreased to 9.2%, however, the per cent of severe complications increase to 4.6%. Maximum amount of obturative or infectious events is observed at days 2-7. The highest rate of hemorrhagic complications was detected 1 day after the intervention. Beginning from day 14 we observed decrease of the rate of complications and changes in their qualitative composition (lower rate of severe complications and higher rate of mild complications). At day 30 the rate of obturative and infectious complications increased again. Mortality rate was 8% (4% at week 1 vs 2% at week 2). The nature of complications and the associated mortality rate has substantially changed over the last 10 years. Thus, between 1981 and 1991 severe complications were observed in 26.3% of patients with total mortality rate of 33.2%, mortality rate due to complications was 21.2%; in contrast, between 1992 and 2002 these values were 19.8%, 14% and 4.9%, respectively.

Conclusion: the most dangerous period as regards to complications and associated mortality is the first 14 days postoperatively. A total of 65.4% of severe complications and 75% of deaths occur within this time interval.

TRANSHEPATIC ENDOBILIARY OPERATIONS FOR MALIGNANT STRICTURES OF THE BILE-DUCTS

S.A. Kapranov, V.F. Kuznetzova (Moscow)

Between 1984 and 2004 we performed transhepatic endobiliary interventions to 304 patients with malignant strictures of bile ducts causing mechanical jaundice in order to restore bile outflow into the intestine.

Transhepatic endografting of hepatic and common bile ducts was performed in 275 (90.5%) cases and in 29 (9,5%) cases magnetic biliodigestive anastomoses were performed. The restriction of the bile ducts was caused by malignant neoplasms: of the pancreas in 191 (62,9%) patients, of common bile duct - in 35 (11.5%) cases, of gallbladder - in 15 (4.9%) cases, of major duodenal papilla - in 21 (6.9%) cases, as well as primary tumor or metastasis to the liver hilus in 42 (13.8%) cases.

Low strictures were observed in 213 (70.1%) patients while 91 (29.9%) patients had high strictures.

A total of 294 endobiliary stents were implanted to 275 patients: 163 synthetic stents (in 9 cases 2 stents were implanted); 12 Kary-Kuns stents; 2 metallic spiral stents; Rybkin nitinole spiral stents (2 stents in one patient); 40 self-expanding braided Wallstents (2 stents in 7 patients); 64 knitted self-expanding nitinole Alex stents (2 patients with 2 stents); 1 matrix expanding stent on the base of the steel Palmaz stent.

Of 29 magnetic biliodigestive anastomoses there were 26 choledochoduodenoanastomoses and 3 hepaticoduodenoanastomoses.

Transhepatic endografting of the bile ducts and magnetic bioliodigestive anastomoses were technically successful in all cases.

Complications of final endobiliary interventions were observed in 4 (1.5%) patients. These included hemobilia in 3 and duodenal wall perforation in 1 patient.

Long-term follow-up between 1 and 48 months (mean 11.4±0.2 months) demonstrated recurrent mechanical jaundice in 24 (9.1%) patients.

Mean survival in patients after final endobiliary interventions was 1-48 months (mean 8.3±0.1 months).

In conclusion, transhepatic endobiliary interventions for malignant strictures of bile duscts, including endografting and magnetic biliodigestive anastomoses, are minimally invasive and highly effective for the treatment of mechanical jaundice.

DRAINING OF THE PERICARDIUM - EMERGENCY INTERVENTIONAL RADIOLOGICAL TECHNIQUE FOR CLINICALLY SUGNIFICANT HYDROPERICARDIUM IN CANCER PATIENTS

B.I. Dolgushin, E.R. Virshke, V.Yu. Kossyrev, B.T. Tissen (Moscow)

Since 1999 pericardium puncture and draining have been performed in 36 patients, among them 23 women. The age of patients was 17 to 78 years.

Nine (9) patients had lymphogranulomatosis, 7 patients had breast cancer, 7 patients had lung cancer, 4 patients had lymphoma, 3 patients had esophageal or gastric carcinoma, 3 patients

had uterine or ovarian carcinoma; chondrosarcoma of the clavicle, bladder carcinoma and thyroid gland cancer were observed in single instances. Almost half of patients (48.6%) underwent draining of the pericardium. In two patients repeated puncture was undertaken. In all patients the procedure was performed under local anesthesia using standard approach (0.5 cm to the left of the xiphisternum) and 21 G needle, 7.5 cm in legth. Draining was performed according to Seldinger's technique using 8 F catheter.

Puncture and draining of the pericardium were conducted at the interventional radiology unit under ultrasound and fluoroscopic guidance. ECG monitoring was mandatory.

All 36 patients had serous-hemorrhagic discharge. The volume of a single aspirate was 600 to 1500 ml.

In two patients the procedure was complicated by accidental puncture of the myocardium causing ST elevation. No specific care was needed in either case.

Therefore, puncture and/or draining of the pericardium in oncological patients with clinically significant volume of exudation is today sufficiently safe and rather effective method of treatment and diagnosis.

PUNCTIONAL DRAINING - AN EFFECTIVE INTERVENTIONAL METHOD OF TREATMENT OF SURGICAL COMPLICATIONS IN CANCER PATIENTS AFTER THORACIC SURGERY

B.I. Dolgushin, O.A. Pankratenko, E.R. Virshke,
V.A. Cherkassov (Moscow)

Purpose of the study was to improve immediate results of surgery in patients with postoperative "surgical" interventions using minimally invasive methods of interventional radiology (IR).

Materials and methods: we analyzed the results of treatment in 101 patients with postoperative suppuration, which required IR procedurs: sanation puncture was performed in 27.7% of cases, puncture draining was performed in 72.3% of cases. There were no contraindications to any of the interventions performed. IR procedures were conducted under local anesthesia. Draining of pleural cavity was performed in 33.7% of patients, abdominal cavity - in 66.3% of patients, both in 1% of patients. Diagnosis and the choice of puncture direction were determined under ultrasound and/or CT control, fluoroscopic guidance was conducted during draining. Values characterizing the efficacy of draining were the degree of fever, blood count, changes of cavity volume. Normalization of clinical and laboratory values was observed within the first 3 days (or by the end of day 1 in 78% of patients). Fistulography was conducted 2-3 days postoperatively and every 4-6 days thereafter. The drainage was removed if there were no clinical or laboratory signs of an abscess, fistulography revealed no pathological cavity and the daily volume of discharge was below 5 ml of clear fluid. Positive outcome was achieved in 89% of patients. In 7% of patients conventional surgery was necessitated. Mortality rate was 7%. Complications due to IR procedure were found in 4% of cases. The duration of drainage if cases of hematoma or uncomplicated abscess was ? 16 days. Draining of an abscess with leakage or fistula was continued for 12 weeks. IR technology decreased the hospital stay by 6 days on average.

Discussion: Minimally invasive IR procedures can be considered a method of choice for the treatment of postoperative suppurative complications in oncological patients after thoracic surgery.

«Interventional Neuroradiology»

PARTICULARITIES OF THE USE OF THE FLOW-DIRECTED CATHETER AND MICRO-CATHETER ON MICRO-GUIDE IN THE TREATMENT OF CEREBRAL ARTERIO-VENOUS MALFORMATIONS (AVM)

A.L. Rogozin, A.V. Skupchenko, Yu.V. Suslin, A.N.Androssov (Samara)

Between January 2004 and September 2004 a total of 23 endovascular procedures were performed to 17 patients for brain AVM. Catheterization of AVM afferent vessel was conducted with a micro-catheter (Rapid Transit, Cordis) on micro-guide (Radiofocus 0.012, Cook), and a flow-directed catheter (Magic 1.5-1.8; Balt, Montmorency, France). Embolization was performed via transfemoral approach according to standard procedure under general anesthesia. This study compared the time of fluoroscopy during the interventions with micro-catheter on micro-guide vs flow-directed micro-catheter. This parameter was used as an indirect criterion of technical difficulty. Time of fluoroscopy was assessed during each procedure (one afferent vessel per procedure). Mean fluoroscopy time for micro-catheter on micro-guide interventions was 15.6 ± 5.2 min vs 22.7 ± 4 min for flow-directed catheter interventions. T-test value for the comparison of fluoroscopy time between groups was 5.5, which is statistically significant. Therefore, catheterization of afferent vessels during embolization of brain AVM with micro-catheter on micro-guide reduces the procedure time, which is particularly important during repeated interventions. This technique provides a wider choice of embolization material, thus substantially facilitating the achievement of procedure goals.

ENDOVASCULAR INTERVENTIONS FOR ARTERIAL ANEURYSMS AND ARTERIO-VENOUS MALFORMATIONS OF THE BRAIN

V.Yu. Bondar, G.E. Chmutin, V.A. Razumovsky, M.V. Shevchuk (Khabarovsk)

Between October 2002 and October 2004 a total of 21 cerebral angiography procedures were performed in patients presenting with symptoms of hemorrhagic cerebrovascular accident (subarachnoid, subarachnoid-parenchymatous, subarachnoid-parenchymatous-ventricular hemorrhage), including 6 emergency procedures performed for acute stage of hemorrhage. Arteriovenous malformations (AVM) were found in 7 patients, arterial aneurysms (AA) - in another 7 patients. One patient had low-flow carotid-cavernous fistula, segmented hypoplasia of anterior cerebral artery was found in another patient.

Endovascular occlusion was performed in 6 patients, including 2 AA and 4 AVM.

Mean age of patients was 36 years, there were 4 men. AA location was as follows: lower bifurcation of basilar artery - 1, cavernous portion of internal carotid artery - 1. AVMs were located in the left parietal lobe in 2 patients and in the occipital lobe in another 2 patients. AA occlusion was performed with guided detachable microcoils, AVM occlusion - with glue composition N-butyl-2-cyanocrylat (Histoacryl)-lipiodol. In this case WADA test was performed immediately before occlusion to assess the severity of neurological disorders.

Both patients with AA had successful angiographic result, in patients with AVM complete occlusion was achieved in 1 case, partial occlusion was performed in 2 patients, and in 1 patient AVM occlusion was rejected due to poor results of WADA test (disabling stroke).

This experience suggests, that endovascular occlusion is a promising method for the treatment of cerebral AA and AVM, being a combination of efficacy and minimum invasiveness.

EMBOLIZATION OF CEREBRAL ARTERIAL ANEURYSMS WITH DETACHABLE COOK MICRO-COILS

A.V. Skupchenko, A.L. Rogozin, Yu.V. Suslin, A.N.Androssov (Samara)

A total of 15 procedures of cerebral arterial aneurysm embolization with Cook mechanic detachable microcoils were performed in 14 patients since March 2004. Three types of detachable microcoils were used for embolization: Standart (0.015 inch), Soft (0.014 inch), Super Soft (0.011 inch). Aneurysm catheterization was performed with micro-catheters (Micro Ferret-18, Surf-11 (Cook), Rapid Transit 18 (Cordis)) and micro-guides (Radiofocus 0.012, 0.018 (Terumo)). A total of 37 microcoils were implanted.

Total occlusion of aneurysm was achieved in 4(27%) cases, subtotal - in 9(60%), partial - in 3 (23%). Postoperative increase of neurological deficit was observed in 2 patients (14%). The cause of complications was embolization of MCA cortical branches in one case and ICA thrombosis in the other. Follow-up angiography performed in a single patient 3 months following embolization confirmed total occlusion of aneurysm. Deformation and over-dilation of Standart 4x120 mm coils and Super Soft 4x100 mm was found in three cases during reimplantation. This required removal of the micro-catheter with microcoil followed by repeated catheterization of aneurysm. In the last case an attempt to remove the microcoil with micro-catheter resulted in spontaneous detachment of microcoil into internal carotid artery (ICA) causing its thrombosis. The cause of microcoil damage was thought to be the inadequate choice of length and diameter, thus leading to the application of excessive axial force to the microcoil during its implantation. In conclusion, the preliminary results suggest, that the micro-catheters and microcoils can be effective for embolization of cerebral arterial aneurysms.

RESULTS OF ENDOVASCULAR TREATMENT OF NASAL BLEEDINGS OF DIFFERENT ETIOLOGY

V.E. Riabukhin, G.E. Belozerov, A.B. Klimov (Moscow)

For the last years endovascular occlusion has been used increasingly common to treat nasal bleedings. Endovascular embolization of the bleeding source was performed in 60 patients with nasal bleeding of various origin. The causes of nasal bleedings were: injury in 35 patients, Rendu-Osler disease in 15 patients, maxillofacial tumor in 5 patients, hypertension in 4 patients, unknown cause in 1 patient. Angiography showed the bleeding source to be a.maxillaris (78.1%), a.facialis (4.68%), a.ethmoidalis (4.68%), ICA false aneurysm (3.12%); unknown source was shown in 9.4% of cases. All patients underwent successful distal-proximal embolization. Embolization material (Truffil, Tungsten, Bismut) was used for distal embolization and micro-coils - for proximal embolization. The method of distal-proximal embolization for recurrent profuse nasal bleedings is effective and minimally invasive, therefore, it can be recommended among the basic treatments for this condition.

ENDOVASCULAR OCCLUSION OF ARTERIAL ANEURYSMS OF BRAIN VESSELS

A.B. Klimov G.E. Belozerov, V.E. Riabukhin (Moscow)

Purpose of the study was to develop a method of endovascular embolization of cerebral arterial aneurysms. A total of 50 patients were operated on (31 women, mean age 45 years). Of these 50 patients 48 underwent embolization of aneurysm cavity with detachable microcoils, implantation of a stent-graft was performed in 2 patients. Arterial aneurysms were located in vertebrobasillar territory (24), ICA territory (23), MCA (2), ACA (1). Complications of endovascular therapy were observed in 6 patients: intraoperative aneurysm rupture in 3 patients, distal migration of microcoil in 2 patients, peripheral embolism with thrombi from aneurysm cavity. Endovascular embolization of cerebral arterial aneurysms is an effective and, in some instances, the only possible method.

ENDOVASCULAR SURGERY FOR ATHEROSCLEROTIC LESIONS OF THE SUBCLAVIAN ARTERIES

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P. Dundua, A.M. Babunashvili (Moscow)

Purpose: the evaluate the possibilities and the results of percutaneous transluminal angioplasty (PTA) of the subclavian arteries.

Methods: we have treated 27 patients with the lesions of subclavian arteries. Among them 11 patients had stenotic lesions (with the stenosis degree from 70 to 95%), 16 patients had occlusions of

the proximal segment of the subclavian artery. Twenty two patients had marked clinical signs of the disease (neurological symptoms in 9, hemodynamic disturbances in 19, upper limb's weakness - 3). In 5 cases the lesions of the subclavian arteries were revealed during the angiographic examination of the aortic arch branches.

Before PTA all the patients underwent ultrasound Dopplerography and angiography, pressure gradient was measured.

Six patients underwent PTA and, taking into the account its satisfactory result, the stenting wasn't applied. Stenting was carried out in 20 patients (a total of 21 stents were implanted). In most cases the implantation of 1 stent led to the relief of residual hemodynamic disturbances. In 1 patient we had to implant 2 stents due to the length of the lesion.

Results: positive immediate results were noticed in all patients. Only in one case we could not achieve the recanalization of chronic subclavian occlusion; taking into the account the signs of subclavian steal syndrome in this patient we performed PTA of internal carotid artery' stenoses. Mean duration of hospital stay was 2 days. No serious complications were noticed in the studied group. Long-term follow-up was achieved in 17 cases (from 1 to 5 years). Control ultrasound Dopplerography and angiography didn't reveal occlusions or reocclusions of the restored segments. In 5 cases initial signs of restenosis were revealed, but they didn't have any impact on hemodynamics and didn't necessitate repeated intervention. Clinical improvement was noticed in all patients.

Conclusion: percutaneous transluminal angioplasty (PTA) for subclavian occlusions and stenosis gives satisfactory early and late results in most patients, allows to avoid more traumatic open surgery and improves the patients' quality of life.

ENDOVASCULAR TREATMENT OF BRACHIOCEPHALIC ARTERIES IN PATIENTS WITH ATHEROSCLEROSIS

V.N. Perepelitzyn, O.G. Karakulov (Perm)

We have performed 110 procedures of brachiocephalic arteries PTA in 103 patients with multifocal atherosclerosis (aged 42 to 78 years) between 1992 and 2004. Lesion were located in brachiocephalic trunk in 6 cases, common carotid arteries - in 5 cases, internal carotid artery - in 1 case, vertebral artery - in 6 cases, subclavian artery - in 92 cases. Simultaneous PTA of brachiocephalic arteries, renal arteries and/or arteries of the lower limbs was performed in 12 patients, 23 patients underwent PTA of another vascular territory during the follow-up period. Six patients with brachiocephalic arteries underwent PTA of common carotid and vertebral arteries (2 patients), common carotid and subclavian arteries (2 patients), subclavian and vertebral arteries (1 patient), brachiocephalic trunk and subclavian artery (1 patient). Single-stage intervention was performed in 2 patients, PTA of the next artery was performed in 4 patients 5, 6, 11 days and 2 years postoperatively. One patient underwent repeated PTA of brachiocephalic trunk 3 years postoperatively. No effect was observed in one patient with occlusion and 2 patients with stenosis of subclavian artery. Decrease or reduction of chronic brain hypoperfusion was achieved in 97 patients (94.2%). One patient had transitory ischemic attack following surgery (0.9%), another one presented with progressive circulatory encephalopathy (0.9%), thrombosis of the approach artery (1) and the dilated artery (1), lethal brain stem stroke in one patient (0.9%).

In conclusion, PTA has proved highly effective for the treatment of brachiocephalic arteries lesions in atherosclerotic patients. The rate of complications is comparable between PTA and conventional surgery.

ENDOVASCULAR SURGERY OF ARTERIO-VENOUS MALFORMATIONS OF THE BRAIN: YESTERDAY AND TODAY

A.E. Vassiliev, S.V. Yakoniuk, M.V.Vlassov, A.A. Dadykin (Vladimir)

Purpose: to define the place for endovascular technologies in the range of surgical options in patients with brain arteriovenous malformations (AVM) considering the dynamics of its development and the efficacy of its use.

Materials and methods: Between 1995 and 2004 we assessed 19 patients (among them 12 men) with brain AVM (the age of patients ranged from 16 to 51 years, mean age was 27.5±9.9), who subsequently underwent endovascular therapy. Most common clinical forms of AVM were: apoplectic form (intracranial hemorrhage) in 9 patients (47.4%), epileptiform seizures in 7 patients (36.8%), and migraine-like form in 3 patients (15.8%). All patients underwent instrumental assessment, which included neurophysiological testing (electro-encephalography (EEG), echoencephalography, rheoencephalography, transcranial Doppler sonography plus duplex ultrasound study of the neck arteries), computer tomography (CT) and, after 2002, brain magnetic resonance imaging. Total brain angiography was mandatory in all patients to clarify the structure of AVM, its location and its predominant vascular bed. All AVMs were of plexiform and fistula types. Racemose form was encountered in 11 patients (57.9%), spongy-form type - in 8 cases (42.1%). AVM location was supratentorial in 16 cases (right hemispheral location in 7 cases (36.8%), left hemispheral - in 9 patients (47.4%)); subtentorial location (AVM of cerebellar hemisphere) was seen in 2 cases (10.5%) and suprasubtentorial - in 1 case (5.3%). As a rule, there were more than 2 feeding vessels (afferents to the AVM), which belonged, in the majority, to different vascular territories.

Results: Our views on endovascular tactics for AVM treatment have evolved over time. Use of detachable balloon catheter, which proved effective for cavernous-carotid fistula, fluoroplastic balls of various diameter and metal coils for AVM embolization using uncontrollable distal occlusion of the stroma have, unfortunately, resulted in recurrent AVM at different time points in all 7 patients. The introduction of polymerizing histacryl composition has made the efficacy highest in these patients. In 11 cases we achieved angiographic and clinical success, there were two episodes of transient neurological disorders (in one patient in the peracute stage of intracranial treatment within 1 month). One patient with subtentorial AVM in the peracute-stage of intracranial hemorrhage died 5 days after successful occlusion of the stroma and the afferent arteries from progressive edema of brain stem structures, which made us ponder on the possibility to use this method during the acute stage of hemorrhage.

In **conclusion**, directed roentgenoendovascular occlusion of the stroma and of the afferent arteries of AVM with polymerizing composition is most effective and, frequently, an isolated method for the treatment of complex neurosurgical pathology (AVM).

ANGIOPLASTY AND STENTING OF THE INTERNAL CAROTID ARTERY IN THE SETTINGS OF BRAIN PROTECTION

S.V. Volkov, V.A. Ivanov, V.A. Lazarev, G.I. Antonov, E.R. Miklashevich (Krasnogorsk, Moscow)

Materials and methods: Since 2003 we have performed 76 carotid stenting procedures with brain protection in 73 patients. Mean age of patients was 67.5 years, 43.1% of these had a history of stroke or transitory ischemic attacks (TIA).

Two patients underwent single-stage bilateral stenting of the internal carotid arteries. In the majority of cases, we used SMART and PRECISE self-expanding nitinole stents. AngioGuard cerebral filters were used for antiembolic protection. Permanent control with transcranial Doppler study was performed intraoperatively. Implantation of stent into the carotid artery, in the majority of cases, was associated with microembolism as suggested by transcranial Doppler study. Macroscopic particles were found in 74.8% of the filters removed.

There were 3 complications: 1 stroke, 1 transitory ischemic attack (TIA) (after surgery), 1 partial rupture of the internal carotid artery (ICA). Long-term in-stent restenosis was found in 3 cases.

Conclusions: Endovascular interventions are minimally traumatic and effective for the treatment of carotid stenosis and can be an alternative to open surgery in 70-80% of cases.

Angioplasty and stenting of carotid arteries must be performed only with antiembolic brain protection.

Minimal duration of the manipulation at the site of stenosis and adherence to the standard procedure are the best way to prevent complications.

ENDOVASCULAR EMBOLIZATION OF CEREBROVASCULAR ANEURYSMS AND ARTERIOVENOUS MALFORMATIONS

S.V. Volkov, V.A. Lazarev, V.A. Ivanov, G.I. Antonov, E.R. Miklashevich (Krasnogorsk)

Since 1995 we have performed 42 embolizations of arterial aneurysms and 53 embolizations of arterio-venous malformations (AVM). Mean age of patients was 46 years.

A history of 1 to 3 episodes of subarachnoid hemorrhage prior to the intervention was revealed in 40 patients.

Assessment of size and location of an aneurysm or of AVM was of great importance for the determination of indications for endovas-

cular embolization. In case of aneurysm the main values included aneurysm neck diameter and angle, as well as the changes in afferent vessel. In case of AVM we assessed its location and position, sources of blood supply and blood outflow, baseline cerebral circulation.

Platinum micro-coils were used for aneurysm embolization, and glue compositions - for AVM embolization. The number of micro-coils implanted varied with the size or aneurysm and was determined individually during the intervention. The volume of glue composition depended on the number of AVM afferent vessels and on the size of stroma.

Embolization of aneurysm was successful in 97.7% of cases, of these 75% developed complete occlusion. In one patient (2.3%) migration of a micro-coil to distal ACA portions occurred during embolization of an aneurysm involving the anterior cerebral artery and anterior communicating artery. One female patient died 3 days after embolization of the basilar artery aneurysm. Transverse sinus thrombosis was the cause of death.

Total embolization of AVM was achieved in 43% of cases.

Even the occlusion of a significant number of afferent arteries didn't result in complete embolization of AVM, as numerous collateral pathways occur after such intervention leading to the restoration of AVM blood supply. Complete recovery can be achieved in small AVMs. Therefore, 3 to 6 months postoperatively all patients underwent follow-up angiography. In 9 (20.5%) cases repeated staged embolization of new afferent vessels was performed for subtotal or partial occlusion of large AVMs involving several brain lobes. There were 2 cases with complications (3.7%). No deaths occurred.

On the base of our experience we can consider this method as effective and safe provided that the selection of patients and instruments is adequate. Embolization of aneurysms and AVM significantly reduces rehabilitation period. Another benefit of the method is the possibility to perform angiography and endovascular embolization immediately one after another.

«Restoration of Antegrade Blood Flow in Chronic Coronary Oclcusions: Technique, Early and Late Results»

RECANALIZATION OF CHRONICALLY OCCLUDED CORONARY ARTERIES AND GRAFTS

R. Simon (Kiel, Germany)

Abstract not submitted.

ENDOVASCULAR REVASCULARIZATION OF CHRONICALLY OCCLUDED CORONARY ARTERIES

D.G. Iosseliani, M.V. Yanitzkaya, P.Yu. Lopotovsky (Moscow)

Purpose of the study: the evaluation of the effectiveness of PTCA in patients with chronically occluded coronary arteries.

Material and methods: the study enrolled 292 patients who underwent successful mechanical recanalization and PTCA of chronically occluded coronary arteries from October 1997 to September 2004. 157 (53,8%) patients (Group 1) underwent PTCA with stenting, the remaining 135 (46,2%) patients (Group 2) - only PTCA.

There were no significant differences between the studied groups as for the essential clinical, laboratory and angiographic data. In Group 1 the procedure was carried out on the LAD in 84 (53,5%) cases, in the RCA - in 43 (27,4%), on the CxB - in 25 (15,9%), on other arteries - in 5 (3,3%) cases. In Group 2 the procedure was carried out on the LAD in 78 (57,8%) cases, on the RCA - в 28 (20,7%), on the CxB - in 20 (14,8%), on other arteries - in 9 (6,7%) cases. Endovascular procedures resulted in stabilization of the state and the relief of angina attacks in all patients. There were no in-hospital mortality, serious cardiac events, acute myocardial infarction (AMI).

Results: In the long-term follow-up (mean, 8,4 ±1,7 months) all patients underwent repeated in-hospital examination. There was no late mortality or repeated AMI.

In Group 1 satisfactory results of the procedures were preserved in 63,1% of cases, restenosis was revealed in 14,6%, reocclusion - in 22,3% of cases. In Group 2 satisfactory results of the procedures were preserved in 37,8% of patients, restenosis was revealed in 40,7%, reocclusion - in 21,5% of patients.

At control examination 43,6% and 53,3% of patients, respectively, were angina-free.

Conclusions: in long-term follow-up (about half a year after the procedure) the blood flow restored with endovascular methods persisted in about two thirds of patients. When PTCA is combined with stenting for the restoration of blood flow, the vessel's lumen at the site of procedure is not subject to significant changes (restenosis and reocclusion) reliably more often than with PTCA alone. The preservation of antegrade blood flow in those vessels the anginal attacks are significantly reduced or totally disappear.

RECANALIZATION (ANGIOPLASTY AND STENTING) OF CHRONIC CORONARY OCCLUSIONS: TACTICS OF INTERVENTION, IMMEDIATE AND LATE RESULTS

A.M. Babunashvili, D.P.Dundua, D.S. Kartashov,
Z.A.Kavteladze (Moscow)

Objective: estimation of immediate and late results of recanalization in chronic coronary occlusions.

Material: angioplasty results were analyzed in 86 patients with occluded coronary arteries. Lumen of one occluded coronary artery was restored in 83 patients, lumens of 2 occluded coronary arteries - in 3 patients. A total of 89 occluded coronary artery segments underwent surgical intervention: 54 - in left anterior descending coronary artery (LAD), 28 - in right coronary artery (RCA), 6 - in circumflex coronary artery (CA). In one case the lumen of occluded left main coronary artery was restored. The length of 46 occluded segments was 2 cm or less, the length of 43 segments - more than 2 cm. Eight segments were occluded from the ostium (all of them were located in the LAD); 52 occluded segments were located in the proximal portions of arteries, 17 - in the middle portions and 12 - in distal portions. Classic "wedge-shaped" occlusion stump was detected only in 48 cases (53.9%), distal post-occlusion arterial bed was clearly visualized through the collateral vessels of grade II and III in 60 cases (67.4%). Grade I collateral vessels were observed in 19 cases (21.3%), and in the 10 remaining cases (11.3%) it was difficult to assess distal arterial bed due to low collateral blood filling.

Results: procedure success (remaining stenosis less than 20%, blood flow TIMI III) was achieved in 71 segments (79.8%). Technical failure was observed in 13 cases (14.6%), and in 5 patients (5.6%) complications developed (2 artery perforations resulted in hemopericardium, though there was no need for pericardiocentesis or surgical intervention; 2 acute thromboses of recanalized segment without clinical and ECG-manifestations, and 1 non-Q-wave acute myocardial infarction).

There were no fatal outcomes. Stenting was performed in 42 out of 71 recanalized segments (59.2%), and in 29 segments (40.8%) only balloon dilatation was conducted. A total of 68 stents were implanted in 42 segments (on the average 1.6 stents for 1 occluded segment). In 10 out of 13 cases of technical failure "bridge collaterals" were observed, in 11 cases there was no well-defined "wedge-shaped" stump, in 12 cases the occlusion duration was more than 1 year, and the length of occlusion was more than 2 cm in 10 segments. In both cases of arterial perforation the occlusion duration was more than 2 years.

Late results were evaluated in 41 (63.1%) out of 65 patients with successful immediate results of surgical intervention. Annual survival was 98.5%. Control coronary angiography was performed in 31 patients. Angiographic restenosis was observed in 10 cases (32.2%), 21 patients had no evidence of restenosis (67.8%). Clinical symptoms of angina recurrence were observed in 8 (19.5%), out of 41 patients, it was 1.6 fold less than angiographic restenosis rate.

Repeated myocardial revascularization (repeated angioplasty in all cases) was performed in 5 patients (12.2%). Stenting was performed in 20 (83.3%) out of 24 segments without angiographic restenosis, and in 5 out of 10 segments with restenosis.

Summary: In case the occluded coronary artery supplies the biggest part of viable myocardium (myocardium with intact contractility or "hibernating" myocardium), recanalization and angioplasty of the occluded segments with occlusion duration of one year or less, is considered to be clinically effective procedure regarding both immediate and late results.

Stenting of recanalized segments improves late results of intervention. Comparative analysis of PTCA and stenting results allows us to make a conclusion that stenting is an obligatory procedure after recanalization and angioplasty of the occluded artery.

CLINICAL EFFECTIVENESS OF MYOCARDIAL REVASCULARIZATION IN CHRONIC CORONARY OCCLUSIONS

A.V.Protopopov, T.A. Kochkina, E.P.Konstantinov,
D.P. Stoliarov, Ya. O. Fedchenko, P.G. Gavrikov (Krasnoyarsk)

Objective: evaluation of dynamics of clinical parameters in patients with chronic coronary occlusions after catheter interventions.

Materials and methods: clinical results were evaluated in 225 patients with successfully performed recanalization of chronic coronary occlusions at follow-up of 36 months after the procedure. Recanalization of left anterior descending artery was performed in 105 patients, right coronary artery - in 90 patients, left circumflex coronary artery - in 30 patients. Occlusion duration was 3-48 months. Stenting of occluded segment was performed in 85% of cases.

Results: recanalizations of chronic occlusions, especially interventions on the left anterior descending artery and right coronary artery, were associated with positive clinical effect. Functional class of angina reduced from III to 0-I, LVEF increased by 8-20%, and exercise tolerance increased on the evidence of exercise tests results. After the follow-up period of 36 months restenosis of operated segment was observed in 18% of cases in patients with recanalization of left anterior descending artery, in 15.5% of recanalizations of right coronary artery, and in 20% of recanalizations of left circumflex coronary artery (metallic stents were used).

Conclusion: myocardial revascularization in chronic coronary occlusions is an effective method of therapy in patients with coronary artery disease and is associated with improvement of basic clinical parameters.

IMMEDIATE RESULTS OF ENDOVASCULAR TREATMENT OF CHRONIC CORONARY OCCLUSIONS

A.P. Perevalov, O.S. Poletaev, K.B. Klestov (Ijevsk)

Since January 2000, 29 recanalization procedures on chronic coronary occlusions were performed in 27 patients aged from 40 to 79 years. Eleven patients had right coronary artery occlusion, 2 - left main coronary artery occlusion, 9 - occlusion of left anterior descending artery, 3 - of obtuse marginal artery, 4 - of left circumflex coronary artery and 1 - of posterior descending coronary artery. We managed to restore the patency of 21 arteries (immediate success in 72.41% of cases). Stenting of these arterial segments was performed in 12 out of 21 cases (in one case 2 stents were implanted), percutaneous transluminal coronary angioplasty alone with satisfactory angiographic result was performed in 9 cases. At the beginning of procedure guidewires "STABILIZER", "SOFT", and "SUPERSOFT" were used in all cases; and then guidewire "SCHINOBI" was used. The characteristics of recanalization in chronic occlusions are long duration of surgical procedure and fluoroscopy, large consumption of contrast agent that certainly leads to limited usage of this procedure in debilitated patients and patients with critical status.

Recanalization attempts were stopped after 90 minutes of X-ray exposure, contrast agent consumption up to 400 ml ("Omnipak-350","Nicomed").

Conclusion: our experience in endovascular recanalization of chronic coronary occlusions shows that this method can be used in clinical practice. The most important criteria of patient selection for coronary artery recanalization are occlusion duration (up to 3 months), presence of impaired vessel stump, presence of lateral branch at the occlusion region.

FOLLOW-UP OF STENTING FOR CORONARY OCCLUSIONS

S.A. Biriukov, A.M. Babunashvili, P.G. Shwalb, V.V. Kazakov, G.N. Lazareva (Riazan)

Purpose: to assess the long-term efficacy of stenting for recanalization of coronary artery occlusion.

Materials and methods: we analyzed the results of successful recanalization performed for chronic occlusion of coronary arteries in 68 patients (76 segments) between 1996 and 2004. Mean age of patients was 49±9 years. All patients had FC II-III angina. In 18 patients occlusion was accompanied by stenoses of other large coronary arteries and was analyzed isolated lesion only in 8 patients. The ejection fraction (EF) was above 50% in 54 patients (79.4%), between 40 and 50% - in 14 patients (20.6%). Mean duration of occlusion was 7±4 months.

Long-term results were assessed in 64 (94.1%) patients, of these 48 patients (75%) underwent repeated coronary angiography, the remaining 16 patients (25%) were examined using questionnaire and stress testing. Mean long-term follow-up after coronary stenting was 11.4 months. Maximum follow-up was 63 months.

Results: in 90.8% of patients after balloon dilatation at the site of coronary artery recanalization we found intimal dissection and residual stenosis over 50% (in a total of 69 occlusions out of 76). Only in 7 patients (9.2%) there were minor angiographic findings after balloon dilatation (no dissection, and residual stenosis below 50%). Complications of dissection, which doubtlessly required stenting, were found in 27.4% of cases, in 2.6% of cases balloon dilation was followed by acute occlusion at the site of recanalization.

Angiographic restenosis was observed in 11 (22.9%) cases out of 48, reocclusion was revealed in one segment (2.1%). The highest rate of restenosis in the middle LAD portion was 39.3%. Restenosis was twice more common in arteries ≤3 mm in diameter compared to arteries above 3 mm in diameter.

In the long-term period the left ventricular EF increased from 4 to 16%. In 46 patients (67.6%) no further symptoms of angina occurred. FC I angina was detected in 4 (5.9%) patients, FC II angina - in 6 (8.8%), and FC III angina - in 8 (12.5%) respectively.

Conclusions: stenting improves the results of balloon angioplasty after recanalization of coronary arteries. Independent predictors of long-term success after recanalization and stenting for coronary artery occlusion are: arterial diameter and the length of occlusion at the site of stenting.

ANATOMICAL AND MORPHOLOGICAL ANALYSIS OF THE CASES OF CORONARY ARTERY PERFORATION OCCURRED DURING RECANALIZATION

V.I. Ganiukov, A.A. Shilov, N.I. Sussoev, I.N. Shigantzov, M.V. Demina, I.Yu. Bravve (Novosibirsk)

Objective: analysis of anatomo-morphological features of coronary occlusions that are potentially dangerous due to a risk of artery perforation during percutaneous recanalization.

Materials and methods: percutaneous coronary intervention (PCI) due to coronary occlusions was performed on 139 occluded segments in 137 patients. One hundred and sixty four attempts of guidewire recanalization were conducted. Coronary occlusion were located in the left anterior descending artery, right coronary artery and circumflex artery. Most frequently interventions were performed in the left anterior descending artery region - 76 cases (54.7%). Forty six PCI (33.1%) were performed on RCA occlusions. Recanalization of circumflex artery was performed in 17 (12.2%) cases. The rate of perforation development was analyzed considering various morphologic features of occlusion: length of occluded segment,"age" of occlusion, location of lesion, bridging collaterals and antegrade blood flow.

Results: coronary artery perforation was observed in 9 cases that averaged to 5.5% of the number of guidewire recanalization attempts. All perforations were of grade I (slight amount of contrast outside the vessel) or II (large amount of contrast outside the vessel) and did not lead to cardiac tamponade. Eight occlusions were located in the right coronary artery. The occlusion duration was more than 3 months in 4 cases (45%). Anatomic features of occluded arteries, in which the perforation occurred, were as follows: in 8 out of 9 occluded segments (89%) the occlusion length was over 15 mm, bridging collaterals were observed in 4 cases (45%).

Conclusion: Risk of coronary artery perforation during recanalization is very high in the presence of following anatomo-morphological features: occlusion location in the right coronary artery in combination with length over 15 mm.

DYNAMICS OF GENERAL AND SEGMENTAL CONTRACTILITY OF LEFT VENTRICUALR MYOCARDIUM IN PATIENTS AFTER ENDOVASCULAR REPERFUSION OF CHRONICALLY OCCLUDED CORONARY ARTERY

P.Yu. Lopotovsky, S.P. Semitko, M.V. Yanitzkaya (Moscow)

Aims and purposes: to study the influence of endovascular restoration of the blood flow in chronically occluded coronary arteries on left ventricular function.

Material and methods: the study enrolled 115 patients who underwent successful mechanical recanalization of chronically occluded coronary artery with subsequent PTCA and stenting. In 62 cases the procedures was performed on the LAD, in 23 - on the CxB, in 30 - on the RCA. All patients were re-examined in 6,7±1,8 months.

Results: control coronary angiography revealed preserved antegrade blood flow in 93 (75,6%) patients, in 29 (23,6%) patients the vessel was re-occluded. In the whole studied group left ventricular ejection fraction (LVEF) increased from 56,29±1,35% to 59,76±1,34% ($p<0,02$). With this the greatest increase of LVEF was seen in the group of patients withour significant changes in the artery, submitted to endovascular procedure (from 58,70±1,14% to 61,89±1,80%; $p<0,02$). LVEF in patients with reocclusion of the target artery didn't significantly increase. The analysis of segmental contractility revealed that the increase of total LVEF occurs at the expense of segments that received blood supply from the coronary artery with preserved blood flow.

Conclusions: the restoration of the blood flow with PTCA in chronically occluded coronary arteries improves general and segmental function of the left ventricle in the long-term follow-up. This effect was seen only in cases of antegrade blood flow preservation by the moment of control examination in the long-term follow-up.

«Acute and Chronic Diseases of the Venous System: Tactics of Interventional Procedures, Early and Late Results»

TRENDS IN THE ENDOVASCULAR PROPHYLACTICS AND TREATMENT OF PULMONARY ARTERIAL THROMBOEMBOLISM (PATE)

V.I.Prokubovsky, S.A.Kapranov, V.P. Burov (Moscow)

A thirty-year experience of endovascular prophylactics of pulmonary arterial thromboembolism (PATE) showed that use of venous cava-filters (VCF), saving patient's life at the early stages of PATE, can be injurious to health at the long-term period because of late complications, i.e. thrombosis of the inferior vena cava (IVC), hollow organs perforation, migration and fragmentation of VCF and other.

Overcoming the disadvantages of permanent VCF implantation and improvement of endovascular prophylactics seems to be related to application: of removable VCF, in particular "Zontik" /Umbrella/ VCF and stent-filters produced in Russia; endovascular catheter thrombectomy (ECT) from IVC and iliac veins, and wider use of thrombolysis and low molecular weight heparins. It can also be related to optimization of VCF design and methods of VCF implantation and removal.

The design of removable VCF allows to correct filter position in case of incorrect implantation mistakes and to perform temporary implantation if necessary. It extends significantly capabilities of complex PATE prophylactics and decreases the possibility of complications. Furthermore, implantation of a filter-stent into the iliac vein minimizes the risk of IVC thrombosis.

Treatment with thrombolytics, ECT, anticoagulation therapy with low molecular weight heparins secured by temporary VCF implantation not only eliminates the PATE source, but it also restores the patency of thrombosed veins. Good effect of the treatment is a ground for VCF removal with positive results for the patient.

Optimization of VCF implantation technique and the VCF design is aimed at increasing efficacy of VCF and at providing conditions for a simple and atraumatic removal of the filter in all cases.

The method of choice for treatment of PATE is thrombolytic therapy. But the use of this method is significantly limited. It urged the development of endovascular instrumental methods to restore the patency of pulmonary artery. A number of parameters suggest that rotary desobstruction is preferable.

Studies performed at our clinic confirm that these trends are very promising for the development of endovascular prophylactics and treatment of PATE and for the treatment of acute venous thrombosis.

MODERN APPROACHES TO THROMBOLYTHIC THERAPY OF MASSIVE PULMONARY THROMBOEMBOLISM

A.I.Kirienko, V.I.Prokubovsky, S.G. Leontiev, V.P. Burov (Moscow)

Thrombolytic therapy is currently one of the basic methods of treatment of massive pulmonary arterial thromboembolism. Thrombolytic therapy was administered to 912 patients with pulmonary thromboembolism. Indications for the thrombolysis were based on the results of complex examination including echocardiography, US scanning of limbs' veins, pulmonary perfusion scanning, catheterization of the right cardiac chambers and angiopulmonography. According to angiopulmonography data, theromboemboli were located in the pulmonary trunk in 7.2% of cases, in both main pulmonary arteries - in 63.9% of cases, and in one of the main pulmonary arteries in 28.9% of cases. Activators of fibrinolysis (streptokinase, urokinase and tissue plasminogen activator) were injected most often into the systemic blood flow in the standard dosage. Selective injection was used in patients with total occlusion of one or several branches of the pulmonary artery. Repeated angiography showed complete blood flow restoration in the pulmonary arterial circulation in 15.2% of patients, partial restoration - in 71.6% and no improvement in 13.2% of patients. Rotary arterial desobstruction was performed in case of contraindications for thrombolytic therapy or in patients with critical extent of the embolism. Cubital approach for the angiographic intervention, use of this approach for systemic injection of fibrinolysis activators along with the surgical prophylactics of relapsing pulmonary embolism after thrombolysis allowed to decrease the rate of severe hemorrhagic complications by 60%. During the long-term period the patients were treated with indirect anticoagulants over at least 6 months with regular measurements of the international normalized ratio.

USE OF ENDOVASCULAR CATHETER THROMBECTOMY FROM THE INFERIOR VENA CAVA: THE ANALYSIS OF 98 CASES

V.P. Burov, V.I.Prokubovsky, S.A.Kapranov (Moscow)

Endovascular catheter thrombectomy (ECT) was performed in 98 patients aged 19 to 80 years old over the period from 1994 till September 2004. A floating thrombus in the inferior vena cava (IVC) was revealed by angiography or sonography in all patients: in 8 patients thrombus was located in the suprarenal part of the IVC, in 43 patients - in the intrarenal part of the IVC, in 43 patients - in the infrarenal part of the IVC. In 5 patients thrombus was located above the previously implanted vena cava filter. High location of the thrombus apex, which excluded the possibility of vena cava filter implantation in the standard position, was observed in 77 cases.

ECT was performed with thrombextractor "TREX" ("Comed" Ltd, Russia). Large thrombi (more than 5 cm in diameter) were extracted stepwise. Seventy-nine patients underwent implantation of vena cava filters (IVCF) of various models after the ECT procedure. Anticoagulation therapy was administered to all patients following ECT.

Thrombi were fully extracted ("full" ECT) in 77 (78.5%) patients: in 73 patients - from the IVC and in 4 patients - from the common iliac veins. Twenty one patients underwent "partial" thrombectomy that is removal of the floating apex alone. The extent of the intervention was reduced due to fixation of the thrombus's part to the ICV wall. Among the patients with "partial" thrombectomy there were 5 patients with a floating thrombus above the previously implanted vena cava filter.

Nineteen patients (24.7%) didn't require IVCF after "full" ECT as were was no threat of pulmonary arterial thrombembolism (PATE) after removal of the floating thrombus. In the other 58 patients (53.8%) the intervention was completed with vena cava filter implantation. In 25 patients IVCF was planned as temporary but only in 9 of them vena cava filters were removed. Permanent VCF were implanted following "partial" ECT in all patients. Two patients (2.04%) died during the early postoperative period; these fatal outcomes were not related to the endovascular intervention.

During the hospital stay and in the long-term period (2 to 87.5 months) occlusion of the infrarenal IVC part occurred in 14 (14.3%) patients. PATE developed in 4 (4.08%) patients. Eight patients died within 1.5 to 75.5 months after discharge from the hospital. The death was due to severe concomitant diseases.

Analysis of the results suggests high efficacy of ECT, as it helps to avoid the threat of PATE, to preserve IVC patency and allows implantation of vena cava filter if necessary.

MECHANICAL AND DRUG VASCULAR RECANALIZATION

V.A. Prolubschikov, N.V. Sokoliansky, V.V. Kucherov, D.K. Stepuro, A.V. Gaydukov, A.N.Abramov (Moscow)

Mechanical and drug recanalization of large pulmonary vessels in patients with thromboembolism promotes defragmentation and dissolution of thromboemboli. It also improves pulmonary perfusion and the function of right cardiac ventricle, decreases pulmonary arterial pressure and thus increases patients' survival rate.

Purpose of the study: to assess the effect of mechanical and drug desobstruction of pulmonary arteries and effect of combination of these methods on the course of acute period of pulmonary arterial thromboembolism (PATE).

Eighty patients with PATE aged 64.2±3.4 years old were treated at the department of intensive care and resuscitation of the cardiologic center of Burdenko Military Hospital from 1998 to 2003. Among the patients there were 67 males (83.8%). Assessment of the patients' clinical state and results of the instrumental examinations revealed massive lesion of the pulmonary vessels in 54%, sub-massive lesion - in 46% of patients. Of all the patients, 5.4% developed fulminant PATE, 18.6% developed acute PATE and 76% showed relapsing course of PATE. Mechanical and/or drug recanalization of pulmonary vessels was performed in all patients.

Pigtail catheter was used for endovascular rotary desobstruction, which was performed in 5 patients with massive PATE. A positive effect, i.e. fragmentation of the thrombemboli and their migration into the peripheral vessels, was achieved in 4 patients. Thereafter selective thrombolytic therapy with streptokinase was continued in 2 patients and the others were treated with heparin. Directly after the

intervention the Miller's index decreased on average from 28.2±2.5 down to 25.5±2.7 points ($p<0.05$). Systolic pressure in the pulmonary artery increased insignificantly from 50.9±13.08 up to 51.9±13.06 mm Hg. One patient died due to progressing cardiac and pulmonary insufficiency. Fibrinolytic therapy with the tissue plasminogen activator (TPA) was used in 26 patients, and with the streptokinase (SK)- in 49 patients. TPA agents were administered in bolus injections 15 mg, then 0.75 mg/kg during 30 minutes, then 0.5 mg during 60 minutes. The total dose amounted to 100 mg. Streptokinase was used in two dosage regimens: 250 000 units in bolus and thereafter 2 750 000 thousands units during 2-3 hours or 3 million units during 24-48 hours. Angiographic index decreased from 24.4±3.1 down to 20.2±3.2 within the first 2-3 days. Systolic pressure in the pulmonary artery increased from 46.7±6.2 up to 47.4±6.5 mm Hg at that period.

During the 7-10 day follow-up period complete restoration of the blood flow was observed in 15% of the patients and partial restoration - in 85% of the patients. Among the 54 patients with implanted vena cava filters 20.3% of the patients developed relapsing pulmonary embolism. Mortality rate in the short-term follow-up period amounted to 9.2% and in the long-term period - 2.0%. Among the patients without vena cava filters the rate of pulmonary embolism relapses was 30.7%, the short-term mortality rate was 26.9% and the long-term mortality rate was 3.8%.

Thus rotary desobstruction of the pulmonary vessels, fibrinolytic therapy and vena cava filter implantation in the inferior vena cava in patients with massive PATE allow to improve pulmonary perfusion and the function of the right heart ventricle, to decrease the rate of pulmonary embolism recurrence and in-hospital mortality rate.

CORRELATION BETWEEN THE TIME OF THROMBOLYTIC THERAPY FOR PULMONARY ARTERY EMBOLISM (PATE) AND THE SEVERITY OF HEMODYNAMIC DISTURBANCES

A.B. Protopopov, Ya.O. Fedchenko, T.A. Kochkina,
E.P.Konstantinov, D.P. Stoliarov, P.G. Gavrikov (Krasnoyarsk)

Purpose: to study long-term results, prognosis and clinical course of pulmonary arterial thromboembolism (PATE) depending on the admission time, severity of the pulmonary vascular damage and the use of endovascular interventions.

Materials and methods: over the period of 1993 - 2003 at the Krasnoyarsk regional clinical hospital 207 patients with confirmed PATE were treated. Echocardiography and pulmonary angiography were performed in all the patients. Ninety-seven patients without a history of pronounced chronic bronchial, pulmonary or cardiac diseases were selected from this group. Pulmonary angiography revealed massive bilateral thromboembolism of the pulmonary artery with high pulmonary arterial pressure in all the patients.

Results: at the time of admission to the hospital hypertension in the lesser circulation in PATE patients was directly dependant on the duration of the disease. The longer was the period before the start of thrombolytic therapy, the smaller was the pressure decrease in the pulmonary circulation after the treatment. At the long-term (after 12-72 months) period the systolic pulmonary arterial pressure ranged within the normal limits (27-30 mmHg) independently of the time of thrombolytic therapy in patients with a good compliance.

Conclusions: efficacy of thrombolytic therapy at the pre-hospital stage directly depends on the time of this therapy. During the long-term period (up to 6 years of follow-up) in the group of patients without significant bronchial, pulmonary or cardiac pathology, receiving recommended drug therapy, the pressure in the lesser circulation ranges within the normal limits and doesn't depend on the time of thrombolytic therapy.

POSSIBILITIES OF ENDOVASCULAR INTERVENTIONS IN THE TREATMENT OF PULMONARY BLEEDINGS

V.N. Perepelitzyn, O.G. Karakulov, A.S. Vladimirova (Perm)

Over the period of 1992 - 2004 we performed X-ray-guided endovascular occlusions of 184 bronchial and 13 intercostal arteries in 150 patients with bleedings of various etiologies. Among them there were 57 patients with chronic bronchitis, 31 patients with lung cancer, 24 patients with multiple bronchiectasis, 12 patients with pulmonary fibrosis, 9 patients with tuberculosis of the lungs, 5 patients with destructive pneumonia and polycystic lung disease and 2 patients with aspergillosis. The patients were 17 to 81 years old. Seventy patients had right-sided lesions, 73 patients had left-sided lesions, and 7 patients had bilateral lesions. Bronchial arteriography revealed the source of bleeding in 84% of cases. After endovascular intervention 29 patients (19.3%) developed recurrent pulmonary bleeding. Among them there were 2 patients (3.5%) with chronic bronchitis, 11 patients (35.5%) with lung cancer, 6 patients (25%) with multiple bronchiectasis, 3 patients (33.3%) with tuberculosis, 2 patients (16.6%) with pulmonary fibrosis, and 2 patients (100%) with aspergillosis. An efficient repeated occlusion of the bronchial artery was achieved in 2 patients with multiple bronchiectasis and in 1 patient with aspergillosis. Complications of endovascular occlusion of the bronchial arteries were registered in 8 cases (5.3%), these were 3 cases of spinal strokes (2%), 2 bronchial mucosal necrosis (1.3%), 3 cases of embolism and thrombosis of the arteries, from which the endovascular approach was performed (2%).

Thus X-ray-guided endovascular occlusion of bronchial and intercostal arteries is a safe method of hemostasis for pulmonary bleedings in patients with chronic bronchitis. It allows to stop bleeding and to prepare patients with multiple bronchiectasis, pulmonary fibrosis, tuberculosis and lung cancer for the operation. In some cases endovascular occlusion can stop or decrease bleeding in patients with stage IV cancer.

TEMPORARY CAVA-FILTERS IMPLANTATION

V.P. Burov, V.I.Prokubovsky, S.A.Kapranov, V.F. Kuznetzova (Moscow)

Removable vena cava filters were implanted presumably as a temporary construction in 87 patients during the period of September 1997 - October 2004. Removable cava-filters "Zontik" /Umbrella/ (78) and removable filter-stents (9) were used.

Temporary vena cava filter (VCF) implantation was performed in a specially selected group of young or middle-aged patients without concomitant diseases.

Removable filters were implanted for the period necessary for elimination of the embologenic floating thrombus in the inferior vena cava or its tributaries. Removal of the vena cava filter was indicated after lifting the threat of pulmonary arterial thromboembolism (PATE) and achieving adequate reaction of the hemostasis system to anticoagulation therapy.

Temporary implantation of VCF "Zontik" was performed for the period of surgical and catheter thrombectomy (21), regional thrombolysis (8), anticoagulation therapy (39), and before surgical interventions in gynecologic and trauma patients (10).

VCF "Zontik" was removed in 38 (48.7%) of 78 patients within 2 to 64 days. In 40 patients VCF were not removed due to embolism into VCF (8), filter thrombosis (8), persisted PATE threat (17), patient's refusal to remove filter (3), technical failure (3), patient's death (1).

Filter-stent planned as temporary was implanted in 9 patients: in 5 patients - into the common iliac vein, in 3 patients - into the external iliac vein and in 1 patient - into the inferior vena cava.

In 1 patient filter-stent was removed 15 days after the implantation, in the other patients filters were not removed due to embolism into the CF and persisted floating thrombosis.

Examination of patients with removed VCF revealed no signs of PATE during the long-term period (2-62 months).

Thus temporary cava-filters implantation can effectively prevent pulmonary embolism. It also allows patients to avoid long-term presence of a foreign body in the organism and helps to maintain patency of the inferior vena cava.

ENDOVASCULAR TREATMENT OF VARICOCELE

V.N. Perepelitzyn, O.G. Karakulov (Perm)

During the period from 1993 till 2004 we performed X-ray guided endovascular occlusion in 803 patients with varicocele. Bilateral lesion was diagnosed in 7 patients. Patients were aged from 11 to 55 years old; of them 660 patients (82.3%) were under 20 years old. Relapsed varicocele after Ivanissevich's operation was observed in 74 patients (9.2%). Renal and testicular phlebography revealed the following variants of the internal spermatic veins: in 513 patients (63.9%) - a single trunk, in 251 patients (31.3%) - two trunks, in 34 (4.2%) - three trunks, in 5 patients (0.6%) - four trunks. For the embolization of internal spermatic vein 3% solution of Thrombovar was used in all patients. An immediate positive clinical result was observed in all patients. Relapsed varicocele was diagnosed in 21 patients within 1 month - 2 years after the endovascular treatment; in 16 of them (76.2%) the relapse was successfully treated with repeated endovascular occlusion of the internal spermatic vein.

Thus endovascular occlusion of the internal spermatic vein is a highly efficient treatment of varicocele and its relapses.

REMOVABLE STENT-FILTER FOR THE PREVENTION OF PULMONARY ARTERIAL THROMBOEMBOLISM

S.A.Kapranov, V.F. Kuznetzova, A.G. Zlatovratsky (Moscow)

Though vena cava filters (VCF) are considered to be efficient for prevention of pulmonary arterial thromboembolism (PATE) in urgent situation, this method has a number of serious disadvantages revealed in the long-term period: first of all, frequent total occlusion of inferior vena cava (IVC), perforation of IVC walls by VCF and destruction of the endovascular construction.

In order to eliminate these disadvantages, in the Federal Centre of X-ray Guided Surgery (Ministry of Health, Russian Federation) original removable intravenous stent-filters made of nitinol and designed as a "closed" construction were implanted in 12 patients with embolism-threatening thrombosis of the deep veins of the inferior extremities and pelvic veins.

In 5 cases stent-filter was implanted in the common iliac vein, in 3 cases - in the external iliac vein, in 4 cases - in the infrarenal part of inferior vena cava approached via subclavian, jugular or femoral veins.

Anticoagulation therapy, venotonics, compression stockings were used in all patients during the post-implantation period.

After stent-filter implantation in the iliac vein (8) the filter was removed in 1 case at the 15th day post-procedure due to transformation of the embologenic thrombus of the femoral vein into the occlusive lesion and disappearance of PATE threat. In the other 7 cases the stent-filter was left as a permanent endovascular device.

Long-term follow up (3 to 9 months after the intervention) showed that 3 out of 7 patients with stents developed iliac vein occlusion below the implanted stent-filter due to embolism into the filter; in 4 out of 7 patients veins remained patent.

We did not observe any progressing thrombosis above the stent-filter, IVC occlusion or PATE signs in the patients. Moreover, stent-filter promoted early recanalization of the occluded deep veins of the lower extremities that was observed in 6 out of 7 patients.

In 4 patients stent-filter was implanted in the IVC. In 3 out of the 4 patients the intervention was caused by external compression of the IVC due to a tumor and there was a threat of perforation of the IVC walls by standard cava-filter models. In one case the implantation of a stent-filter was caused by the impossibility to use other filtering devices due to abnormal left-sided IVC entering the superior vena cava.

Examination of the patients over the long-term period (4 to 18 months) revealed no destruction of the metallic stent-filter construction or signs of IVC perforation.

Thus, the use of intravenous stent-filters is one of the promising methods of endovascular prevention of PATE. It helps to avoid negative consequences of implantation of permanent cava-filter models.

«Stenting of "Unprotected" Left Main Coronary Artery»

STENTING OF THE LEFT MAIN CORONARY ARTERY AS AN ALTERNATIVE TO CABG OPERATION

V.V. Chestukhin, B.L. Mironkov, A.S. Inozemtzev, A.B. Mironkov, V.V. Bondarenko, I.G. Riadovoy (Moscow)

Forty (40) procedures of left main coronary artery stenting were performed between 1998 and 2004 in patients, in whom surgery was impossible. In 7 patients drug-eluting stents were used. In 31 patients the procedure was performed in the unprotected left main coronary artery. There were no deaths during hospital stay.

Our results suggest, that balloon occlusion of left main coronary artery for 20 sec. and more in cases with concomitant occlusion of the right coronary artery is associated with gradual decrease of systolic and pulse pressure, which return to normal after balloon deflation. Importantly, no case of transitory (below 30 sec) obstruction of heart arterial flow was complicated by ventricular asystolia or fibrillation.

In 19 cases we used intraaortic balloon counterpulsation (IABC) without any complications.The use of IABC in patients with acute coronary syndrome or left ventricular failure simplifies the stenting of left main coronary artery and reduces the risk of this procedure.

Accurate work-out of stent implantation techniques and the use of drug-eluting stents increase the efficacy and safety of the procedure.

RESULTS OF THE STENTING OF THE LEFT MAIN CORONARY ARTERY IN DIFFERENT CLINICAL SITUATIONS

A.B. Protopopov, T.A. Kochkina, E.P.Konstantinov, D.P. Stoliarov, P.G. Gavrikov, Ya.O. Fedchenko (Krasnoyarsk)

Purpose of the study: to assess the efficacy of left main coronary artery stenting in different CHD patient groups.

Materials and methods: stenting for the left main coronary artery (LMCA) stenosis was performed in 38 patients with CHD aged 46 to 68 years (there were 34 men). The patients were divided between the two groups: 1) Stable angina - 30 patients; 2) Acute coronary syndrome (ACS) - 8 patients; in Group 1 stenting of LMCA was performed after coronary bypass grafting. In 4 patients from Group 2 the intraaortic counterpulsation was used.

Results: immediate success of the intervention was 100% in stable angina group vs 87.5% in ACS group. The long-term results of catheter interventions in patients with LMCA stenosis were assessed at 3 months to 5.5 years. Restenosis was found in 2 patients (6.7%) from Group 1 and 1 patient (12.5%) with ACS. Clinical success (reduction of angina, increase of exercise tolerance) was evident in all Group 1 patients. Follow-up duration in patients with LMCA stenting performed for AMI was 3 - 36 months.

Conclusions: stenting in CHD patients with LMCA stenosis may be effective and safe in various clinical situations, providing good long-term results.

STENTING OF THE UNPROTECTED LEFT MAIN CORONARY ARTERY: EARLY AND LATE RESULTS

D.G.Iosseliani, S.P.Semitko, A.V. Kononov (Moscow)

The purpose of the study consisted in the evaluation of immediate and long-term clinical and angiographic results of stenting of the unprotected left main coronary artery (LCA).

Material and methods: from June 2002 till September 2004 direct stenting of LCA for its critical stenosis was performed in 13 patients. The majority of patients were men (n=9, 69,2%), mean age of patients was 58,6±12,2 years. Dislipidemia was present in 63,6%, arterial hypertension in 81,8%, smoking habits in 45,5%, 5 patients (38,5%) had a history of myocardial infarction. AMI at admission was present in 27,3% of patients. Clinical signs of acute heart failure were revealed in 7,7% of cases. Routine in-hospital examination revealed mean EF of 44,5±4,6%. Physical exercise threshold was 62,5±2,4 Wt in average. Coronary angiography revealed hemodynamically significant lesion of LCA (>75,9%) in all patients. In 1 patient (7,7%) there was acute occlusion of LCA. Ostial lesion of LCA was seen in 54,5%, bifurcational lesion spreading into the major branches of LCA - in 45,5% of cases.

Results of study: direct stenting of LCA was carried out in 92,3% of cases, in 1 cases (7,7%) of acute LCA occlusion mechanical recanalization and PTCA of LCA were needed. The following types of stents were used for the stenting of LCA: Multilink Tetra, Penta, BxSonic, R-Stent Evolution, Dexamet. In 7,7% of cases (n=1) two stents were implanted in the LCA. Mean implantation pressure was 12,4±1,6 Atm., mean implantation time - 19,3±0,7 sec/ Mean diameter of the implanted stent was 3,8±0,6 mm with mean length of 19,3±1,2 mm. Good angiographic results (TIMI III) were achieved in 100% of cases. In all cases the procedure was performed without complications. In 27,3% of cases simultaneous endovascular interventions were performed in other vessels, including with "debulking" technique (7,7%), in 7,7% of cases the intervention was performed on several arteries. In-hospital period was smooth in all the patients, all of them were discharged in stable condition. 61,5% of patients (n=8) were restudied in average 5,4±0,6 months after the stenting of LCA. Angina symptoms recurrence was noticed in average at 1,5 months after the stenting procedure. In 37,5% of cases angina of different functional classes persisted. Control angiography revealed the rate of in-stent stenosis and LCA stenosis of 50%. In 12,5% (n=1) of cases in-stent stenosis if LCA necessitated repeated intervention, in 3 patients (37,5%) the CABG surgery was recommended. Late mortality after LCA stenting was 12,5% (n=1).

Conclusion: the stenting of the left main coronary artery is a safe and effective procedure allowing for adequate restoration of the vessel's lumen. However late in-stent stenosis and stenosis in different segments of LCA are seen in about one half of cases. Further accumulation of experience is necessary for the solution of problems related to endovascular procedures on this segment of the coronary circulation.

STENTING OF THE LEFT MAIN CORONARY ARTERY IN A FEMALE PATIENT WITH ACUTE LEFT VENTRICULAR DYSFUNCTION

V.I.Ganiukov, A.A. Shilov, N.I. Sussoev, I.N. Shigantzov, E.A. Levchenko. I.Yu. Bravve (Novosibirsk)

Purpose of the report - to present a case of successful left main coronary artery (LMCA) stenting in a female patient with acute coronary syndrome (ACS) causing left ventricular (LV) dysfunction.

Materials and methods: Patient U., aged 51, was admitted to hospital on June 13, 2002 with acute heart failure due to acute coronary syndrome, which had resulted from large lower myocardial infarction (MI). Selective coronary angiography showed 95% LMCA stenosis, occlusion of the right coronary artery middle portion, proximal 50% stenosis of the circumflex artery (prox. CA), 70% LAD stenosis in the distal portion, right-sided type of heart circulation. Extreme risk of bypass grafting (BG) suggested the use of LMCA stenting. The procedure was performed with IABC, continuous intravenous injection of nitroglycerine and common doses of antithrombotic agents. Two coronary guidewires were introduced on 8F JL4 catheter into circumflex artery and LAD. On the next stage, a balloon catheter (20 mm in length and 2.5 mm in diameter) was introduced on the guidewire and the stenosis of main LCA was predilated (12 atm., 15 sec). This guidewire was used to introduce Bx Sonic stent (13 mm in length, 3.5 mm in diameter) into the area of LMCA residual stenosis with its further implantation from LMCA into LAD through CA origin and on a guidewire positioned in CA with 10 atm. After we had confirmed, that CA origin had no substantial stenosis, coronary guidewire was removed from beneath the stent in CA origin. Then it was again introduced into CA through the stent branch. On completion of intervention "kissing" dilation of the stent branch and modeling of the stem stent portion (balloons: LAD/CA - Bx Sonic stent delivery system balloon 15 mm - 3.5 mm/"U-pass" 30.0 mm - 3.0 mm; LAD/CA pressure - 6/8 atm.) were performed. Completion CA showed successful result of the intervention. IABC balloon was removed 1 day after the intervention and the patient was discharged at day 10 postoperatively. Successful BG was performed 2 months later for stable angina in order to achieve complete myocardial revascularization.

ENDOVASCULAR TREATMENT OF THE "UNPROTECTED" LEFT MAIN CORONARY ARTERY

V.A. Porkhanov, A.N.Fedorchenko, M.G. Shmatkov, R.S. Tupikin, D.A. Korj, A.V. Porkhanova (Krasnodar)

Purpose: to assess the feasibility and efficacy of endovascular

management of left main coronary artery lesions.

Materials and methods: A total of 649 patients have underwent 911 coronary interventions for CHD in the Department of Interventional Radiology since January 2003. Left main coronary artery lesion were found in 19 (2.9%) patients (among them 16 men) aged 45 to 74 years. In 15 cases (78.9%) the interventions were for grade III-IV stable angina and in 4 cases (21.0%) the interventions were for acute coronary syndrome.

Isolated lesion of the left main coronary artery was found in 14 patients (73.7%), a combination of left main coronary artery stenosis with stenosis of LCA branches - in 3 patients, a combination of LMCA stenosis and RCA stenosis - in 2 patients. In 1 case the LMCA stenosis was accompanied by right coronary artery occlusion. In 8 cases the lesion was located in LMCA origin, in 3 cases the stenosis was prolonged, in 8 cases the lesion was located in bifurcation.

Altogether, 26 stents were implanted in this patient group. Stenting was preceded by balloon predilatation in all patients. Usually a temporary endocardial electrode was introduced into the LV.

Results: mortality rate was 0%. All patients experienced substantial clinical improvement even during hospital stay. Follow-up coronay angiography was performed in 8 patients. Of these, 6 had no flow-limiting stenoses, 2 had restenosis necessitating repeated balloon angioplasty.

Conclusions: endovascular management of of left main coronary artery is an effective and safe procedure, particularly in patients with isolated LMCA stenosis as well as whenever bypass grafting is impossible.

RECANALIZATION AND PTCA OF TOTALLY OCCLUDED LEFT MAIN CORONARY ARTERY IN ACUTE MYOCARDIAL INFARCTION

D.G. Iosseliani, S.P. Semitko, A.V. Koledinsky, I.Yu. Kostianov (Moscow)

Purpose of this work was to analyze the results of endovascular treatment of acute occlusive lesion of the LCA in patients with AMI within the first hours after the onset of the disease.

Material and methods: between January 2000 and February 2005 we performed 1128 endovascular interventions for AMI. Acute occlusion of the LCA (being the infarct-related lesion) was observed in 4 patients (0,35%). All those patients were males, their mean age was 56,2±17,4 years (48 - 68 years). Diagnostic coronary angiography and PTCA were performed in all cases within the first 6 hours after the onset of the disease (mean, 4,8±1,1 hours). By the moment of interventions all the patients presented with increasing acute left ventricular failure (in 2 cases corresponding to Killip class 2, in two other cases - Killip class 3); in 3 patients there were signs of cardiogenic shock (systolic AP <90 mm Hg). Left ventricular ejection fraction (LVEF) by the moment of the procedure was 21,8±11,1%. In two cases the intervention was performed at the background of intraaortic balloon counterpulsation.

Results: in three cases adequate blood flow in the LCA system was restored, with this in two cases angiographic result of the procedure (mechanical recanalization, PTCA and stenting of the LCA with stent transition to the LAD ostium with subsequent debulking procedure and the grafting of the ostium of the CxA) was judged as optimal, in one cases - as satisfactory (blood flow in the LCA system corresponded to TIMI 2). In one case antegrade blood flow could be restored only in the LAD. Despite adequate restoration of the blood flow in one case and partial effect of the procedure (restoration of blood flow in the LAD) in another case, two patients died of increasing left ventricular failure on the background of areactive cardiogenic shock. Another two patients were discharged in rather satisfactory condition (without signs of circulatory insufficiency). One of those patients died suddenly 4 months later (presumably, arrhythmogenic death). The fourth patient was examined at 8 months. His LVEF rose from 23 to 31% (at the expense of infarct-related segments of the LV). Control coronary angiography revealed in-stent restenosis, which necessitated successful one-stage PTCA procedure (with "kissing" balloons) with good angiographic and clinical effect.

Conclusion: the prognosis of patients with AMI caused by the occlusion of the left main coronary artery, despite adequate restoration of the blood flow in the LCA system performed within the first hours after the onset of the disease, remains poor. Maybe it would be more promising in such cases to conduct combined treatment including systemic thrombolythic therapy at pre-hospital stage with subsequent performance of the emergency endovascular procedure after patient's admission to the special facilities.

«Interventional Transvascular Radiology in the Treatment of Renal and Hepatic Diseases»

STENTING OF THE RENAL ARTERIES

T.Collins (New Orleans, USA)

Abstract not submitted.

ANGIOPLASTY AND STENTING OF THE RENAL ARTERIES

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P. Dundua, A.M. Babunashvili (Moscow)

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

Material and methods: 101 patients with vasorenal hypertension were operated on, among them 78 men, aged 28-61 years. All of those patients had high arterial hypertension of 5-25 years duration. Mean systolic AP was 192,6+34,5 m Hg, with diastolic pressure of 110,2+13,5 mm Hg. The diagnosis of vasorenal hypertension was established on the clinical basis and confirmed by the data of duplex scaning. Critical stenoses with kidney function disturbances were observed In 15 cases. In 32 patients stenosis degree was over 70%, in 69 patients - 50%-70% of the diameter of intact arterial segment. Two patients presented with single kidney. PTA was performed in all patients, with stent implantation in 99 of them. In 2 cases the intervention was carried out through transradial approach. Control ultrasound investigation was performed at 6 and 12 months.

Results: the results of PTA and stenting were followed for 12 months in 86 patients (85%). 11 patients stopped the uptake of hypotensive drugs, 60 patients noticed a significant decrease of therapeutic doses; marked arterial hypertension, caused by kidney function disturbances at parenchymal level (nephrosclerosis, nephropathy), persisted in 15 patients. In 10 patients (16%), among them in 2 with implanted stents, restenoses of different degree were revealed: from 30 to 40% in stented patients and from 40 to 70% in non-stented patients. Repeated PTA and endografting carried out in 8 patients (12%) gave good clinical effect. In stented patients repeated PTA wasn't performed because of hemodynamically insignificant restenoses.

Conclusions: restenosis after adequate PTA of the stenotic renal artery is mostly probable during the first 6 months (15%). The absence of hemodynamically significant restenoses in stented arteries conforms the necessity of endografting after PTA in cases with residual stenoses. Stenting of the renal arteries is a reliable method for the prevention of restenoses.

ANGIOPLASTY OF THE RENAL ARTERIES: EARLY AND LATE RESULTS

A.S. Vradi, D.G. Iosseliani, S.P.Semitko (Moscow)

Purpose of the study: to evaluate the effectiveness of endovascular procedures (angioplasty and stenting) on the renal arteries.

From 1997 till October 2004, 48 patients with vasorenal arterial hypertension (VRH) underwent 56 endovascular procedures on the renal arteries: 16 PTA and 40 stenting procedures, among them 20 direct stentings. In 47 patients renal arteries stenosis was of atherosclerotic origin, in 1 patient there was fibromuscular dysplasia. Unilateral lesion of the renal artery was revealed in 35 patients, bilateral - in 12 patients, 1 female patient with doubling of the right renal artery had 3 occluded vessels: 2 right and 1 left renal arteries. Ostial localization of renal arterial stenosis was revealed in 38 cases, localization in the 1st segment - in 11 cases, in one case the stenosis affected the primary branch of the left renal artery. The degree of renal arterial stenosis prior to endovascular procedures was 75% in average.

Results: good angiographic result immediately after PTA was achieved in 15 cases (94%), in 1 case the result was judged an unsatisfactory (residual stenosis of 60%). Stenting procedure was successful in 39 cases (97%). One procedure was complicated by occlusive dissection, in another case intra-procedural thrombosis of the iliac-femoral segment at the side of puncture occurred. Both cases necessitated surgical treatment.

According to ultrasonic examination, in all the cases of successful PTA procedure there was a tendency towards the increase of kidney surface at the side of the damaged artery by 17% in average. Marked hypotensive effect was seen in all cases immediately after endovascular treatment, among them in 25% of cases there was a tendency towards the lowering at the expense of the decrease of maximal AP elevation values, with working pressure maintenance at the previous level. Temporary deterioration of renal function immediately after the procedure was seen in 12 patients (25%).

Long-term results were followed in 24 patients (6-12 months), among them 5 patients after PTA and 19 - after stenting procedure. Long-term results of 4 PTA (80%) and 16 stenting procedures (84%) were assessed as good. In one patient with up to 90% restenosis at 6 months after PTA stenting was attempted with good results. In 1 case there was a hemodynamically significant kinking of the renal artery distal to the stent, in another - in-stent stenosis up to 70%; PTA was successfully performed. In another patient the stent previously implanted into the proximal segment of the renal artery, got stenosed up to 60% due to the "sliding" of athermatous masses from the aorta, with the involvement of renal artery ostium; the stent implantation into the ostium gave good effect.

In long-term follow-up primary hypotensive effect was preserved in 67% of cases, in 33% hypertension resumed.

At control investigation (at 6-12 months) the deterioration of the renal function, as compared with the baseline values, was not seen, the improvement was revealed in 43% of patients, with renal function normalization in 21% of cases.

Conclusions: the angioplasty of the renal arteries, irrespective of the type of the procedure (PTA and stenting), is an effective method for the restoration of the blood flow in the renal arteries and leads to marked hypotensive effect and renal function improvement in a significant part of cases. The rate of restenoses after endovascular procedures is 15-20%. In some cases those changes can be corrected with endovascular methods.

DIAGNOSTIC AND MEDICAL POSSIBILITIES OF PERCUTANEOUS TRANSHEPATIC FIBROCHOLANGIOSCOPY

S.A.Kapranov, T.B. Boldina, V.F. Kuznetzova (Moscow)

In the Faculty Surgery Clinic of Russian State University we have an experience of transhepatic endobiliary interventions performed between 1986 and 2004 in 839 patients with obstructive jaundice.

In 85 patients the surgery was accompanied by antegrade transhepatic fibrocholangioscopy. A total of 94 transhepatic endoscopy study procedures were performed in this patient group.

In 42 (49.4%) cases the obstructive jaundice was of benign origin. The causes were: choledocholithiasis (n=21), iatrogenic or postoperative stricture of hepatic duct, common bile duct or hepaticojejunoanastomosis (n=8), a combination of these (n=9), and Mirizzi's syndrome (n=4).

In 43 (54.4%) cases the cause of bile duct occlusion was tumor, 26 patients had pancreatic carcinoma, 4 - cancer of major duodenal papilla, 6- hepatic or common bile duct carcinoma, 1 - Klatskin's tumor, 3 - metastasis to hepatic hilus. Occlusion of previously implanted endobiliary stents was found in 3 patients.

Thirty (30) patients underwent mechanical or electrohydraulic lithotripsy with balloon dilation accompanied by transhepatic endoscopy. In 8 cases severe stricture of common bile duct was removed, 4 of these occurred after endobiliary dissection and elimination of intraductal ligatures.

In 43 patients with malignant tumor causing obstructive jaundice transhepatic fibrocholangioscopy with target forceps biopsy provided reliable information of the level and the type of hepatic and common bile duct tumor.

In conclusion, transhepatic antegrade fibrocholangioscopy during endobiliary interventions provides most comprehensive information of the bile duct disease and predicts the most rational strategy and technique of various interventions performed in order to achieve maximum clinical improvement, minimum complications and better long-term results.

OUR EXPERIENCE WITH ENDOBILIARY INTERVENTIONS

A.N. Maltzev, A.M. Kostiunina, A.A. Maltzev (Ulianovsk)

Patients and methods: between 1997 and 2004 we have per-

formed 287 percutaneous transhepatic endobiliary interventions in 251 patients (162 men) aged 5 to 87 years (mean age 54.31±4.43 years). The history of obstructive jaundice was 1 week to 3 months. Serum bilirubin level was 190 - 650 μ mol/l.

Causes of jaundice were:

- Hepatic, pancreatic or duodenal carcinoma - 217 patients;
- Choledocholithiasis - 3 patients;
- Benign strictures of common bile duct or biliary-enteric bypass - 28 patients (including 1 congenital stricture in a 5-year child);
- Anhepatic jaundice due to compression by enlarged lymph nodes in patients with lymphogranulomatosis - 3 patients.

Surgical technique: Under local anesthesia and fluoroscopic guidance segmental duct of the affected lobe was punctured (as a rule, in patients with anhepatic obstruction segmental duct of the right lobe was punctured). If we managed to advance the guide-catheter system beyond the obstruction area, combined external and internal drainage was established (183 cases), otherwise only external draining was performed (68 cases). In 11 patients with hepatic, pancreatic or duodenal cancer we implanted 12 stents. "Safety" drainage was left for 2 weeks following stenting. All stenting procedures were technically successful. Early results of stenting were good in all patients. The jaundice reduced, homeostasis parameters returned to normal values at 2 - 2.5 weeks. Of the 11 patients, who underwent surgery, 8 had a long-term follow-up (6 months to 1 year). Of these, 6 died from the underlying illness, 2 had in-segment reocclusion causing recurrence of obstructive jaundice. In such patients biliary drainage was performed.

Complications of endobiliary interventions were: Parenchymatous bleeding caused by liver capsule rupture in 9 cases (all patients were operated on, 3 deaths occurred). In 3 patients the surgery was complicated by subcapsular bile leakage and subcapsular hematoma (all cases successfully managed by draining). Two patients developed iatrogenic biliary peritonitis (both patients underwent surgery), another two patients had drainage dislocation into the abdominal cavity (both underwent repeated draining).

Conclusion: Similar longevity of patients with hepatic, pancreatic and duodenal carcinoma, who underwent abdominal surgery compared to patients, who underwent palliative intervention (due to high malignancy of tumor), inability to operate on liver hilus tumor and less traumatic character of endobiliary interventions make the latter not merely and alternative to abdominal surgery, but a method of choice.

RECURRING BLEEDINGS IN UROLOGICAL PRACTICE - POSSIBILITIES OF ENDOVASCULAR CORRECTION

A.E. Vassiliev, M.V. Vlassov, M.B. Solonetz (Vladimir)

Purpose: to optimize the treatment in patients with bladder carcinoma and life-threatening recurring bleeding by means of endovascular hemostasis.

Materials and methods: We have performed a total of 38 internal iliac artery (IIA) embolization procedures in 19 patients with bladder cancer (all patients were men aged 35 to 84).

The following aspects must be pointed out:

1. We did not try to achieve complete occlusion of IIA or super-selective catheterization of IIA, since chronic hematuria has parenchymatous origin, therefore, reduction of arterial blood flow in IIA territory is sufficient.
2. The intervention must be performed on both sides, considering the characteristics of pelvis vasculature.
3. Interventions consisted of 2 stages (right IIA and left IIA embolization with an interval of 7-14 days).
4. Gianturco coils were used as embolization material.

Results: in 17 patients the macrohematuria had ceased and didn't recur for 6-12 months of follow-up. Hematuria was evidently, but incompletely, reduced in two patients, and was further managed by hemostatic agents.

Conclusion:

1. Endovascular intervention is a method of choice to secure hemostasis in patients with life-threatening recurring bleeding due to inoperable bladder carcinoma.
2. Persistent hemostatic effect can be achieved by partial reduction of arterial blood supply using Gianturco coils implanted into proximal portions of the internal iliac arteries.

FIRST EXPERIENCE WITH OIL EMBOLIZATION OF THE HEPATIC ARTERY IN LIVER DISEASES

V.A. Ivanov, M И. Tzarev, I.V. Trunin, A.V. Filippov, Yu.A. Bobkov,
S.A. Terekhin, S.V. Volkov, V.L. Smirnov, S.S. Slovakovsky,
I.V. Mostovoy (Krasnogorsk)

Between May 2004 and September 2004 we have performed oil embolization of hepatic artery (OEHA) for primary and metastatic lesions to 12 patients. Two patients had hepatocellular carcinoma, 10 patients had metastases due to cancer of different location.

The method implies simultaneous injection of chemotherapy agent and reduction of arterial blood flow in the liver, thus increasing the time when the chemotherapy agent acts on tumor tissue.

In most cases the OEHA was performed in two stages: embolization of the right hepatic artery and the left hepatic artery with an interval of one week.

We used standard approach: selective catheterization of the right or the left hepatic artery followed by injection of chemotherapy agent (Doxorubicin in 11 patients and Oxaliplatin in 1 patient) and oil contrast media (lipiod 5-15 ml). Milled hemostatic sponge was additionally used depending on the degree of flow reduction.

Immediate success rate was 100%. There were no intraoperative complications. All patients had postembolization syndrome of various severity within a day following embolization (fever, nausea, vomiting). All symptoms were managed medically in the Department of Surgery.

Three patients had partial effect after the first OEHA course, therefore, the second course was performed.

One patient died 3 weeks after embolization of to tumor progression. Another patient had an abscess in a metastatic lesion located in the right liver lobe after the second course of embolization. The abscess was drained, but the patient died in three days of hepatorenal failure.

The first experience with this method in patients with inoperable liver tumor suggests has demonstrated its efficacy and requires further investigation.

SYNDROME OF CHRONIC ABDOMINAL ISCHEMIA POSSIBILITIES OF ENDOVASCULAR TREATMENT

A.E. Vassiliev, S.V. Yakoniuk, A.A. Dydykin (Vladimir)

Purpose of the study was to optimize the treatment for chronic abdominal ischemia (CAI)on the basis of endovascular methods.

Material and methods: we assessed 14 patients (among them 10 women) aged 23 to 78 years with symptoms of abdominal ischemia. All patients subsequently underwent angiography.

Celiac trunk angiography revealed compression of the celiac trunk (CT) in 10 patients (71.4%), among them 8 women. In two patients we found atherosclerotic plaque causing CT stenosis, in one female patient we found combined CT stenosis (atherosclerosis + compression), and kinking of the superior mesenteric artery SMA - in another patient.

After preoperative disaggregant therapy dynamic PTA was performed in two patients with atherosclerotic lesion of the celiac trunk, direct stenting was performed in 7 patients with extravasal compression of CT and in 1 patient with SMA kinking. In four patient with arterial diameter below 5 mm we used matrix coronary stents ("Guident" stents were used in 3 patients and "Cordis" stents - in another one). In the remaining four patients we used peripheral stents ("Jomed" stents were used in 3 patients and "Blue medical" stents - in 1 patient). Good hemodynamic effect was achieved in all cases.

Disaggragents were administered postoperatively.

The patients were followed-up during 3-12 months. Clinical success was achieved in all patients (reduction of pain and dyspepsia). Follow-up Doppler study and duplex study showed no signs of restenosis at the site of reconstruction.

Conclusions: extravasal compression of the celiac trunk is found in 71.4% of patients with chronic abdominal ischemia, which makes the problem of abdominal ischemia crucial in both elderly and people of reproductive age. Extravasal compression of CT and SMA can be adequately managed by transluminal techniques.

EMBOLIZATION OF INTRA-ORGAN ARTERIES OF THE LIVER - THE TREATMENT FOR HEMORRHAGIC YATROGENIC COMPLICATIONS OF INTERVENTIONAL RADIOLOGICAL INTERVENTIONS

B.I. Dolgushin, V.A. Cherkassov, E.R. Virshke, A. V. Kukushkin (Moscow)

Purpose: to determine the incidence of hemobilia after endo-

biliary interventions and to assess the efficacy of embolization of injured intrahepatic arteries as a treatment option.

Method: we assessed patients with massive hemobilia causing tamponade of bile ducts after percutaneous transhepatic endobiliary interventions performed in 550 oncology patients.

Results: bleeding occurred in 13.6% of patients after puncture cholangiostomy. Massive hemobilia causing tamponade of bile ducts occurred in 17 (3.1%) of these patients. The causes of hemobilia in this patient group were: arteriobiliary fistula in 16 patients, bleeding from the tumor in 1 patient. The time of development of hemobilia ranged from 2 to 30 days postoperatively.

Embolization of intrahepatic arteries with metal coils, medical felt and medical silk was performed to secure hemostasis in 15 patients. The procedure didn't require general anesthesia. Recurrent bleeding was observed in 1 patient at 2 months postprocedure. This was successfully managed by repeated embolization of the intrahepatic artery.

Embolization of intrahepatic arteries for hemostasis was ineffective in a single case, which necessitated open surgery.

Conclusion: The results suggest, that embolization of intrahepatic arteries injured during radio-guided draining endobiliary intervention, causing the formation of arteriobiliary fistulas, is a highly effective method to secure hemostasis with 93.5% success rate.

«Endovascular Surgery of the Aorta and Peripheral Arteries»

ENDOVASCULAR ANGIOPLASTY FOR THE REVASCULARIZATION OF THE LOWER LIMB

A.N.Androsov, Yu.V. Suslin (Samara)

A total of 139 endovascular interventions have been performed to 103 patients with atherosclerosis involving iliac and limb arteries between 1996 and 2004. There were 96 men (93.2%). Chronic critical limb ischemia was observed in 77% of patients. Lesions involving common iliac artery (CIA) were found in 49 patients, external iliac artery - in 36 patients, common femoral artery (CFA) - in 8 patients, superficial femoral artery (SFA) - in 21 patients, deep femoral artery (DFA) - in 1 patient and popliteal artery - in another patient.

Catheterization of femoral artery was performed through one of the three different approaches (depending on the stenosis location): retrograde femoral approach, antegrade femoral approach, contralateral femoral approach. Recanalization for occlusions was performed in 47 patients (45.6%) with catheter-guide (guidewire catheter or hydrophilic guide). In all patients recanalization was followed by stenting. Stenting was also performed in patients with intimal dissection and atheromatous lesions, which couldn't be managed by angioplasty at standard pressure.

In 29 patients with two-level stenosis PTA of iliac artery was followed by surgical reconstruction of femoral artery. In all cases open surgery was secondary to angioplasty.

Angiographic success was defined as restoration of antegrade flow, with no up-stream intimal dissection and unchanged peripheral vascular territory (no distal embolism). Good clinical outcome was defined as complete reduction of pain in patients with trophic disturbances, pain-free walking distance above 500 m; satisfactory outcome - as substantial decrease of pain, increase of pain-free walking distance up to 500 m; dubious outcome - as reduction of pain without any significant increase of pain-free walking distance.

Immediate success was achieved in 91% of all cases. Nine (9) patients with poor results had lesions of the tibial arteries, 5 of these had diabetes mellitus. Three patients underwent early above-knee amputation. Early complications of angioplasty (1 day postoperatively) included puncture site bleeding in 2 patients and pulsatile hematoma necessitating closure of artery wall defect in 1 patient.

Endovascular dilation as a separate method in indicated only for isolated stenosis (occlusion) of a single arterial segment. Combined interventions in patients with multi-segment stenoses of aortoiliac or femoropopliteal segments significantly reduce the risk of surgery and the hospital stay. The use of stents is associated with broader indications to endovascular interventions.

ENDOGRAFTING OF ISOLATED ANEURYSMS OF THE ILIAC ARTERIES

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P.Dundua, A.M. Babunashvili (Moscow)

Purpose: to assess the clinical results with self-expanding drug-eluting nitinol stents for isolated aneurysms of the iliac arteries.

Materials and methods: we used self-expanding nitinol drug-eluting stents for percutaneous endovascular grafting of isolated aneurysm of iliac arteries in 15 patients. A total of 18 drug-eluting stents were implanted. Bilateral endografting was performed in 3 patients. We used 14F delivery system.

Results: Immediate success (complete isolation of aneurysm with no endoleak) was observed in all cases. The procedure was complicated by distal embolism in 1 patient. Long-term results were assessed at 2 to 48 months. No late complications (endoleak, disclocation and fragmentation of stent-graft) were found.

Conclusion: Percutaneous endovascular grafting of iliac artery aneurysms using self-expanding nitinol drug-eluting stents is a method of choice for this condition.

USE OF ANTI-EMBOLIC PROTECTION OF THE DISTAL BED DURING ENDOVASCULAR PROCEDURES ON THE LOWER LIMB ARTERIES

V.V. Demin, A.N.Jeludkov, V.V. Zelenin, A.V. Demin, A.K. Almakaev (Orenburg)

We have used protection filter for infrainguinal reconstructions 7 times in 6 patients (one patient underwent bilateral angioplasty of superficial femoral artery). All patients were men (mean age 58.3 + 2.9). The length of occlusion was 1.5 to 12 cm (mean length 9.9±3.1 cm), the degree of femoral artery stenosis (% area) in two patients was 89% and 90%, respectively. The indications for anti-embolic protection were: soft debris causing occlusion as suggested by angiography (accumulation of contrast medium) or revealed during recanalization (easy advancement of guidewire and catheter through the occlusion area); in case of stenosis - plaque ulceration, markedly eccentric plaque, floating fragments of plaque or emboli. All interventions were performed through antegrade femoral approach. In patients with stenosis the anti-embolic filter was placed distal to the stenosis site prior to any other manipulation. In case of occlusion the filter was advanced after recanalization with hydrophilic guidewire and angiography catheter. Difficulties in advancement were only encountered in one patient. Stenting was used in three (42.9%) patients.

Decrease or complete cessation of blood flow through the filter during intervention was observed in 4 cases (57.1%). In these patients the filter contained macroscopic blood clots or small plaque fragments. In the first patient a large cylindrical fragment 3 mm in diameter and 5 mm in length was removed with the filter. No cases of distal embolism were observed. Normal blood flow was restored in all patients. In 4 patients the pain-free walking distance was unlimited, regression to stage I ischemia was achieved in one patient, another patient had IIA ischemia postoperatively. One case of femoral artery re-occlusion was observed in the long-term period (7 months postoperatively), the remaining patients had persistent effect.

Therefore, the use of anti-embolic protection devices during infrainguinal reconstruction is not only possible, but also useful when indicated.

EMERGENCY EMBOLIZATION FOR PERIPHERAL VESSELS' TRAUMA

G.E. Belozerov, S.M. Bocharov, S.A.Prozorov, A.B. Klimov, N.R. Chernaya, V.E. Riabukhin (Moscow)

Purpose of the study: to assess the potential and efficacy of embolization for peripheral arterial injury.

Materials and methods: between 1995 and 2004 a total of 140 patients with peripheral arterial injury have been examined. In 16 patients (11%) endovascular embolization was performed after examination. Among these there were 15 men, the age of patients ranged from 15 to 73 years (mean age 34 years). Eight patients underwent embolization of aortic arch branches (axillary and brachial arteries or their branches, internal thoracic artery, vertebral artery); another 8 patients underwent embolization of lower limb arteries (DFA or its branches in 6 patients, shin arteries in 2 patients). Various coils and microembolization material (Trufill) or a combination of these were used for embolization.

The analysis showed, that the main indication to embolization of peripheral arteries must be the fact, that this method allows to achieve the same objectives as conventional surgery does, however, with less injury, faster and more efficiently. Endovascular embolization is preferable as an alternative in cases with difficult and invasive surgical approach to the vessel surrounded by large hematoma.

ENDOVASCULAR TREATMENT OF DISTAL EMBOLISM AFTER PTA ON THE LOWER LIMB ARTERIES

K.B. Klestov, A.A. Dubinin, V.I.Chirkov, A.P. Perevalov (Ijevsk)

Purpose of the study: to determine the potential of endovascular therapy for distal thromboembolism.

Materials and methods: between January 2000 and January 2004 PTA of lower limb arteries was complicated by distal embolism in a total of 5 patients. There were 2 patients with embolism of popliteal artery trifurcation, 3 patients with embolism of shin arteries causing occlusion and subsequent ischemia. All patients were successfully managed by catheter aspiration thromboembolectomy with complete restoration of blood flow.

Conclusions: our experience of catheter aspiration thromboembolectomy for distal embolism following endovascular procedures gives the ground for further use of this method.

ENDOVASCULAR SURGERY FOR THE OCCLUSIONS OF FEMORO-POPLITEAL SEGMENT

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, Д.S. Kartashov, D.P.Dundua, A.M. Babunashvili (Moscow)

Purpose: to assess the immediate and long-term results of angioplasty of femoral and popliteal arteries.

Materials and methods: a total of 181 patients with peripheral arterial disease underwent angioplasty of femoral and popliteal arteries with implantation of 394 stents, including 39 popliteal artery stents.

The follow-up was 4 months to 8 years.

Results: immediate success was achieved in 92% of recanalization and stenting procedures. In the long-term period (2 years following surgery) the cumulative primary patency rate was 76.0% compared to cumulative secondary patency rate of 84.5%. Repeated interventions were performed in 24 patients.

Conclusion: recanalization and angioplasty for occlusions of femoro-popliteal segment provides immediate success in the majority of cases with favorable long-term outcome. The results of angioplasty vary with the length and location of lesion. The patients require postoperative observation to reveal early restenosis or de novo stenosis.

ENDOVASCULAR TREATMENT IN PATIENTS WITH DIABETIC FOOT SYNDROME

I.A. Eroshkin, M.A. Zelenov, L.S.Kokov, A.O. Zhukov (Moscow)

The study enrolled 34 diabetic patients with limb ischemia of various degree, who underwent PTA for stenoses of lower limb arteries. Mean age of patients was 60 years. The disease duration was 1 to 30 years (mean duration 11 years). The degree of limb ischemia was IIB in 8 patients, III in 2 patients, IV in 25 patients. Lesion length in the are of angioplasty was 2 to 8 cm. In total, there were 36 stenoses and 24 occlusions. PTA of the iliac segment was performed in 16 patients, superficial femoral artery - in 13 patients, popliteal artery - in 8 patients, tibial arteries - in 25 patients. Stenting was performed in 23 cases. The stents were deployed in iliac segment (8 patients), superficial femoral artery (6 patients), popliteal artery (2 patients), tibial arteries (7 patients).

Results: technical success rate was 100 %. Mean follow-up was 2 years (range 1 month to 3.5 years). Primary patency rate at 2 years was 98 %. Clinical success at 2 years was 70.5 %. PTA was accompanied with bypass surgery in 3 cases (femoro-popliteal bypass). Total mortality rate during follow-up was 5.8 % (2 patients: 1 patient with myocardial infarction at day 14, 1 patient with stroke at day 2). Complication were observed in 5.8% of cases: stent dislocation from common iliac artery into the external iliac artery and thrombosis of brachial artery, which was used for endovascular approach; another patient had puncture site hematoma. Above-knee amputation was performed in 6 cases due to progression of atherosclerosis and when revascularization was technically unavailable.

Conclusion: Short-term results of PTA in patients with "diabetic foot syndrome" are similar with those of bypass surgery and help to avoid amputation in the majority of subjects.

LATE RESULTS OF ENDOVASCULAR TREATMENT FOR CHRONIC OCCLUSIONS OF SUPERFICIAL FEMORAL ARTERIES

K.B. Klestov, A.A. Dubinin, V.I. Chirkov, A.P. Perevalov (Ijevsk)

We performed 48 endovascular interventions for occlusive-stenotic lesions of the superficial femoral artery (SFA) in 42 patients, including 19 recanalizations of SFA occlusion, between January 2000 and November 2003. The length of occlusion was 2.0 to 160.0 mm. A total of 14 stents were implanted in 8 patients. The long-term follow-up (3 months to 3 years) included 42 (87.5%) patients. Clinical success was achieved in 35 (80%) patients. In 7 (20%) patients the results of endovascular therapy were considered inadequate. All these patients had restenosis or reocclusion at the site of intervention. Long-term in-stent restenosis or complete occlusion of the artery at the site of stenting was observed in 5 patients. Repeated interventions were performed in 4 patients. Dilation of in-stent restenosis was performed in 3 patients and caused occlusion due to intimal dissection within the stent in a single patient, necessitating implantation of additional stent (stent in stent). Immediate outcome of the repeated intervention was satisfactory in all patients. In 2 patients the in-stent restenosis developed after repeated intervention.

Conclusions: endovascular therapy is sufficiently effective for SFA occlusive-stenotic lesions. Restenosis after endovascular therapy can be managed by repeated intervention.

«Miscellaneous - 1»

TREATMENT OF BIFURCATIONAL LESIONS WITH ML FRONTIER STENTS

M. Lesiak (Poznan, Poland)

Abstract not submitted.

LONG-TERM ANGIOGRAPHIC CONTROL OF PTCA AND STENTING

I.V. Pershukov, M.S. Olshansky, S.I. Kuznetzov, E.Yu. Moreva (Voronej)

Purpose of the study was to assess the remodeling of coronary artery at the site of PTCA and stenting in the long-term period.

Materials and methods: a total of 83 patients with CAD symptoms underwent PTCA with stenting between October 2002 and September 2004. All patients were discharged without serious complications. Of these, 12 patients were admitted repeatedly for angina recurrence and underwent follow-up coronary angiography.

Results: all patients were men aged 43 to 59 (mean age 52.1±5.1). The initial procedure was performed in LAD in 8 patients and in RCA - in 4 patients. Primary PTCA was performed in 11 of the 12 patients, 3 patients had nearly optimal angiographic outcome and didn't require stenting. In the remaining 8 patients balloon dilation was followed by stent implantation. One patient underwent direct stenting. The follow-up was 2 to 14 months (mean value 6±3 months). Restenosis after balloon dilation was found in all patients, however, there were no occlusions. All these patients underwent stenting of the previously dilated arterial segment. In 7 the 9 patients after coronary stenting the study revealed restenosis at the site of stent implantation. These patients underwent repeated intervention as well, in 5 of the 7 cases a new stent was deployed, in 2 patients successful result was achieved by PTCA alone.

Conclusion: angina recurrence after PTCA is associated with significant restenosis. In the majority of patients the recurrence of angina is caused by in-stent stenosis. In such patients repeated interventions are, as a rule, effective and safe.

IMMEDIATE AND MID-TERM RESULTS OF CORONARY STENTING USING BX SONIC И BX VELOCITY STENTS (CORDIS, USA) IN PATIENTS WITH CAD

D.G.Iosseliani, S.P.Semitko, D.G.Gromov, P.Yu. Lopotovsky (Moscow)

Purpose of the study was to assess the immediate and mid-term results of coronary stenting with matrix BX stents of similar design: BX Sonic and BX Velocity (Cordis, USA).

Materials and methods: between January 2001 and October 2004 a total of 584 BX stents (112 BX Velocity and 472 BX Sonic stents) were implanted into 26 coronary arteries of 491 patients. Follow-up examination was conducted in 281 (57.2%) patients 7.8 ± 2.4 months after stenting and included coronary angiography. A total of 324 stents (62 BX Velocity stents 262 BX Sonic stents) were assessed.

Results: immediate angiographic success was achieved in 98.8% of cases. Hospital mortality rate was 0.4%. Follow-up coronary angiography showed the total incidence of stenosis and stent occlusion of 32.1% and 2.5%, respectively. Correlation analysis (Spirmen rank correlation) showed significant indirect correlation between in-stent stenosis and arterial diameter; location of lesion in the origin or proximal portion of LAD; difficult baseline morphology of plaque (type C and chronic occlusion) on the other hand. Meanwhile, in patients with the absence of all of these three "risk factors" of restenosis (n = 46 stents) the rate of unfavorable mid-term angiographic outcome was 6.5%.

Conclusions: the use of matrix BX Velocity and BX Sonic stents (Cordis, USA) ensures immediate angiographic success in the vast majority of cases (98.8%). While in the mid-term follow-up the frequency of in-stent stenosis was high - 32,1%, however individual approach to patients selection and stenosis provides good long-term results of endovascular procedure.

SHUNTOGRAPHY IN PATIENTS AFTER CORONARY BYPASS SURGERY

M.S. Olshansky, I.V. Pershukov, S.A.Kovalev (Voronej)

Purpose of the study was to assess the state of autovenous and autoarterial anastomoses in the long-term follow-up after coronary bypass surgery.

Materials and methods: from October 2002 to October 2004 15 patients with previously performed coronary bypass surgery were admitted to Voronezh Regional Clinical Hospital #1. All of them underwent control coronary angiography and shuntography because of angina recurrence.

Results: internal mammary artery (IMA) was used for bypass grafting in 11 out of 15 patients. At the moment of control examination, in average 5±3 years after the operation, IMA stenoses or occlusions were revealed in 5 patients, while in 6 patients IMA functioned normally. Only 4 out of 15 patients who received venous grafts had their grafts functioning, with this the function could be judged as adequate maximum in 1 graft. Two functioning grafts with hemodynamically significant changes were seen only in 1 patient.

Conclusion: the majority of patients with angina recurrencde studied in average 5 years after surgery have their autovenous grafts occluded or poorly functioning. In only one fourth of patients there is one working autovenous graft. With this autoarterial anastomosis of internal mammary artery remains without significant hemodynamic changes in more than half patients.

DYNAMICS OF THE MAIN FUNCTIONAL LV DISTURBANCES IN POSTIFARCTION PATIENTS BEFORE AND EARLY AFTER STENTING, AS JUDGED BY EchoCG DATA

B.E. Shakhov, E.V. Chebotar, E.B. Shakhova (Nijny Novgorod)

We studied 65 patients with a history of MI. Twenty-four patients had a Q-wave AMI, 41 patients presented with non Q-wave MI. There were 55 men, mean age of patients was 54 ± 9 years.

Selective coronary angiography revealed single-artery lesion in 22 patients, two-arteries lesion in 26 and three-arteries lesion in 17 subjects.

Forty (40) patients had LV hypertrophy (hypertrophy of the interventricular septum (IVS) in 26 patients, hypertrophy of LV posterior wall (LVPW) in 1 patient, concentric LV hypertrophy in 9 patients). Diastolic dysfunction (hypertrophic type) was found in 42 patients.

The patients were examined on admission and 3-8 days following stenting.

Results: after stenting there was a predominant decrease of end-diastolic volume (29 patients), while end-systolic volume was commonly unchanged (25 patients). Ejection fraction and stroke volume tended to increase in the majority of patients (40 and 24 patients, respectively). In 5 subjects myocardial function returned to normal within a short time after stenting, in a single patient there was transient local hypokinesia after stenting. In 18 patients the diastolic function returned to normal within a short time after stenting and resumed in 6 patients after stenting.

Conclusion: in the majority of patients we found early positive changes of basic LV function characteristics as suggested by early post-stenting EchoCG.

CORONARY STENTING IN PATIENTS WITH CAD: EARLY AND LATE RESULTS

A.V. Arablinsky (Moscow)

Purpose of the study: to investigate the immediate and long-term clinical and angiographic outcome of coronary stenting in patients with chronic forms of CAD.

Materials and methods: we assessed 515 patients (mean age 53.6 ± 4.7 years), who underwent implantation of 733 stents. Grade 1, 2, 3, 4 angina (ACC) was found in 13 (2.5%), 149 (28.9%), 252 (49.0%) and 96 (18.6%) cases, respectively. Stenosis of a single artery or two arteries was observed in the majority of patients (60.6%). Radiological and morphological type of lesion (ACC/AHA) was A, B1, B2 or C in 136 (18.6%), 212 (28.9%), 205 (28.0%) and 180 (24.5%) cases, respectively. Most patients underwent elective stenting (76.5%). Direct stenting without PTCA was performed in 212 (28.9%) patients. A single stent was implanted in 342 patients; two stents were implanted in 131 patients; three stents - in 39 patients; four stents into three different arteries - in three patients.

Results: Angiographic success (TIMI III antegrade blood

flow and <30% residual stenosis) was observed in 99.6% of cases. Clinical success rate was 98.8%; stenting resulted in completely reduction of angina during hospital stay. The rate of cardiac events was 1.2 %: death in 3 (0.6%) cases, acute myocardial infarction in 2 (0.4%) cases, the need for surgery in 1 (0.2%) case. A total of 493 (95.7%) patient were available for the long-term follow-up (6.0 ± 0.5 months). Survival rate was 99.8%. There was one death (0.2%), 2 cases of myocardial infarction (0.4%), 2 cases necessitating coronary bypass grafting (0.4%). The majority of patients had no angina 309 (62.7%), grade I, II, III or IV angina was found in 58 (11.7%), 62 (12.6%), 39 (7.9%) and 25 (3.9%) patients, respectively. In the majority of patients (72.8%) there were no signs of ischemia as suggested by stress test, in addition, there was a significant increase of exercise tolerance from 65.2 ± 6.6 W to 90.7 ± 8.6 W, p<0.03. Follow-up angiography demonstrated in-stent restenosis or stent occlusion in 112 (19.6%) and 18 (3.2%) cases, respectively. Predictive factors of negative outcome were: B2 or C type of lesion, recanalization of coronary artery occlusion, eccentric plaque, over 15 mm stenosis length, artery diameter of 2.75 mm or less, the use of a wire stent.

Conclusion: stenting for coronary stenosis is effective and safe method for restoration of adequate antegrade blood flow in the vast majority of patients, leading to improvement of the patients' clinical state. The long-term efficacy of stenting is characterized by high survival rate; low incidence of acute myocardial infarction; absence of myocardial ischemia, absence or reduction of angina; no signs of myocardial ischemia at stress testing and increased exercise tolerance.

CARDIAC RHYTHM VARIABILITY DURING AND AFTER CORONARY ANGIOGRAPHY AND STENTING IN PATIENTS WITH CAD

E.Ya. Parnes, D.G. Iosseliani (Moscow)

Patients with unstable angina (UA) have cardiac rhythm variability (CRV) more commonly as compared to patients with stable angina. Considering the fact, that frequently the morphological soil for UA is plaque rupture, purpose of the study was to test the hypothesis, that plaque rupture during PTCA and stenting is associated with decreased CRV.

Materials and methods: we assessed 63 CAD patients. Coronary stenting was performed in 41 patients, coronary angiography - in 22 patients. All patients underwent 24-h blood pressure monitoring (Cardiotens-01) and Holter ECG monitoring with detection of time and spectrum CRV variables on the day of coronary angiography and stenting. We analyzed cardiac interval 2 h prior to CA and stenting, during the procedure, 11 h following the procedure and during sleep. To compare CRV values at different time intervals mean values were calculated for each hour of monitoring.

Results: There was significant decrease of all CRV values in patients after CA, stenting with prior CA or direct stenting. However, there was a difference between degree and duration of CRV decrease in various groups of CAD patients. CA resulted in less substantial decrease of CRV as compared to stenting: during night the CRV increased and nearly returned to baseline. In patients, who underwent stenting for occlusion of coronary artery (TIMI 0), immediate decrease of the values after the procedure was most pronounced, in contrast, night-time values were only slightly increased and comparable with night-time CRV values in patients with TIMI III blood flow after stenting. The changes of CRV values during CA and stenting in CAD patients were opposite. In patients with high baseline CRV the latter increased, which can be attributed to the modulating role of deep breaths and breath holding during the procedure. CAD patients with TIMI III blood flow had episodes of sharp decrease of CRV (LF<40 ms2) during balloon inflation.

Conclusions: The occurrence of the most durable and marked decrease of CRV in cases of stenting of occluded coronary arteries with subsequent partial restoration of CRV during night suggests, that besides the effect of cytokines, CRV substantially depends on reperfusion phenomenon.

EVALUATION OF PULMONARY HYPERTENSION DEGREE IN PATIENTS WITH LARGE POSTINFARCTION SCAR DURING LEFT VENTRICULAR CATHETERIZATION

V.V. Plechev, I.V. Buzaev, V.S. Buzaev, I.A.Nagaev (Ufa)

Purpose of the study was to assess the degree of pulmonary hypertension in patients with postinfarction cardiosclerosis during catheterization of the left ventricle. All patients underwent coronary angiograpy, left ventriculography, measurement of pressure in pulmonary artery, left and right ventricles.

We found correlation between systolic pulmonary pressure (SPP) and left ventricular end-diastolic pressure (LVEDP) (R = 0.61; p = 0.0002).

Regression equation was SPP = 16. 908 + 0.71619*LVEDP. We also found correlation between mean pulmonary pressure (MPP) and left ventricular end-diastolic pressure (LVEDP) (R = 0.69; p = 0.00094).

MPP = 9.0016 + 0.63451* LVEDP

Therefore, measurement of left ventricular pressure during catheterization prior to ventriculography ensures the evaluation of pulmonary hypertension degree without pulmonary artery catheterization.

OUR EXPERIENCE WITH THE USE OF PTCA FOR THE TREATMENT OF CAD

A.V. Kuzmenko, A.I. Nefedov, N.V. Vinogradov, V.S. Kuzmenko (Kaliningrad)

Purpose of study - to show the effectiveness of modern methods of interventional cardioangiology in the treatment of CAD.

From January 2003 until September 2004 26 endovascular interventionsa were performed in 23 patients. The groups of patients were distributed as follows: the procedure was carried out in 6 (26%) patients with acute coronary syndrome, in 3 (13%) patients with unstable angina. Stable exertion angina (FC IV-III) was revealed in 12 (52,3%) patients, of FC II - in 2 (8,7%) patients. The age of patients varied from 31 to 67 years (mean, 51±4,7 years), CAD duration varied from 2 to 24 months. Four (17,3%) patients had the history of one or several myocardial infarctions. Single-vessel lesion was revealed in 16 (69,6%) patients, multi-vessel lesion - in 7 (30,4%) patients.

Direct stenting was performed in 21 (80,8%) patients, PTCA - in 5 (19,2%) patients. Good angiographic result was achieved in 24 (92,4%) cases. After endovascular interventions clinical state of patients changed as follows: 16 (69,6%) patients were angina-free, FC I angina was seen in 4 (17,3%) patients, of FC II - in 2 (8,7%), of FC III - in 1 (4,1%) patient. 15 (65,2%) patients were studied in the long-term follow-up (6 -18 months); among them 12 (52,2%) patients underwent clinical examination, and in 3 (13,1%) coronary angiography was performed. A pre-stenosis (up to 50% of arterial lumen) was revealed in one patient. One-year survival without serious complications was 95,6%, one patient (4,3%) needed the aorto-coronary bypass surgery.

Our results suggest the high effectiveness of PTCA and stenting in the treatment of CAD.

CRV SIGNIFICANCE IN THE EVALUATION OF THE CONDITION OF PATRIENTS WITH CAD AFTER CORONARY STENTING

D.G. Iosseliani, E.Ya Parnes, A.V. Khitry (Moscow)

Cardiac rhythm variability (CRV) was studied 24 hours before and 24 hours after coronary stenting in 62 patients with CAD. At 6 months the rate of in-stent restenosis was reliably higher in patients with unstable angina and in patients with stable angina, in whom CRV values were as low as in patients with unstable angina. PTCA and stenting result in significant decrease of spectral CRV values, with this their value and ratio become similar to those of patients with unstable angina. Thus, the damage of coronary vessel's intima in one site only is sufficient to cause the changes of CRV proper to unstable angina. Stenting does not influence CRV in patients with unstable angina. The study of CRV before coronary stenting allows to identify the group of patients at high risk of restenosis. With daily LF below 600 ms^2 restenosis occurs in 70% of cases.

«Interventional Radiology in Obstetrics and Gynecology»

UTERINE ARTERIES EMBOLIZATION IN UTERUS MYOMATA

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P.Dundua, A.M. Babunashvili (Moscow)

Purpose: to assess the effectiveness of uterine arteries embolization (UAE) as the main method to treat uterine myomata.

Methods: Between June 2003 and November 2004 UAE was performed to 112 patients with symptomatic uterine myomata. In the majority of cases the UAE was the primary intervention, in 6 patients percutaneous embolization was conducted for recurrent myomata after laparoscopic myomectomy. The age of female patients was 30 to 54 years. The size of myomata ranged from 6 to 23 weeks of pregnancy.

Results: technical success was achieved in 111 patients. In a single patient we failed to perform selective catheterization of uterine arteries. In another patient embolization of a single uterine artery was performed because of the failure to cannulate contralateral uterine artery. There were no complications. In 111 patients we observed uneventful recovery after UAE with reduction of all symptoms. The size of myomata decreased by 50-80% within 6 months. In a single case necrotic vaginal discharge was observed 6 weeks after successful UAE. In another case, despite the reduction of myomata size by 45%, the patient had abundant menses within 3 months postoperatively.

Conclusion: UAE is an effective and safe method to treat uterine myomata. Adequate technical equipment and special training can make UAE the commonly used method to treat the most common disease in women.

OUR FIRST EXPERIENCE WITH ENDOVASCULAR TREATMENT OF UTERUS MYOMATA

V.N. Perepelitzyn, O.G. Karakulov, V.A. Kuznetzov (Perm)

Between October 2003 and July 2004 we have performed endovascular occlusion of 28 uterine arteries in 14 female patients aged 29 to 51 years for uterine myomata. The size of myomata was 22 mm (for multiple nodes) to 110 mm (for single node). The nodes were serous-interstitial and/or interstitial. Embolization of uterine arteries was performed with foam-rubber particles and antibiotics in 9 patients, PVA particles in 5 cases (Cordis). Postoperative fever persisted for 1-7 days (mean duration 3.2 days). Hospital stay after uterine arteries embolization was 2 to 9 days (mean value 5.2 days). Good outcome was observed in 13 patients (92.8%) within 1-6 months postoperatively (reduction of myomata, pain and hemorrhagic syndrome).

High rate of successful uterine arteries occlusion performed for uterine myomata and positive clinical outcome provide optimistic prospects and wide clinical acceptance of this technique.

VARIANTS OF BLOOD SUPPLY OF UTERUS MYOMATA IN THE LIGHT OF UTERINE ARTERIES EMBOLIZATION

S.A.Kapranov, B.Yu. Bobrov, I.A. Krasnova, N.A. Shevchenko, A.A. Alieva, V.B. Aksenova (Moscow)

Purpose: to assess the predictive value of uterine-ovarian anastomosis of different types during uterine arteries embolization for uterine myomata.

Materials and methods: between October 2002 and October 2004 uterine arteries embolization (UAE) was performed to 325 female patients with uterine myomata. Radiological and ultrasound study revealed variable uterine and ovarian vasculature in 169 (52%) patients. The abnormalities were divided between the following groups:

- Type I - anastomosis between uterine and ovarian arteries with predominant blood flow direction towards the uterus (I-a) or the ovary (I-b),
- Type II - ovarian blood supply only through the branches of uterine artery,
- Type III - branches of ovarian artery carrying blood to the uterus and the myomata.

Type I was found in 108 patients (33 patients with type I-a, 6 patients with type I-b, combination of types 1-a and 1-b in 69 patients). Type II was revealed in 12 patients and type III - in 6.

Results: Long-term results of UAE were assessed within 1-23 months postoperatively (mean follow-up - 10.1 months).

We found correlation between clinical outcome of UAE and various types of blood supply of uterus and ovaries.

Postembolization syndrome was less pronounced in patients with type I and type III vasculature compared to patients with typical blood supply of the small pelvis. Type II vasculature had no effect on the severity of postembolization syndrome.

In 14 out of 29 patients with isolated type I-a or type III blood supply the reduction of myomata size was significantly lower (by 25% on average), in 3 patients there was no effect. In these patients active circulation persisted in a part of the myomata postoperatively.

And, finally, we found that in patients with type I-a and type I-b blood supply the efficacy of UAE for uterine myomata largely depended on the surgical technique and adequate selection of the type and the size of embolization particles.

Conclusions: Assessment of small pelvis blood supply variants prior to uterine arteries embolization for uterine myomata to a large extent predicts the clinical outcome and the choice of optimal surgical tactics.

UTERINE ARTERY EMBOLIZATION IN GYNECOLOGICAL PATIENTS WITH UTERINE BLEEDINGS OF DIFFERENT ETIOLOGY

G.E. Belozerov, N.I. Tikhomirova, O.N. Oleynikova, M.A. Karasseva, K.A. Romanov (Moscow)

Purpose of the study was to evaluate the results of hemostasis and of intraoperative blood loss reduction. Indications to endovascular embolization were bleeding due to uterine myomata or to endometriosis of the uterine body (n=40), to uterine body carcinoma (n=4), to uterine cervix carcinoma (n=10) and to uterine sarcoma (n=1).

Materials and methods: Endovascular hemostasis was secured in 55 patients with gynecological emergency. The majority of endovascular interventions (n=36) were performed through unilateral transfemoral approach, bilateral approach was practiced in 19 cases. Embolization of 92 uterine arteries (UA) and 13 internal iliac arteries (IIA) was performed. Gianturco coils and Trufill embolization material were used for IIA and UA embolization. To provide better visualization and superselective catheterization of UA the study was performed in the 20-30° right and left oblique projections. Hemostasis after IIA and UA embolization was secured in all patients. There were no complications.

Therefore, uterine artery embolization (UAE) is an effective method and, perhaps, an alternative to radical surgery in patients with gynecological emergency causing bleeding. UAE provides effective hemostasis and either allows to avoid surgery or minimizes the intraoperative blood loss.

FIRST EXPERIENCE WITH ENDOVASCULAR TREATMENT OF UTERUS FIBROIDS IN STAVROPOL REGION

O.G. Kuznetzov, V.A. Aksenenko, L.V. Starichenko, M.A. Sletkova, N.A. Sletkov, O.A. Samko, I.V. Faians, A.V. Kuprianova, A.L. Khodus, L.V. Loskutova (Stavropol region)

Since September 2004 we have performed 5 uterine artery embolization (UAE) procedures. All patients were of child-bearing age (mean age 35 years). The indications were large myoma of uterine body in 2 patients (12-13 weeks of pregnancy) and large uterine myoma causing symptoms associated with adjacent organs (bladder). Preoperative assessment included bimanual examination, small pelvis ultrasound study, small pelvis magnetic resonance study, duplex ultrasound study, hysteroscopy with diagnostic dilatation and curettage of cervical and uterine mucous membranes. Embolization of uterine arteries was performed in interventional radiology unit under spinal anesthesia with additional sedation in a conscious patient. Mean duration of embolization procedure was 50 minutes. Two patients had angiospasm, which was successfully managed by intraarterial administration of 0.75 mg nitroglycerine. We used COOK catheters (Roberts), CORDIS coronary guidewires, COOK embolization material (PVA-500) and SHERING contrast medium (Ultravist-370). Four patients suffered moderate pain in the early postoperative period, which was managed by nonopioid analgesics and NSAID. In a single patient the pain was severe and

required opioid analgesics. All patients had increased body temperature below 37.5 °C after the intervention. Mean postoperative hospital stay was 3 days.

CHOICE OF THE METHOD OF TREATMENT FOR VARICOSE DISEASE OF PELVIC VEINS

S.G. Gavrilov, S.A.Kapranov, V.F. Kuznetzova,
A.G. Zlatovratsky (Moscow)

Purpose: to develop a plan for the definition of indications to any of the surgical methods for varicous disease of pelvic veins (VDPV) treatment.

Materials and methods: we assessed 40 patients with VDPV. The age of patients was 25 to 43 years. All patients underwent ultrasound study of pelvic and ovarian veins. To assess the degree of venous congestion in the small pelvis we used radionuclide emission computed tomography of the pelvic veins. All patients in whom surgery was indicated, underwent selective ovariography to determine the type of ovarian veins anatomy.

Results and discussion: We followed the following plan to select the type of VDPV surgery:

1. Endovascular technique is indicated in patients without concomitant varicose disease of the lower limbs, stem type of ovarian veins varicous transformation above 8-10 mm in diameter.
2. Laparoscopic technique was used in patients with concomitant varicose disease of the lower limbs, duplication of ovarian vein distal portion, additional varicose veins, travelling along the ovarian vein with atypical confluence. The patient's cosmetic concern was of great importance.
3. Open surgery was used in patients with concomitant gynecological diseases, varicose disease of the lower limbs and multi-stem ovarian veins.

The introduced scheme of VDPV treatment selection has been used for 3 years. During this period no patient had recurrent disease. In all patients we found complete reduction or significant decrease of VDPV symptoms 3-6 weeks postoperatively.

Conclusion: Surgical treatment of VDPV requires individual and differentiated approach to the choice of surgery type. We believe that the introduced scheme will ensure effective therapy and prevent recurrent disease.

POST-EEMBOLIZATION SYNDROME IN ENDOVASCULAR TREATMENT OF UTERUS MYOMATA

S.A.Kapranov, Yu. E. Dobrokhotova, B.Yu. Bobrov, A.A. Alieva (Moscow)

The experience of 258 uterine arteries embolization (UAE) procedures performed for uterine myomata in the Federal Center of Interventional Radiology (Russian Ministry of Health) and Obstetrics and Gynecology Department of the Russian State Medical University (Moscow) suggests, that this treatment is associated with specific postoperative recovery, which can be treated inadequately, thus causing severe complications of UAE and the choice of inappropriate treatment strategy.

We distinguished the following most characteristic symptoms of post-embolization syndrome after UAE:

1) pain,
2) blood-stained vaginal discharge,
3) hyperthermia,
4) leucocytosis,
5) hyperfibrinogenemia,
6) urination disroders,
7) gastrointestinal disorders,
8) cardiovascular disorders.

We assessed the post-embolization syndrome to be mild (7 points), moderate (8 14 points) or severe (15-21 points).

Depending on the symptoms the patients received infusion therapy, antibacterial agents, analgesics, anti-inflammatory agents when indicated.

In addition, during post-embolization period after UAE the patients were actively surveyed using follow-up examinations or permanent patient-physician communication system (round-the-clock contact via phone or Internet).

The algorithm developed for the management of post-embolization syndrome avoided any significant adverse events, which could necessitate hysterectomy.

USE OF UTERINE ARTERIES EMBOLIZATION FOR THE TREATMENT OF UTERUS MYOMATA: ANALYSIS OF 258 CASES

S.A.Kapranov, V.G. Breussenko., B.Yu.Bobrov, I.A. Krasnova, N.A. Shevchenko, A.A. Alieva, V.B. Aksenova (Moscow)

Between October 2002 and September 2004 we performed uterine artery embolization (UAE) procedures in 258 patients with uterine myomata (age 21 to 56 years).

Comprehensive clinical and instrumental examination revealed subserous-intramuscular myoma in 76 (29.5%) patients (type 0 - 7 patients, type 1 - 30 patients, type 2 - 39 patients), submucous-intramuscular myoma in 158 (61.2%) patients (type 0 - in 5 patients, type 1 - in 59 patients, type 2 - in 94 patients) and intramural myoma in 24 (9.3%) patients. In 44 (17.1%) cases the myoma was located in uterine cervix or isthmus, in 138 (53.5%) cases the myoma was located in uterine body, and in 76 (29.4%) cases - in the fundus of uterus. In 97 (37.6%) patients there was a single myoma, in 161 (62.4%) patients - multiple nodes (2 to 6, mean number 2.7).

The leading symptom in 143 (55.4%) patients was menorrhagia, associated with chronic iron-deficiency anemia in 76 of the patients; compression of adjacent organs in 46 (17.8%) patients; dyspareunia in 19 (7.4%) patients; sterility in 39 (15.1%) patients. Asymptomatic myoma was found in 11 (4.3%) patients.

Embolization of uterine arteries was performed through one-sided femoral approach in 255 (98.8%) patients, two-sided femoral approach - in 3 patients.

The procedure duration was below 20 min in 231 (89.5%) cases, and, in the majority of cases, the mean time of fluoroscopy was 3.7 min.

Each UAE required the use of 65 ml low-osmolar contrast medium (omnipak, ultravist) and 250 mg PVA particles.

There were no clinically significant complications.

Technical defects of the endovascular interventions included persistent spasm of uterine arteries after an attempt to cannulate them (3 patients; 1.2%) and contrast medium extravasation (2 patients; 0.8%) and didn't aggravate the patients' condition or require any specific care.

Long-term results of UAE in these patients have also confirmed its high clinical efficacy.

Within 1.5 years postoperatively we observed mean reduction of myomata from 11.4 to 2.6 cm and the size of uterus decreased from 13.6 weeks of pregnancy to normal values.

In 247 (95.7%) patients the symptoms of uterine myomata were completely or partially reduced, 98.1% of patients were fully content with the UAE intervention.

Three women conceived, in 1 patient the pregnancy resulted in delivery at term with twins.

NEW ALGORITHMS OF THE MIGRAINE DIAGNOSTICS AND TREATMENT - SUGGESTIONS FROM INTERVENTIONAL RADIOLOGISTS

A.E. Vassiliev, V.M. Emelianenko, L.A. Kofael, N.A. Dronova, S.V. Yakoniuk, M.V. Vlassov, A.A. Dydykin (Vladimir)

Purpose of the study: to improve the results of combined therapy for migrainous cephalgia using endovascular methods.

Materials and methods: between 1998 and 2004 we have assessed and treated 157 women aged 16 to 60 years (mean age 35.9±8.3), who had a 3-year history of migraine. Maximum history was 24 years. We distinguished the following clinical forms: migraine without aura in 94 (59.9%) patients with 4 of them suffering menstrual migraine; migraine with aura in 63 (40.1%) patients, including migraine with typical aura in 19 patients (12.1%), basillary form in 12 patients (7.6%), migraine associated with panic attacks in 11 patients (7.0%), migraine with prolonged aura in 8 patients (5.1%), aura without headache in another 6 patients (3.8%), and 3 (1.9%) patients had hemiplegic migraine; in addition, retinal form was found in 2 (1.3%) patients and ophtalmoplegic migraine - in another 2 patients (1.3%).

All patients underwent phlebography of ovarian and renal veins (patent № 2202281 "The method of ultrasound study and endovascular therapy for migrainous cephalgia in women"). Endovascular reconstruction aimed at the removal of renal-ovarian venous reflux (patent № 2202281 "The method of ultrasound study and endovascular therapy for migrainous cephalgia in women") was performed in patients with ovarian veins insufficiency after the investigation of renal and pelvic venous hemodynamics and when there were no contraindications.

Results: follow-up examination at 1-6 months postoperatively included 65 patients and revealed the following outcomes of the intervention: in 30 (46.2%) patients episodes of headache were completely reduced, in 13 (19.9%) patients they decreased sub-

stantially, in 7 (10.8%) patients the pain recurred at different time points (1 month to 1.5 years), in 15 (23.1%) patients the situation was practically unchanged, no cases of aggravation were observed.

Therefore, beneficial effect was observed in 66.1% of cases, transient beneficial effect - in another 10.8% of cases, no effect (negative outcome) was detected in 23.1% of cases.

Conclusion: whether the revealed rule plays the major role in the pathogenesis of migrainous cephalgia is unclear. However, the fact that renal-ovarian venous reflux and associated pelvic hypervolemia significantly contribute to the development of the disease is doubtless. The correlation between pelvic hemodynamics and ovarian function needs to be clarified in order to elucidate the problems of migraine pathogenesis and diagnosis. The potential of endovascular reconstruction will substantially change the results of treatment and facilitate the wide spread of these results into the medical practice.

«Non-Invasive Methods in the Evaluation of the Results of Endovascular Treatment of Cardiovascular Diseases»

DYNAMICS OF MB-CPK AND ST SEGMENT ON ECG AS A MARKER OF IRA OPENING AS JUDGED BY ANGIOGRAPHIC DATA IN PATIENTS WITH AMI

A.Yu. Lebedeva, A.A. Filatov, L.L. Klykov, E.V. Petrova (Moscow)

The most simple and available methods of noninvasive assessment of infarct-related artery (IRA) are the changes in ECG and cardiac enzyme levels. We assessed 164 patients with Q-wave myocardial infarction after systemic thrombolysis. The patients were divided between 3 groups depending on the coronary angiographic findings: group 1 (102 patients) - TIMI 3 blood flow in IRA, group 2 (23 patients) - TIMI 1-2 blood flow in IRA, group 3 (39 patients)- occlusion of IRA. ECG recorded 3 hours after the start of thrombolysis showed over 50% ST depression (in the leads with maximum ST elevation on the baseline ECG) in 94 patients from group 1 (92.1%), in 12 patients from group 2 (52.1%), and in 6 patients from group 3 (15.3%). Importantly, all 6 patients from group 3 received thrombolytic therapy 4-6 hours after onset of symptoms and the ECG changes can be considered natural infarction changes. The increase of CPK-MB at 3 hours after onset of thrombolysis as compared to the baseline values was 19.7% in group 1, 11.3% in group 2, and 5.4% in group 3 respectively. We found significant difference in the increase of cardiac enzymes between patients with reperfusion and patients with occlusion of the infarction-related artery ($p < 0.05$). Therefore, these methods can be effective markers of successful thrombolytic therapy and facilitate selection of patients for emergency endovascular intervention.

DOPPLER- AND PHLEBOGRAPHY IN THE CHOICE OF TREATMENT TACTICS IN CHILDREN WITH VARICOCELE

N.R. Akramov, I.N. Nurmeev, A.F. Khamidullin, (Kazan)

Between January 2004 and July 2004 we assessed 93 outpatients with varicocele. Scrotum ultrasound study revealed hypoplasia of the left testicle in 19 (20.43%) boys, suggesting high diagnostic value of the method. Indications for renal phlebography were clinically revealed recurrent, bilateral or unilateral varicocele (grade 2-3) with blood outflow disturbance in the left renal and/or common iliac vein as suggested by ultrasound study in 31 (33.3%) patients. According to the results of Doppler study, 9 children underwent phlebography of iliac veins with pressure measurement. Renal vein compression in the aorto-mesenterial segment with high pressure gradient between the left renal vein and inferior vena cava (IVC) was diagnosed in 22 patients, compression of the left common iliac vein between the right common iliac artery and lumbosacral spine - in 3 patients, ring-shaped left renal vein was found in 1 patient, stenosis of the left renal vein - in 1 patient, abnormal position of the inferior vena cava (IVC) causing aorto-mesenterial clamp (sinistroposition of abdominal IVC) - in 1 patient.

Four (4) adolescents had a combination of abnormalities: aorto-mesenterial "clamp" with compression of the left common iliac vein (2), ring-shaped renal vein with aortomesenterial "clamp" and compression of the left common iliac vein (1), aortomesenterial "clamp" and stenosis of the left renal vein (1). There was no significant difference in the pressure in the vessels studied between 8 patients. Possible complications of angiography (bleeding, thromboembolism or lower limb ischemia) were not observed.

We suggest tentative working classification of different degrees of venous renal hypertension: 0 (no hypertension) - pressure gradient between the distal left renal vein and IVC within 0 and 4 mm Hg (9 patients); 1 - pressure gradient within 5-9 mm Hg (11 patients); 2 - pressure gradient within 10-14 mm Hg (7 patients); 3 - pressure gradient 15 mm Hg and higher (4 patients).

In conclusion, the combination of diagnostic methods in patients with varicocele facilitates determination of the type and degree of venous blood blow disturbances in testicular veins. The choice of an optimal surgical and medical therapy for varicocele must rely on the radial examination results and on the suggested classification, providing substantial reduction of recurrences due to pathogenetic treatment.

RARE CASES OF CLINICAL USE OF INTRAVASCULAR ULTRASOUND SCANNING

V.V. Demin, A.N.Zheludkov, V.V. Zelenin (Orenburg)

We have an experience of IVUS in over 400 patients who underwent over 550 IVUS procedures in various vascular territories. These studies include instances suggesting great potential of the method in non-typical settings.

One patient underwent simultaneous endovascular intervention in the right coronary and right common iliac arteries. On completion of coronary stage, femoral approach was used for transvenous visualization of the iliac artery and control of angioplasty and stenting results. High-quality visualization of the inferior vena cava was obtained with 10 MHz probe, however, the diameter of sample volume hampered complete visualization of the artery. Good imaging of the target area was obtained with 10 MHz probe. With the probe positioned in the vein on-line detection of balloon inflation was achieved and, for the first time, we obtained continuous intravascular ultrasound visualization of self-expanding stent deployment.

Another patient with recurrent pulmonary thromboembolism was proposed for cava filter implantation, however, retrograde angiography of the iliac vein and the vena cava revealed suspected thrombosis at the level of the left renal vein. Repeated angiography performed in different modes didn't clarify this question. Therefore, IVUS was considered. With 20 MHz probe we obtained high-quality scan of the inferior vena cava without intraluminal thrombi, the study revealed deformation of the venous wall on the level of the left renal artery.

Another case refers to endovascular study performed prior to recanalization of arteriovenous fistula for chronic hemodialysis. The most dense area encountered during recanalization of arteriovenous fistulas was the site of anastomosis. An important factor is the condition of vein, which can hamper restoration of blood flow due to degenerative processes. In one case IVUS was performed to determine the origin of occlusion, predicted vessel diameter and adequate balloon size. The portion of the brachial artery adjacent to the anastomosis appeared unchanged; after recanalization the distal lumen diameter remained small up to the vein flexure; the lumen contained echolucent mass with dense areas at the site of anastomosis. We found deformation of the vein at the site of retrograde flexure, then the venous lumen regained its normal oval shape. Angioplasty with balloon of an adequate diameter resulted in high-velocity blood flow in venous portion and patent artery. IVUS performed after the intervention demonstrated round-shaped vein in all patients without any slow flow changes in Chroma Flo mode.

The above instances suggest high diagnostic potential of IVUS, which extends far beyond the conventional indications.

STATE OF THE LEFT VENTRICLE IN PATIENTS BEFORE AND EARLY AFTER CORONARY STENTING

B.E. Shakhov, Yu.V. Belousov, E.B. Shakhova (Nijni Novgorod)

Purpose of the study was to investigate the inpact of stenting on LV remodeling processes early after the procedure.

A total of 37 subjects were evaluated. There were 28 men. Mean age of patients was 54±9 years. There were 5 patients with postinfarction angina, 3 patients with postinfarction LV aneurysm, 10 patients with progressive angina, 17 patients with rest angina and angina of effort, 1 patient with painless angina; one patient presented with recent angina.

Selective coronary angiography revealed single-artery lesion in 9 patients, two-artery lesion in 18 patients, three-artery lesion in 10 patients.

Patients were assessed on admission and 3 - 8 days after stenting.

Most commonly, stenting was followed by decrease of EDV (16 patients) and increase of ESV (11 patients). EF in the majority of patients remained unchanged (15 patients), whereas the values of SV tended to decrease.

Diastolic dysfunction (type 1) was detected in 18 patients prior to stenting and in 16 patients after stenting. Segmental contraction disorders persisted in 12 patients out of 15. LV hypertrophy was unchanged after stenting.

NEW ULTRASOUND TECHNOLOGIES IN INTERVENTIONAL CARDIOANGIOLOGY

V.A. Sandrikov, G.V. Revunenkov, S.A.Abugov, T.Yu. Kulaguina

(Moscow)

Purpose: to assess the potential of intracardiac echocardiography (ICEchoCG) as a method of diagnostics and visualization during minimally invasive cardiac interventions.

Materials and methods: the study enrolled 44 patients: 22 with CAD, 12 with intracardiac conduction disorders, 4 with dilated cardiomyopathy, 4 with acquired heart disease, and 2 with congenital heart disease. All patients underwent ICEchoCG in one-dimensional M-mode and in two-dimensional B-mode, pulse and continuous wave Doppler study, color-coded Duplex mapping.

Results: ICEchoCG provides visualization of intracardiac blood shunting without the use of contrast medium, assessment of hemodynamic disturbances (as demonstrated by changes of end-diastolic (EDV), end-systolic (ESV) volumes, ejection fraction (EF), etc.). In most patients we detected and visualized blood flow in the pulmonary veins. In 12 cases of pacemaker implantation with ICEchoCG guidance there were no episodes of electrode dislocation, valvular dysfunction or other complications associated with implantation of a pacemaker with screw-in atrial electrode in a patient with abnormal geometry of heart chambers.

Conclusions: the use of ICEchoCG in combination with conventional angiography substantially facilitates adequate implantation of sequential pacemaker and non-contrast assessment of cardiac hemodynamics. This method is deemed perspective for percutaneous closure of interatrial septal defect and radiofrequency ablation with subsequent evaluation of cardiac hemodynamics changes.

MAGNETIC RESONANCE ANGIOGRAPHY IN THE DIAGNOSTICS OF OCCLUSIVE DISEASES OF LOWER LIMB ARTERIES

M.Yu. Volodiukhin, M.N. Malinovsky, M.M. Ibatullin, I.M. Mikhailov (Kazan)

Purpose of the study was to compare the potential of magnetic resonance angiography (MRA) and X-ray angiography for the assessment of changes in lower limb arteries.

Materials and methods: a total of 26 patients with various stages of lower limb ischemia underwent bolus MRA with prolonged manual injection of contrast medium simultaneously with table movement. Additionally, 2D TOF MRA of shin arteries was performed in all patients. X-ray angiography was conducted in all patients on the day of MRA.

Results: statistical evaluation of bolus MRA for visualization of pelvic segment suggested high sensitivity and specificity (97.74% and 92.31%, respectively). Visualization of the femoral arteries was characterized by 97.57% sensitivity and 94.57% specificity. In patients with severe shin ischemia visualization of the arteries was difficult, therefore the specificity was 44.58%. However, when used in combination with TOF MRA of shin arteries, this method exhibited sensitivity and specificity of 96.38% and 91.92%, respectively.

Conclusion: being a non-invasive study, MRA has high diagnostic value in patients with occlusive lesious of the lower limb arteries.

WHY LEFT VENTRICULAR EJECTION FRACTION CALCULATED BY STANDARD METHODS CANNOT BE A RELIABLE MEASURE FOR THE EVALUATION OF THE EFFECTIVENESS OF MYOCARDIAL REVASCULARIZATION

V.V. Chestukhin, S.G. Kolchanova, A.M. Naydich, B.L. Mironkov, O.V. Chestukhin, A.B. Mironkov, Yu.V. Kremleva, F.A. Bliakhman (Moscow, Ekaterinburg)

Nine patients with CAD of various severity underwent transesophageal sonography prior to and following angioplasty. Tracking of LV endocardial contour in different sections was used for 3D reconstruction of left ventricular (LV) image with further calculation of total ejection fraction (EF) and EF for each of the 24 regions of LV wall. In addition, LVEF was calculated using conventional methods (Simpson, area-length, Teicholz) in standard projections for ultrasound study. The accuracy of EF calculation was assessed on the basis of measurement error between the results of 3D image reconstruction and of each conventional method. The results of 3D image reconstruction suggested, that myocardial revascularization leads to the increase of EF, whereas the conventional methods failed to detect any significant differences between EF values prior to and following angioplasty. The study showed that the resulting value depends on the errors of EF calculation, originating from both the numerous parameters characterizing LV size and from the regional changes of cardiac wall function. Importantly, the greater is the difference between regional contributions to total EF, the higher is the error of EF calculation. We concluded that high functional heterogeneity of myocardium in CAD limits the use of EF measured by standard echocardiography as a reliable parameter characterizing the efficacy of myocardial revascularization.

X-RAY DIAGNOSTICS OF PULMONARY ARTERY THROMBOEMBOLISM AND ITS SECONDARY PROPHYLACTICS

S.V. Zakharov, V.V. Kucherov, S.A. CHernov, A.V. Gaydukov, N.V. Sokoliansky (Moscow)

Purpose of study: the evaluation of diagnostic significance of X-ray methods and of the effectiveness of endovascular prophylactics of pulmonary artery thromboembolism (PATE) syndrome.

Material and methods: retrospective analysis of patients with clinical manifestations of PATE who underwent complex X-ray diagnostics during the last 5 years was carried out. The group of study included the patients with primary and recurrent PATE, having potentially high risk of PATE due to thrombotic complications of different diseases. There were 217 men, mean age of patients was 59,5 years.

The analysis of the performed endovascular procedures and of the effectiveness of cava-filters used was carried out. A total of 151 cava-filters were implanted ("Sandglass " - 18; "TrapEase" - 121; "OptEase" - 12). We have noticed positive features of "TrapEase" and "OptEase" filters: the ease of implantation and retrieval, small diameter of the delivery system, high athrombogenicity.

Conclusions: consistent performance of complex X-ray diagnostics with subsequent realization of endovascular procedures - cava-filter implantation, catheter desobstruction, selective thrombolysis - is the optimal tactics for PATE diagnostics and prophylactics. The implantation of removable cava-filter "OptEase" suggested its high effectiveness.

«Miscellaneous - 2»

EARLY AND LATE RESULTS OF CORONARY STENTING WITH "BIODIVYSIO" STENTS

D.G. Iosseliani, I.S. Topchian, S.P.Semitko, (Moscow)

Between April 2000 and November 2003 a total of 131 phosphorylcholine-coated Biodivysio stents (Biocompatibles Ltd.) were implanted to 123 patients, among them 101 (82%) men. Mean age of patients was 56.7 ± 6.2 years. In 35% of cases (43 patients) stenting was performed for AMI, in 63% of these (27 patients) the procedure was performed within the first 6 hours from the disease onset. In 8% of cases (10 patients) the indication was unstable angina, in 57% of cases (70 patients) - grade 2-4 angina pectoris. Mean left ventricular ejection fraction was 63% ± 7% (5 patients with EF<40%).

Complete revascularization was performed in 64% of patients (n=79). In the majority of cases (59 patients; 44.8%) the stent was implanted into LAD; in 4 patients (3%) - into DA; in 2 patients (1.5%) - into a. intermedia; in 22 patients (16.8%) - into CxA; in 43 patients (32.8%) - into RCA, and, in a single patient the stent was implanted in the arterial coronary bypass graft. Forty-seven (47) stents (36%) were implanted withour previous PTCA. Mean arterial diameter was 3.2 ± 0.3 mm. Mean length of stenosis was 16.7 ± 4.3 mm. In 55 (42%) cases the arterial diameter was below 3 mm. Stenosis morphology was A - B1 in 38 cases (29%), B2 - C in 93 cases (71%). A total of 47 Biodivysio SV stents (36%), 39 Biodivysio AS stents (30%), and 45 Biodivysio OC stents (34%) were implanted. Angiographic success of stenting was achieved in all the 123 patients. There were no serious adverse events, all patients had uneventful recovery.

Long-term follow up at 8 ± 2.3 months was completed in 89 patients (101 stents), thus accounting for over 75% of the initial patient number. Grade 1-2 angina was found in 10 patients (11%), grade 3 angina - in 1 patient (1.1%). In 8 cases the history of angina was due to in-stent restenosis, in the remaining 3 cases - due to incomplete coronary revascularization. Follow-up coronary angiography revealed in-stent restenosis in 18 cases (17.9%), occlusion in 1 case, when the stent was implanted at the site of chronic occlusion in the distal third of LAD. All the patients underwent PTCA for the in-stent restenosis with good angiographic results.

In conclusion, the use of Biodivysio stent showed good immediate and mid-term results with restenosis rate of 18,9%.

RESULTS OF PERCUTANEOUS CORONARY INTERVENTIONS PERFORMED IMMEDIATELY AFTER CORONARY ANGIOGRAPHY

V.I.Ganiukov, A.A. Shilov, N.I. Sussoev, I.N. Shigantzov, E.A. Levchenko, I.Yu. Bravve, M.V. Demina, R.S. Tarassov (Novosibirsk)

Purpose of the study: to assess the immediate and long-term results of percutaneous coronary interventions (PCI) performed after coronary angiography.

Methods: we analyzed the results of 74 coronary angioplasty procedures performed between 2000 and 2003. The mean age of patients was 54 ± 10.32 years, there were 55 men (74%). Unstable angina was observed in 40 patients (54%), grade 1-3 stable angina - in 32 patients (43.2%), in 2 patients (2.8%) the PCI was performed during the acute stage of myocardial infarction. Mean ejection fraction was 58.94 ± 8.72%. In 20 patients (27%) PCI was performed in 2 or more coronary arteries. Baseline stenosis degree was 84.72 ± 13.1%.

Results: immediate angiographic success was achieved in 66 patients (89.2%). One patient died during PCI (1.35%), in the remaining 7 patients (9.45%) poor effect was associated with failure to repair coronary artery occlusion. Long-term results were assessed in 32 patients. Mean follow-up was 6,7 ± 3,7 months. Long-term clinical improvement (absence or reduction of angina functional class, negative stress test results) was achieved in 22 patients (68.8%). In 10 patients (31.2%) the angina recurred or progressed. Repeated intervention was performed in 7 patients (12.1%). Of these, 4 patients underwent repeated coronary bypass grafting.

Conclusions: Analysis of immediate and long-term results of PCI performed after coronary angiography suggested, that this intervention was effective and its results comparable to those of delayed PCI.

INFLUENCE OF PTCA ON REGIONAL SYSTOLIC AND DIASTOLIC LV FUNCTION IN PATIENTS WITH CAD

M.G. Shakhova, D.V. Krinochkin, V.A. Kuznetzov, I.P. Zyrianov, M.V. Semukhin (Tiumen)

Purpose of the study was to assess the pulse wave tissue Doppler parameters of regional systolic and diastolic left ventricular (LV) function in patients with CAD, who underwent percutaneous transluminal balloon coronary angioplasty (PTCA).

Pulse wave tissue Doppler study was performed in 92 patients (85 men and 7 women, mean age 51.3 ± 0.8 years) with coronary artery stenosis prior and 2 days following PTCA. We assessed the following parameters of the 16 LV myocardium segments: peak systolic velocity (S), early diastolic velocity (E), late diastolic velocity (A) and E/A ration. A total of 1300 LV segments were assessed. Depending on the stenosis degree all patients were divided between the three groups: 75% (A), > 75% (B) and occlusion (group C).

The increase of the parameters at day 2 postoperatively was detected in all patient groups, however, this was statistically significant only in group B. In addition, significant difference between values of E and E/A ratio ($p<0.001$ and $p=0.001$, respectively) prior to PTCA and between S, E, and A values ($p=0.02$, $p=0.01$ and $p<0.001$, respectively) following PTCA were observed.

Therefore, values characterizing systolic and diastolic LV function increased in the early postoperative period after PTCA. Detection of these changes can be used as an additional method to assess the results of PTCA.

CHRONIC HEART FAILURE AND THE STATE OF THE LEFT VENTRICLE IN PATIENTS WITH CAD

G.V.Kolunin, I.P. Zyrianov, V.A. Kuznetzov, B M.V. Semukhin, A.V. Panin, V.A. Bukhvalov, D.V. Krinochkin (Tiumen)

Purpose of the study was to assess the influence of PTCA on CHF manifestations and the condition of LV in CAD patients after PTCA as compared to medical therapy. The study enrolled 236 patients with CAD confirmed by angiography, who underwent repeated coronary angiography for angina recurrence or progression, including 89 patients without restenosis after PTCA (group 1), 58 patients with restenosis (group 2) and 89 patients, who received medical therapy only (group 3). Time intervals between the first and the second coronary angiography procedures were 15±1.5 months, 17±2.4 months, 24±2.2 months, respectively. Angiographic success was achieved in 142 (96.4%) of 147 patients after PTCA. Before the intervention 80.4% of patients had grade 3-4 angina. The angina disappeared in 89.6% and substantially regressed in 8.5% of patients. Significant progression of CHF functional class (NYHA) was found in group 3. Thus, the number of patients with grade 1 angina decreased from 47.7 to 27.1%, whereas the number of patients with grade 3 angina increased from 11.6 to 22.4% (p=0,001). Echocardiography showed significant increase of LV diameter from 51.1±0.45 mm to 52.5±0.53 mm, p=0.017; LV asynergy increased from 17.7±1.66% to 22.7±1.96%, p=0.009; LV ejection fraction decreased from 54.5±0.91% to 50.8±1.07%, p=0,001. In group 1 patients there were no CHF progression and no increase in LV asynergy and diameter, while the LV ejection fraction increased from 53.8±0.86% to 558±0.75%, p=0.014. In group 2 there was a trend towards CHF progression (p=0.086) and decrease of LV ejection fraction (p=0.052).

Therefore, CAD patients with angina recurrence or progression in the long-term period after PTCA without restenosis were characterized by the absence of CHF progression and improvement of LV function. Restenosis was associated with a trend towards CHF progression and decreased LV function. And, finally, medical therapy of CAD demonstrated significant negative changes in both clinical signs of CHF, global and local LV function.

CARDIAC RHYTHM DISTURBANCES IN THE FIRST DAY AFTER PTCA AND CORONARY STENTING

E.A. Bekchiu, I.G. Gordeev, V.A. Lussov, N.A. Volov, E.E. Ilyina, A.Yu. Lebedeva (Moscow)

Purpose: to assess the frequency and the type of rhythm disorders occurring within the first day after PTCA and stenting of coronary arteries.

Methods: we assessed 40 patients with stable angina (age 35 to 65 years), who underwent Holter ECG monitoring 10-12 days

prior to PTCA with stenting. Of these we selected 20 patients of similar sex, age, type of rhythm disorders on Holter ECG. There were 2 groups of 10 subjects each. The number of patients with single- and multi-vessel disease was equal. Group I received standard medical therapy for CAD, group II additionally received oral trimethazidine (preduktal MV) 70 mg daily. All patients underwent Holter ECG monitoring within the first day after PTCA and stenting to assess reperfusion rhythm disorders.

Results: four (4) patients in group I had paroxysms of unstable supraventricular tachycardia, 1 patient had a paroxysm of atrial fibrillation with ventricular extrasystoles 21.5±3.02 ($p>0.05$), 5 patients had bigeminal and trigeminal ventricular extrasystoles; 1 patient in group II had a paroxysm of unstable supraventricular tachycardia, there were 14.6±2.3 ventricular extrasystoles ($p<0,05$).

Conclusions: follow-up examinations demonstrated, that patients receiving trimethazidine have a trend towards the decrease of ventricular rhythm disorders, paroxysms of unstable supraventricular tachycardia, paroxysms of atrial fibrillation as compared to patients on standard therapy.

CHANGES OF THE INDICES OF LEFT VENTRICULAR MYOCARDIAL CONTRACTILITY IN PATIENTS WITH CAD AFTER PTCA

I.G. Gordeev, V.A. Lussov, E.A. Bekchiu, E.E. Ilyina, A.Yu. Lebedeva, N.A. Volov (Moscow)

Purpose: to assess changes of global and local contractile function of myocardium in patients with stable angina prior and following PTCA with stenting accompanied by trimethazidine (preduktal MV) 70 mg daily.

Methods: the patients were assigned to 2 groups of 10 subjects each (age ranged from 35 to 65 years). The number of patients with single- and two-vessel disease was equal between groups. Group I received standard therapy for CAD, group II additionally received trimethazidine 10-14 days prior to PTCA with coronary stenting.

All patients underwent three echocardiography studies: at baseline, during therapy and 8-10 days after PTCA with coronary stenting. The following parameters were evaluated: ejection fraction (EF) and index of left ventricular local contraction disorders (LVCD).

Results: baseline EF was 49.6%±2.56 in group I and 51.6%±3.24 in group II. During therapy EF was 54.8%±2.85 in group I vs 58.4%±2.5 in group II. Following PTCA with coronary stenting the EF value was 58%±3.4 in group I vs 61.2%±2.67 in group II. Baseline LVCD was 1.4±0.09 in group I vs 1.3±0.1 in group II, during therapy this value was 1.3±0.04 ($p<0.05$) in group I compared to 1.15±0.03 ($p<0.05$) in group II, LVCD after PTCA with stenting was 1.17±0.02 ($p<0.05$) in group I vs 1.06±0.02 ($p<0.05$) in group II.

Conclusions: trimethazidine 70 mg daily tended to decrease the index of local contraction disorders and LV systolic dysfunction. Thus, the addition of trimethazidine to standard therapy for CAD results in restoration of heart pumping capacity and decrease of LV dysfunction.

WHAT INFLUENCES THE PROBABILITY OF ESOPHAGUS PERFORATION DURING BALLOON ESOPHAGOPLASTY?

A.A. Maltzev, A.N. Maltzev (Ulianovsk)

Purpose: to elucidate the causes of esophagus perforation during balloon esophagoplasty. To define radiological criteria of patient selection for balloon esophagoplasty considering the predictors of success and complications of the procedure.

Patients and methods: between 1996 and 2003 a total of 125 balloon esophagoplasty procedures were performed to 56 patients. The age of patients was 2 to 77 years (mean age 47.43±15.58). Indications for surgery were cicatrical stricture in 43 patients and esophageal achalasia in 15. The time after esophageal injury was over 1 month in all cases. Besides the measurement of residual diameter at the site of stenosis, the "firability" and edema of esophageal mucosa were assessed during esophagoscopy. Mean diameter at stricture site prior to dilation was 7.9±3.7 mm, mean length of stricture - 38.17±17.3 mm. In 4 patients dysphagia was classified as 1 point, in 10 patients - 2 points, in 37 patients - 3 points, in 7 patients - 4 points (Bown scale).

Thirty-two (32) patients underwent single procedure, 4 patients had two-stage esophageal dilation. Three-stage procedure was performed in two patients. One patient had a four-stage procedure. Completion fluoroscopy with opaque meal was performed intraoperatively and 4-7 days after the procedure.

Results: all patients were divided between 3 groups according to the results:

1. Patients, who underwent balloon angioplasty with satisfactory clinical, radiological and endoscopic outcome during 1 to 8 years of follow-up;
2. Patients, who required repeated intervention for recurrent cicatrical stricture within the same follow-up interval;
3. Patients with iatrogenic esophageal perforation.

The first group included 32 patients (99 procedures). Mean esophageal diameter after dilation (as measured during esophagoscopy and esophagography) was 18.0±1.5 mm compared to 9.2±3.7 mm before surgery. The length of stricture was 26.2±2.7 mm.

The second group included 19 patients. This group was characterized by longer strictures (48.4±2.1 mm) and lower baseline esophageal diameter at the site of stenting (5.1±3.4 mm).

In seven cases the procedure was complicated by esophageal perforation resulting from the attempt to advance the guidewire, which required emergency thoracotomy. No death occurred.

In patients with iatrogenic esophageal perforation the esophageal diameter at the site of stenosis was ≤3.5 mm. As measured by esophagoscopy, 5 patients had moderated edema of esophageal mucosa, 6 patients had "friable" mucosa with increased contact bleeding. No significant correlation between the rate of iatrogenic perforation and the length of stricture was revealed. Of the 7 patients, 6 underwent repeated interventions.

Conclusions:

1. Cases in the study is iatrogenic esophageal perforation, occurring in 5.6% of the most serious complication of balloon esophagoplasty.
2. Esophageal diameter at the site of stenosis and changes of mucosa are crucial for patient selection for this intervention in respect to the risk of iatrogenic esophageal perforation.
3. Esophagoscopy is useful in candidates for balloon esophagoplasty, for it ensured both measurement of residual diameter and changes of mucosa.

TEMPORARY STENT (CLINICAL AND EXPERIMENTAL STUDY)

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P.Dundua, A.M. Babunashvili (Moscow)

Purpose of the study: to assess the possibility, efficacy and safety of using temporary stent in clinical practice.

Methods: 20 patients underwent implantation and removal of a temporary ZA-stent. The temporary stent is a modification of ZA-stent with additional elements on the distal edge facilitating its removal. In 20 patients with lesions of the iliac arteries a total of 20 temporary stents were implanted after prior balloon angioplasty. The stents were removed via percutaneous approach 7 days after the intervention.

Results: there were no complications of stent implantation and removal in all cases. Minimal arterial diameter at the site of stenosis increased from 2.3 to 7.8 mm. We didn't found stent breakage, dislocation or damage, as well as thrombosis of the artery was found. In two cases intimal dissection was found distally or proximally to the stent.

Long-term follow-up angiography showed the minimal arterial diameter after stent removal to be on average 7.8 mm without any significant reduction at 6 months. The 12-months follow-up revealed no cases of restenosis or thrombosis. There were no repeated revascularization procedures. Ankle-brachial index significantly increased postoperatively from 0.5 to 1.0 (mean value at 6 and 12 months follow-up was 0.9). Clinical success was achieved in all cases. In 15 out of 20 patients there were no signs of claudication after the intervention.

Five (5) patients with bilateral stenoses of the iliac arteries underwent stenting with a temporary stent (on one side) and permanent ZA-stent (on the other side). Follow-up angiography at 6 months revealed no significant difference in minimal arterial diameters at the sites of temporary and permanent stents within the group.

Conclusion: the use of temporary stents in clinical practice is safe and effective. The most prospective trend with the temporary stents could be their use as drug vectors.

TEMPORARY VENOUS FILTERS

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P.Dundua, A.M. Babunashvili (Moscow)

Purpose of the study: to design an effective and simple in use temporary cava-filter.

Methods: a total of 17 nitinol filters were implanted to 13 pigs in infrarenal and suprarenal vena cava.

In 7 cases femoral approach was used to implant and remove the filter, jugular approach was used in 6 cases. The filters were successfully removed without technical complexity using 7F system 1, 2 and 7 days postoperatively. No cases of thrombosis, migration or deformation of the cava-filter were encountered.

Vena cava angiography performed immediately after the removal of the cava-filter revealed no signs of injury to vena cava.

Conclusion: temporary nitinol cava-filter can be safely implanted to and removed from the vena cava.

COMPARISON OF ANGIOGRAPHIC AND INTRAVASCULAR METHODS FOR THE DETERMINATION OF HEMODYNAMIC SIGNIFICANCE OF CORONARY STENOSES

V.V. Chestukhin, B.L. Mironkov, I.G. Riadovoy, A.S. Inozemtzev, A.B. Mironkov (Moscow)

We believe that the angiographic stenosis degree of 70%, which is considered an indication to revascularization, is not fully objective, for it doesn't take into account the arterial diameter and hence the residual lumen area. Volumetric blood flow is known to depend on the cross-sectional area and the pressure.

The cross-sectional area of a 5 mm artery with 70% stenosis is approximately 6 mm^2 compared to as small as $\approx$2.1 mm^2 in a 3 mm artery which is almost 3 times smaller. Therefore, the blood flow can vary several fold between arteries of different diameter with similar per cent of stenosis; this fact is important for determination of whether revascularization is useful or not.

The degree of stenosis as measured by intravascular ultrasonography (IVUS) is known to be lower than that measured by coronary angiography. Therefore, IVUS is more preferable to define indications for revascularization in disputable cases. However, this problem needs additional consideration using methods designed to determine the hemodynamic significance of stenosis (intravascular manometry, rapid atrial pacing).

Objective assessment of hemodynamic significance of the coronary artery stenosis is particularly important for low-grade stenosis accompanied by diffuse changes of peripheral vascular bed or by angiospasm, which can aggravate the signs of CAD or ECG findings of ischemia or even are the leading cause of symptoms.

RESULTS OF EXPERIMENTAL DEVELOPMENT OF A STENT WITH CYTOSTATIC DRUG - CONTAINING POLYMER COATING

T.G. Volova, L.S.Kokov, A.V. Protopopov, E.P.Konstantinov, E.I. Shishatzkaya, T.A. Kochkina, A.N.Balan (Moscow)

Purpose: to design an experimental model of stent with modified polymeric surface containing cytostatic agent.

Materials and methods: we performed a series of animal experiments with domestic type of self-expanding nitinol stent (KOMED, Russia) to assess the tissue response to implantation of a stent covered with polyoxyalkanoate (POA) containing cytostatic agent. Each series included experimental implantation of stent in 9 mongrel dogs (weight 10-17 kg) with subsequent detection of vessel wall response at 2 weeks, 1 and 3 months postoperatively. Three animals were sacrificed for each time pint.

In addition to qualitative characteristics (thrombosis, intimal hyperplasia, fibroblast hyperplasia) the following parameters were assessed at each time point: the number of leukocytes at the sites of contact between intima and stent, the number of fibroblasts, intimal thickness, internal elastic lamina (IEL) thickness, the number of vessels in intima. Values obtained for histological response to implantation of non-covered metal stent were considered as the control values.

Results: basic control characteristics of tissue response to implantation of polymer-coated stent, including that with cytostatic agent, suggested substantial decrease of inflammatory reactions within the vessel wall resulting in lower intimal hyperplasia at the main time points.

Conclusions: modification of stent surface using polymeric coating and the addition of a cytostatic agent have favorable effect on the patency rate at the site of stenting in experimental settings.

RESTORATION OF PERMEABILITY OF THE OCCLUDED DIALYSIS SHUNTS AND FISTULAE USING ENDOVASCULAR METHODS

V.V. Demin, V.V. Zelenin, A.A. Seliutin (Orenburg)

Endovascular recanalization of hemodialysis bypass grafts and fistulas was attempted 15 times in 12 patients: 13 recanalizations of arteriovenous fistulas and 2 recanalizations of arteriovenous bypass grafts. Successful repair of hemodialysis approach was achieved in 11 cases (73.3 %). The patency of occluded fistula was restored in 7 patients. Mean age of patients with effective endovascular interventions was 37 years. Thrombosis duration was 3 to 20 days (mean value 6.5 ± 2.3 days). Among patients with ineffective recanalization the mean patency time was 31.5 months compared to 7 months in patients with successful interventions. Elective repeated interventions were performed in two fistulas with high-grade stenosis. Arteriovenous bypass was repaired two times in a single female patient.

Therefore, the time after fistula construction is an important predictor of successful reconstruction. Antegrade brachial approach was used for endovascular interventions in all cases but one. Retrograde femoral approach was used in one patient. Antegrade femoral approach was used to restore patency of femoral arteriovenous bypass graft. Recanalization was conducted with hydrophilic guidewires and small-caliber coronary catheters with subsequent balloon angioplasty of the stenosis.

Thrombus was removed by rheolytic thrombectomy with AngioJet unit (Possis Med.): twice from arteriovenous bypass and 4 times from venous portion of the fistula. In 3 patients the intervention was accompanied by implantation of 4 stents. Two patients

underwent stenting of venous portion of the fistula. Two stents were implanted into arterial and venous anastomoses of femoral arteriovenous bypass in one female patient.

After endovascular angioplasty without stenting the femoral bypass was patent at 3.5 months compared with 8.5 months after X-ray surgical-intervention with stenting of anastomoses. Total time of bypass use in this female patient was 18 months.

Therefore, roentgenendovascular intervention is a highly effective and minimally invasive method of quick restoration of patency of hemodialysis approach, thus ensuring its preservation, increasing its life time and avoiding the unnecessary placement of a new arteriovenous bypass graft or fistula in another vascular segment.

ROENTGENO-VIDEO-DENSITOMETRY IN THE STUDY OF HEMODYNAMICS AND PERFUSION IN THE SYSTEM OF BRACHIOCEPHALIC AND INTRACEREBRAL VESSELS

Yu.D. Volynsky, A.V. Gavrilov (Moscow)

Purpose of the study: to assess the potential of roentgeno-video-densitometry for quantitative assessment of flow dynamics in different brachiocephalic and cerebral arteries with simultaneous measurement of tissue perfusion.

Materials and methods: X-ray contrast images obtained in video mode during selective angiography of brachiocephalic arteries in patients with various brain diseases, injuries of cervical spine and atherosclerosis were recorded in Dicom 3 standard and entered into MultiVox 2D workstation.

After the subtraction procedure "windows of interest" were selected in the target areas of X-ray contrast image and the changes of grey-scale brightness (density) were measured. The resulting curves reflected the dynamics of contrast medium flow through the target site, which correlated with the volumetric blood velocity.

Results:

1. Roentgeno-video-densitometry curves obtained at 12 - 25 images per sec reflected the dynamics of blood flow in the vessels studied, including imaging of flow pulse. X-ray cinematography at lower picture frequency reflected the generalized features of flow dynamics and brain perfusion.
2. Comparison of amplitude and time between simultaneously recorded curves ensured objective comparison of velocity and intensity of flow in various arterial and venous vessels, thus demonstrating occlusion, shunting or local perfusion disorders.
3. Comparison of roentgeno-video-densitometry curves recorded from various arteries with the curve detected in the corresponding brain region ensures objective assessment of the contribution of each vessel into local or regional circulation.
4. Measurement of brightness (density) of cross-sectional X-ray contrast images of the vessel reveals large and medium plaques protruding into the lumen, even if the vessel contour is normal.
5. By measuring the time between curves at two successive levels of the same vessel one can determine the volumetric blood velocity in the vessel.

Conclusion: the designed method of roentgeno-video-densitometry ensures simultaneous measurement of basic flow parameters in the selected vessels and in the corresponding regions of brain, and (in adequate projection) in the spinal cord on the basis of a single series of angiographic images obtained at sufficiently high picture frequency.

USE OF A NEW TYPE OF DETACHABLE COILS FOR THE EMBOLIZATION OF PATENT DUCTUS ARTERIOSUS

G.V. Kozlov, B.M. Shukurov, A.P. Dushkina, N.A. Chigogidze (Volgograd)

Purpose of the study - to assess the efficacy of new type of coils for endovascular therapy in patients with patent ductus arteriosus.

Since 1997 we have performed embolization in 30 patients with patent ductus arteriosus (PDA) using detachable coils desinged in the Bakoulev Center for Cardiovascular Surgery of the Russian Academy of Medical Sciences. A total of 30 patients aged 1 to 17 years underwent embolization of PDA; there were 19 women.

Preoperative examination revealed characteristic clinical features of PDA in all patients.

Doppler echocardiography with measurement of blood shunting from aorta to pulmonary artery was the main method used for diagnostic purposes and to define the indications to surgery. In 6 patients we used magnetic resonance imaging for precise determination of the anatomy of the disease. Systolic pressure in the pulmonary artery during catheterization was 15 to 60 mm Hg (mean value 42 ± 16 mm HG). Left-to-right shunting was 30 ± 13%. Aortography showed PDA 2 to 5 mm in diameter. In 26 patients there was a type A PDA with well-marked aortic ampulla, 4 patients had type B PDA (short duct with the narrowest aortic portion). PDA embolization was performed according to standard procedure.

Embolization was successful in all 30 cases, a total of 31 coils were implanted. In one female patient 2 coils were used. No complications or coil dislocations were observed. Immediate complete occlusion of PDA was shown in 19 patients, occlusion within 15-30 min following the intervention was demonstrated in 8 patients, within 18 h - in 1 patient and within 21 h - in 2 patients.

Follow-up ultrasound study performed 18-34 h following coil implantation showed good anchorage of coils and no signs of blood shunting. Twenty-three (23) patients were available for examination at 1 - 2.5 years. Follow-up ultrasound and radiological studies revealed stable anchorage of coils at the site of implantation with no signs of blood shunting.

Conclusion: a new type of detachable coils proved to be highly effective and safe for the management of PDA.

USE OF A NEW TYPE OF DETACHABLE COILS IN ENDOVASCULAR SURGERY OF BRACHIOCEPHALIC AND CORONARY ARTERIES

B.M. Shukurov, G.V. Kozlov, N.A. Chigogidze (Volgograd)

Purpose of the study - to assess the efficacy of new type of coils for endovascular embolization of arteriovenous fistulas (AVF) in coronary and brachiocephalic territories. A total of 14 embolization procedures were performed for AVF of brachiocephalic arteries in 8 patients (5 men and 3 women) and endovascular embolization for coronary-cardiac fistulas with detachable coils designed in the Bakoulev Center for Cardiovascular Surgery of the Russian Academy of Medical Sciences - in 2 patients. The age of patients was 6 to 51 years.

Of the 8 patients with CAD who underwent embolization, 2 had carotid-cavernous fistula, another 2 - mixed soft tissue hemangioma in the occipital and temporal regions. In 2 patients we found AVF between the truncus thyrocervicalis and the external jugular vein. In one patient the embolization was performed for acute erosive bleeding from the external carotid artery (ECA) vasculature following the removal of hemangioma. In another patient embolization was performed for traumatic recurring nasal bleeding. Two patients underwent embolization of coronary fistulas (between the circumflex artery and the right ventricle in one case, and between the circumflex artery and the right atrium in another).

Therefore, embolization was performed for a wide range of anatomical and etiological aspects of the disease.

The number of stents per vascular segment was 1 to 6, whereas stent diameter was 5-12 mm. There were no dislocation and migration of coils during or following endovascular procedures. Embolization was effective in all patients, the desired goals were achieved. No long-term complications were observed.

Conclusion: the use of novel detachable coils in endovascular surgery of carotid and coronary arteries proved to be highly effective and safe. The designed type of detachable coils can be successfully used in various arterial territories.

IMMEDIATE AND LONG-TERM RESULTS OF THE USE OF "EPHESOS" STENT FOR THE TREATMENT OF CORONARY ARTERY DISEASE

F.D. Arful, E.V. Merkulov, A.V. Sozykin, I.V. Levitzky, V.P. Lupanov, T.A. Batyraliev, A.N.Samko (Moscow, Voronej)

Purpose of the study was to assess the immediate and long-term results of the use of "EPHESOS" (Nemed, Turkey) stent. For the period of 12 months a total of 50 stents were implanted in 50 patients with coronary atherosclerosis (coronary artery disease with angina functional class (FC)II-IV ,mean age - 54±6 years). The results were favorable in all cases. Minimum vessel diameter prior to stenting was 0.9 mm, mean length of stenosis was 12 ± 4 mm, mean stent expansion pressure was 8 atmospheres, stent diameter was 3.5 mm in 12 patients and 3.0 mm - in 36 patients. In one patient the stent was expanded incompletely, therefore, higher pressure balloon was used. Initial stenosis degree was 85 ± 2,3% vs 2 ± 3%

postoperatively. All patients received heparin 10,000 IU intracoronarly (i.c.), followed by intravenous (i.v.) infusion of 1,000 IU per hour, plavix 75 mg daily within 6 months following stenting, aspirin 125 mg daily. Six months postoperatively angina recurred in 10 patients (13.7%) with in-stent restenosis >50%.

Conclusion: therefore, intracoronary "EPHESOS" stent proved to be effective for the treatment of native coronary stenosis.

THE EVALUATION OF THE TREATMENT EFFICACY OF DE-NOVO CORONARY LESIONS BY PTCA WITH IMPLANTATION OF THE FIRST POLISH STENT "CHOPIN"

P. Buszman, A. Zurakovski, L. Kinasz, B.Garycki, M. Krol, A. Lewicki (Katowice, Poland)

Background: the aim of the study was to assess the efficacy and safety of the PTCA procedures using coronary stents "Chopin" produced by Balton company. The treatment group consist of 101 patients (57% males, mean age 55,6±10 years) with CAD (unstable angina 12%, acute myocardial infarction 19%). The risk factors were as follows: diabetes (18,2%), smoking (50,9%), hypercholesterolemia (75,4%) and family history of CAD (61,7%). The inclusion criteria were de novo significant stenosis (>50% diameter stenosis) in native arteries eligible for PTCA procedure with stent implantation. The study protocol involved 6 month follow-up with assessment of the coronary syndromes and subsequent coronary angiography. The baseline and follow-up angiograms were evaluated by QCA to assess the early and late in-stent restenosis rate.

Results: 107 stents were used and 106 stents were successfully deployed in105 coronary arteries. The mean sizes of used stents were diameter 3,2±0,3 and length 15,2±2 mm. In one month follow-up there were no acute/subacute in-stent thrombosis episodes and no target lesion revascularization was performed. No acute coronary syndromes were registered. In 6 month follow-up there were no deaths and acute infarction. The repeated PTCA were performed in 15 patients because of symptoms of recurrent angina and restenosis in the treated vessels (target vessel revascularization - 15,5%). Coronary angiography was performed in 97 (96%) patients and 101 treated segments were evaluated. The in-stent restenosis (>50% diameter stenosis) were found in 18,8% of cases. The mean late lumen loss was 0,77±0,6 mm and mean stenosis was 29,1±20%.

Conclusions: polish stent "Chopin" is an effective vascular procedure for successful coronary angioplasty.

«Miscellaneous - 3»

CYTOFLUOROMETRIC ANALYSIS OF THE ATHEROSCLEROTIC PLAQUES MATERIAL, OBTAINED DURING DIRECTIONAL ATHERECTOMY

S.I. Provatorov, A.N. Samko, T.I. Arefieva, N.B. Kukhtina, T.L. Krasnikova, A.V. Sozykin, I.V. Levitzky (Moscow)

The objective of the study was to determine the subpopulation composition of lymphocytes in atherosclerotic plaques extracted from patients with different forms of coronary artery disease (CAD) by flow cytofluorometry.

The study included 7 patients with stable exertional angina functional class (FC) II-III, and 6 patients with acute coronary syndrome (ACS) assigned for directional coronary atherectomy. The mean age of patients was 54.6±8.7 years, the severity of stenosis was 74.6±14.3%, the predicted diameter of the target artery was 3.21±0.38 mm. Intervention was successful in all patients. The material obtained during the procedure was dispersed by collagenase treatment and was stained with fluorescent marked monoclonal antibodies: lin1, CD3, CD4, CD8, CD19, CD11c, (Becton Dickinson, USA); it was stained also with chemokine receptors antibodies CXCR3, CCR2 (R&D Systems, USA) for subsequent analysis in FacsCalibur flow cytometer (Becton Dickinson, USA).

Leucocytes were isolated by lin antigen expression. No significant amounts of leucocytes were observed in the samples from patients with stable angina. Each sample from patients with acute coronary syndrome (ACS) contained a significant amount of leucocytes. Macrophages were detected by expression of CD 11C. Lymphocyte/macrophage ratio varied from 1:1 to 9:1. the absolute majority of lymphocytes were T-cells. T-helpers (CD4+) constituted 50-80% of T-cells. 36-66% of CD4+ lymphocytes expressed CCR2, while CXCR3 expression was observed on all lymphocytes in this population.

Conclusion: in patients with acute coronary syndrome (ACS) the atherosclerotic plaques are infiltrated with mononuclear cells (monocytes and T-lymphocytes, particularly T-helpers). CXCR3 coexpression on these cells indicates the development of Th1-type local inflammatory process.

ASSESSMENT OF THE INFLUENCE OF THE PRODUCTS OF ULTRASONIC ATHEROSCLEROTIC PLAQUES DESTRUCTION ON THE STATE OF HOMEOSTATIC SYSTEM IN VIVO

A.G. Mrochek, V.I.Stelmashok, M.M. Goncharuk, Tui Zian (Minsk, Belarus)

Objectives: to evaluate the influence of the particles generated during ultrasonic angioplasty on the state of platelet hemostasis and coagulation hemostasis.

Materials and methods: coronary arteries occluded by calcified plaques (CP) were obtained at autopsy, and underwent intravascular ultrasound procedures (frequency was 28 kHz, intensity was 2.20-043.0 W/cmI). After recanalization the intima of the vessel was washed with 0.9% saline. The effluent obtained was collected (V=5 ml) and then was introduced into the lumen of the dog femoral artery (n=7, experimental group). The control animals (n=7) underwent the intraarterial injection of adequate quantity of 0.9% saline. Blood sampling was performed three times in either group (initial, at 0.5 hours, and at 24 hours following effluent injection). ADF-induced platelet aggregation and coagulation hemostasis indices were studied. In 7 cases the effluent was collected on the filters, which were examined by scanning electron microscopy.

Results: the particles generated were rounded or oval shaped with advanced surface geometry. The linear dimensions of 80.6% of fragments did not exceed 8μm. The reduction of the magnitude of platelet aggregation and acceleration of platelet aggregation were observed in the experimental group compared to the control group ($p<0.05$) at 0.5 hours following intraarterial injection of the particles. However, the aggregation ability was restored to the initial level within 24 hours. No specific changes of coagulation hemostasis were observed.

Conclusion: no susceptibility for development of thrombophilic state or disseminated intravascular coagulation (DIC) was observed in the immediate period of circulation of CP fragments generated during ultrasonic angioplasty.

CLINICAL AND ANGIOGRAPHIC RESULTS OF DIRECT MYOCARDIAL REVASCULARIZATION IN PATIENTS WITH CAD IN MID-TERM FOLLOW-UP AFTER SURGERY

Z.R. Ovessian, I.V. Issaeva, S.A. Tzyguelnikov, J.Ch. Vernet, S.P Yarkov, A.V. Arablinsky, D.G.Iosseliani (Moscow, Bordeaux)

Purposes of the study: to study the clinical outcomes in patients with CAD in mid-term follow-up after surgical myocardial revascularization.

Materials and methods: the study included 106 CAD patients (95 males) after myocardial revascularization surgery who underwent repeated examination on average at 7.2±0.8 months follow-up. Mean age was 56.9±years. By the moment of coronary bypass grafting 82 (77.3%) patients had exertional angina functional class (FC) III-IV (according to Canadian classification), 18 (17%) patients had unstable angina, and 6 (5.7%) patients had acute myocardial infarction (AMI). Thirty five (33%) patients had lesion of the left main coronary artery, 67 (75.2%) patients had three-vessel lesion, and 22 (24.8%) patients had two-vessel lesion. Two hundred and forty grafts were implanted (137 aortocoronary grafts, 103 mammary coronary grafts; 13 Y-grafts, 172 straight grafts, and 55 sequential grafts, respectively). Complete revascularization was performed in 57.5% of cases.

Results: in mid-term follow-up the clinical improvement was observed in 90 (84.9%) patients. Eighty (84.9%) patients had no symptoms of angina; angina functional class improved by 2 classes in 15 (14.2%) patients. The clinical effectiveness of complete revascularization was observed in 95.1% of cases. Acute myocardial infarction was observed in 1.9 % of cases, 6 (5.7%) patients developed recurrent angina FC III-IV. Bicycle exercise test was negative in 63.2% of patients. Exercise tolerance significantly increased from 66,3±2,9 Wt to 96.1±2.8 Wt ($p< 0.05$). Beta-blockers consumption decreased significantly from 92% to 80%, and nitrate consumption significantly decreased from 97% to 12%, respectively. Shuntography showed that 290 (92.9%) grafts remained patent. Among these patent grafts, 284 were in good state, and 6 were in satisfactory state (luminal narrowing of the distal anastomoses <50%). Graft patency loss was observed in 22 bypass grafts: 12 grafts were occluded, 10 grafts had hemodynamically significant stenoses. The number of venous graft lesions was 13 (11.9%), the number of arterial graft lesions - 9 (4.4%), respectively.

Conclusions: in mid-term follow-up after CABG the large majority of patients present with clinical improvement, absence of angina symptoms as judged by stress-test and Holter ECG monitoring, the increase of physical tolerance. Total revascularization resulted in higher clinical effectiveness. The large majority of grafts remain patent in mid-term follow-up after direct myocardial revascularization. Autoarterial grafts show better patency rate than the venous ones.

FIRST EXPERIENCE WITH CORONARY STENTING IN PATIENTS WITH CHRONIC CAD IN STAVROPOL REGION

Yu.E. Voskanian, O.G. Kuznetzov, V.N. Kolesnikov, I.V. Faians, N.A. Sletkov, O.A. Samko, O.V. Bulda, A.V. Kuprianova, A.L. Khodus, L.V. Loskutova (Stavropol)

Objectives: to analyse the immediate results of coronary stenting in patients with CAD.

Material and methods: from November 2003 until October 2004 138 patients with chronic CAD were observed. Twenty eight patients underwent coronary artery stenting. Eight (28.6%)patients had angina functional class (FC) II, 17 (60.7%) patients had FC III, and 3 (10.7%) patients had FC IV, respectively. Fourteen (50.0%) patients had a history of acute myocardial infarction (AMI). Left ventricular ejection fraction (LV EF)varied from 49% to 65%. Coronary angiography revealed one-vessel lesion in 10 (35.8%) patients, two-vessel lesion - in 9 (32.1%), and three-vessel lesion - in 9 (32.1%) patients, respectively. Among concomitant diseases, essential hypertension was identified in 17 (60.7%) patients, diabetes mellitus - in 7 (25.0%) patients, respectively.

Most of the patients (35 patients; 70.0%)) underwent direct stenting. The number of stents implanted was the following: 1 stent was implanted in 14 (50.0%) patients, 2 stents - in 8 (28.6%) patients, 3 stents - in 4 (14.3%) patients, and 4 stents - in 2 (7.1%) patients, respectively. No complications were observed during stenting and in the early postoperative period. According to control coronary angiography data complete lumen restoration was achieved in 96% of cases.

No fatal outcomes were observed during surgery and in the immediate follow-up. No acute myocardial infarction (AMI) developed as well. Clinical improvement such as disappearance of angi-

na or improvement in angina functional class by at least 2 classes was observed in all patients. Ejection fraction (EF) increase from 3% to 8% within one week follow-up was registered in 15 (53.6%) patients.

Conclusion: coronary stenting for treatment of CAD gives immediate favourable clinical effect associated with minimal percentage of complications.

ENDOVASCULAR EMBOLIZATION OF MULTIPLE ARTERIO-VENOUS FISTULAE OF THE EXTREMITIES

D.D. Potzeluev, V.A. Djakupov, D.T.Mussagaliev, O.V. Gorgotz (Almaty, Republic of Kazakhstan)

Objectives: to improve the results of treatment in patients with multiple arterio-venous fistulae (AVF) of the limbs.

Materials and methods: from 1994 until 2004, 33 patients aged 7 to 31 years with multiple arterio-venous fistulae (AVF) of the limbs (42.6% of all patients with AVF of various locations) were examined and treated. Twenty one (63.64%) of them were females. Two or more anatomic areas of the limbs were affected in 23 (69.69%) cases, one anatomic area was affected in 6 (18.18%) cases, respectively.

Patients were examined by duplex scanning of main arteries, veins and AVF area; computed tomography (CT) was used as well. In a number of cases magnetic resonance imaging (MRI) was used.

Selective and superselective digital subtraction angiography was the primary method of diagnostics of arterio-venous fistulae (AVF); it was combined with the treatment procedure (endovascular embolization of AVF feeding arteries). The number of stages of in-hospital treatment varied from 2 to 7 depending on the extent of the vessel lesion.

Results of treatment: satisfactory results in patients with multiple arterio-venous fistulae of the limbs (disappearance of limb pain or decrease in pain intensity, reduction of pathologic arteriovenous shunt volume) were obtained in 30 (90.91%) patients. In 3 (9.09%) cases no improvement of regional hemodynamics was observed.

Conclusion: the study performed showed that the stepwise multiple superselective catheterization and embolization of multiple arterio-venous fistulae of the limbs allow to achieve satisfactory clinical outcomes in most patients.

DIRECT CORONARY STENTING IN PATIENTS WITH CAD: IMMEDIATE AND LONG-TERM RESULTS

I.E. Chernyshova (Moscow)

Objectives: to evaluate immediate and long-term results of "direct" stenting in patients with different forms of CAD.

Materials and methods: three hundred patients with different forms of CAD were examined. Patients were assigned in two groups as follows: the first group included 155 patients, who underwent direct implantation of 210 stents; the second group included 145 patients, who underwent 182 stentings following balloon dilation. By the moment of procedure performance most of patients had effort angina NYHA functional class I-IV. Mean age in the first group was 55.3±0.6 years, in the second group - 53.7±0.7 years, respectively. The vast majority of patients in both groups were males (130 (89.6%) and 118 (81.3%), respectively). Most patients had lesions of one or two coronary arteries: respectively 61 (39.3%) and 62 (40%) cases in the first group, and 57 (39.3%) and 64 (44.1%) cases in the second group. Stenoses of complicated morphology type B2/C (according to AHA/ACC classification) were observed in 39% of cases in the first group, and in 41% of cases in the second group, respectively.

Results: immediate angiographic success amounted up to 99% in the first group, and 100% in the second group, respectively. In-hospital complications rate was significantly lower in patients of the first group, compared to the second group - 3 (1.9%) and 11 (6%), respectively). Direct stenting allowed to reduce the dissection rate. After direct stenting in-hospital clinical course was without complications in 100% of patients, as well as in 96.1% of patients following stenting + PTCA. Analysis of the total time of direct stenting performance, fluoroscopy duration and contrast consumption demonstrated significant differences between direct stenting and stenting combined with PTCA in the total time of procedure (24.0±8.03 min (p=0.01472)); in contrast consumption - 110± 35 ml versus 238±55 ml, (p=0.0469).

In the long-term follow-up (on average at 6.7±0.1 months) 107 (70.0%) patients with 125 implanted stents and 108 (74.4%) patients with 113 implanted stents (in the first and the second groups respectively), underwent repeated examination including selective coronary angiography (CAG). Cardiac mortality rate was 0% in both groups. In the first group acute myocardial infarction developed in one case (0.6%), and in the second group - in two cases (1.3%). Coronary artery bypass grafting (CABG) was recommended to 4 (2.5%) patients of the first group, and to 4 (2.7%) patients of the second group. Most patients in both groups - 66 (62%) and 59 (54.6%), respectively, were free from angina. Stress-test results were negative in most patients of both groups (57 (62.0%) and 57 (60.0%), respectively). Restenosis rate was 20.8% in the first group, and 22.1% in the second group, respectively; reocclusion rate in the second group was 1.7%.

Conclusions: Coronary artery stenting without predilatation is an effective and safe method of treatment in properly selected patients with different forms of CAD. Direct stenting significantly reduces the total time of procedure performance, fluoroscopy duration and contrast consumption.

ANALYSIS OF THE LETHAL OUTCOMES IN ACUTE MYOCARDIAL INFARCTION IN THE LIGHT OF THE SEARCH OF THE WAYS FOR THE DECREASE OF MORTALITY

G.A. Nefedova (Moscow)

Multiple analysis of lethal outcomes from true cardiogenic shock (TCGS) and external heart rupture (EHR) demonstrates that these lethal complications of acute myocardial infarction (AMI) develop in different contingent of patients, so the perspectives of mortality reduction differ essentially as well.

As a rule, true cardiogenic shock complicates the extensive myocardial infarction. These patients are characterized by severe atherosclerotic stenoses of all coronary arteries, by multiple background and concomitant diseases, and by signs of heart failure. This contingent of extremely severe patients shows very little promise in view of current treatment possibilities, determining high mortality rate.

Twenty three percent of patients with true cardiogenic shock complicating the extensive myocardial infarction with localized lesion involving one of the coronary branches may have diverse prospects; (most of these patients are able-bodied men)/ Active use of current methods of interventional cardiology **prior to development of acute myocardial infarction, i.e. preventionally,** is the most effective way to reduce lethality rate in this contingent of patients.

External heart rupture as a rule complicates non-extensive AMI with localized stenosis of one coronary branch in patients with essential hypertension. It develops quite often during hypertensive syndrome. So the prospects of prevention of this complication depend on the treatment of the said syndrome.

EFFECT OF BRONCHIAL ARTERIES EMBOLIZATION ON THE COURSE OF INFLAMMATORY PROCESS, THE INDICES OF EXTERNAL BREATHING AND INTRACARDIAC HEMODYNAMICS

Yu.D. Volynsky (Moscow)

Objectives: to study the influence of bronchial arteries embolization undertaken to arrest lung bleeding on the functional state of the lungs and heart.

Material and methods: one hundred and seventeen patients with pulmonary and cardiac diseases underwent bronchial arteries embolization to arrest lung bleeding and hemoptysis. The following methods were used to study the results of intervention: echocardiography, simultaneous catheterization of left and right heart, dye dilution method, platinum-hydrogen dilution method, examination of external breathing, sputum cytology, bronchoscopy data, brash biopsy data, hystologic analysis of the extracted lungs and analysis of long-term results. Obtained data were processed with multivariate statistic methods.

Results: bronchial arteries embolization allowed to achieve clear hemostatic effect in 87% of cases. Elimination of significant pulmonary shunting resulted in decreased size of the left ventricle and increased size of the right ventricle; patients with increased pressure in the pulmonary artery presented its normalization. Patients with chronic nonspecific lung disease (CNLD) presented good and excellent indices of external breathing in 67% of cases. (Lung vital capacity increased, bronchial tree patency improved, the residual volume decreased). In 55% of cases the inflammatory process activity decreased, the amount of sputum decreased, and its cellular composition improved. The reduction of recurrence rate

was observed in the long-term follow-up.

Conclusion: bronchial arteries embolization is the effective method to arrest lung bleeding. It is effective while the other methods have exhausted all their potentialities, or are associated with high risk, or are impracticable for various reasons. Elimination of pathologic shunting promotes normalization of central hemodynamics and has the favourable influence on the course of inflammatory process in the lungs. Results of the study allow to recommend this procedure for the treatment of persistent chronic inflammatory process (particularly with asthmatic component) with poor response to the therapeutic intervention.

«Combination of Endovascular Procedures and Direct Surgical Heart Revascularization at Different Stages of Treatment

COMBINATION OF ENDOVASCULAR PROCEDURES AND DIRECT SURGICAL HEART REVASCULARIZATION AT DIFFERENT STAGES OF TREATMENT OF PATIENTS WITH CAD

S.A.Yarkov, S.P.Semitko, Z.R. Ovessian, D.G.Iosseliani
(Moscow)

Purpose of study: to evaluate immediate and mid-term results of endovascular procedures (EVP) in patients with previous surgical myocardial revascularization.

Material and methods: the study enrolled 59 patients (90% males) with mean age of 58,3±11,3 years. All patients had a history (mean, 5,6±4,5 years) of coronary bypass surgery (CBG). By the moment of diagnostic coronary angiography 2 (3%) patients were angina-free; 27 (46%) patients had angina of 2-3 functional class; angina of small efforts and at rest was present in 8 (13%) patients; acute coronary syndrome was present in 22 (37%) patients, among them AMI - in 18 (30%) patients.

Basing on the results of coronary angiography and shuntography 45 (77%) patients with history of CBG underwent 54 endovascular procedures (PTCA and/or stenting). In 4 (7%) cases we stented the LCA with the passage on the ostium of CxA. In 25 (46%) cases (9 stenting procedures /16 PTCA) the intervention was performed in the area of distal graft - native artery anastomosis. EVP were performed in native coronary artery in 22 (40%) cases (13 stenting procedures /9 PTCA), and in 3 (5%) cases - in the graft itself.

14 (23%) patients had a history of EVP preceding surgical revascularization: 12 (20%) patients underwent mechanical revascularization and PTCA of the infarct-related artery for emergency indications with the first hours (up to 6 hours) after the onset of AMI; optimal immediate results were obtained (TIMI 3). Taking into the account the baseline multi-vessel character of coronary pool lesion subsequently those patients were submitted to selective surgical revascularization.

Results: optimal immediate angiographic result of endovascular procedures was observed in 95% of cases. The improvement of clinical status with angina decrease by 2 and more functional classes was seen in all the patients. No serious in-hospital cardiac, vascular and other complications were observed. Control angiographic examination (in average at 7,2±5,4 months) was performed in 18 patients (30%). The rate of restenosis in the area of intervention was 34% (38% after PTCA, 23% after stenting; p<0,005).

Conclusions: the combination of endovascular and surgical methods of treatment for CAD at different stages safely improves the effectiveness of treatment of such a difficult category as the patients with multi-vessel coronary lesions. The stenting provides reliably better long-term results after EVP.

COMBINATION OF ENDOVASCULAR AND SURGICAL METHODS OF ASSISTANCE TO THE PATIENTS WITH CARDIAC AND VASCULAR DISEASES IN THE SETTINGS OF REGIONAL MULTI-PROFILE HOSPITAL

V.V. Demin, S.I. Vivtanenko, V.O. Rozhkov, A.K. Almakaev
(Orenburg)

The general tendency of development of the surgical help in modern conditions, including to the patients with cardiac and vascular diseases, is the priority of hi-tech and relatively small-invasive methods. The development of endovascular surgery, as well as open interventions on a beating heart gives the evidence of this tendency. The optimal combination of surgical and endovascular operations allows to increase the volume, quality and higher availability of the treatment of cardiovascular diseases.

In the Orenburg regional clinical hospital №1 endovascular interventions amounted 58.9 % of all reconstructive operations on the heart and vessels executed in the hospital for 2000 - 2003. Thus, in the aortoiliac segment 56.1 % of operations were made by the endovascular method, in the femoropopliteal segment - 38.6 %, on the brachycephalic arteries - 60,3 %, on the visceral and renal arteries - 100 %. Among all interventions on the heart, executed for ischemic heart disease, 59.6 % of operations were performed using endovascular method. Among the interventions for congenital heart diseases, 75.9 % were endovascular as well as 5.1 % of operations for acquired heart diseases. In the department of radiosurgical methods of diagnostics and treatment 99.8 % of operations for cardiac rhythm disturbances were executed. Use of the associated and the combined interventions is practiced rather frequently allowing to reduce traumatization during the operations and to expand opportunities of surgical treatment at persons of advanced age and having a heavy accompanying pathology.

The combination of endovascular methods of treatment and open surgical operations allows to reduce the overall duration of treatment in patients with generalized involvement of vessels due to the opportunity of several anatomic segments correction during a single hospital stay, and to provide timely and rational treatment in case of complications.

MULTI-VESSEL PTCA AND CORONARY BYPASS GRAFTING: COMPARISON OF IMMEDIATE AND LONG-TERM RESULTS

E.V. Merkulov, A.N. Samko, A.A. Shiriaev, I.V. Levitzky,
A.V. Sozykin (Moscow)

The purpose of our investigation was to compare the clinical efficiency and long-term results of PTCA versus CABG in patients with ischemic heart disease having multi-vessel coronary lesions .

Materials and methods: five hundred and forty three (543) patients with two and more coronary vessels involved aged 40 - 74 (55 ± 9) years who underwent successful PTCA or CABG in 1998-2004 were examined in open retrospective nonrandomized study. PTCA was performed in 279 patients and CABG - in 264 patients respectively. Immediate efficiency of treatment and long-term results were estimated by clinical factors, such as: presence of angina, repeated myocardial revasculization (PTCA or CABG), changes in exercise tolerance (stress-test data), myocardial infarction, and death.

Results: average follow-up period was 3.1±0.4 years. The length of hospital stay amounted to 14±8 days for patients undergone PTCA and to 24±10 days for patients undergone CABG. One death was registered in CABG group during the hospital stay; in PTCA group no lethal outcomes occurred. Persistence of angina was more often noticed in PTCA group (13 %), than in CABG group (9 %); repeated myocardial revasculization was performed in 3.2 % of patients after PTCA and in 0.7 % of patients after CABG. Greater increase of exercise stress tolerance was observed in patients after PTCA (81±22 watts) in comparison with patients after CABG (65±18 watts). The myocardial infarction developed in 9 patients (3.2 %) in PTCA group (with Q wave in 3 patients) and in 3 patients (1.1 %) in CABG (with Q wave in 1 patient). The overall in-hospital complications were insignificantly greater in PTCA group as compared with with CABG group (16% and 11 % accordingly). After 6 months of clinical observation the overall complications of PTCA and CABG amounted to 41 % and 24 % respectively. The survival rate and the absence of apparent cardiac complications at the end of follow-up period (3.1 years) numbered 44 % in PTCA group and 56 % in CABG group. Three months after the intervention the angina functional class authentically reduced in comparison with the indices before operation. This dynamics was observed within the follow-up period reaching the minimal values in 6 months in PTCA group and in 1 year in CABG group with insignificant difference at the end of follow-up period.

Conclusions: our findings indicate that the immediate efficiency of treatment and long-term results of PTCA using up-to-date technologies of interventions in patients suffering from coronary artery disease with multi-vessel coronary lesions are comparable to the results of CABG.

EXPERIENCE WITH THE USE OF PTCA AFTER CABG

N.A. Pomossov, A.P. Perevalov, Z.D. Romanova,
S.S. Bydanova (Ijevsk)

From 2001 till May, 2004 10 patients underwent percutaneous transluminal coronary angioplasty (PTCA) after coronary artery bypass grafting (CABG) (CABG was performed 1 day to 6 years

earlier than PTCA). PTCA was performed on 2 coronary arteries in 50% of patients. PTCA followed by stenting was performed in 5 patients. PTCA of the circumflex branch was performed in 5 patients, PTCA of the anterior interventricular branch - in 4 patients, PTCA of the obtuse marginal branch - in 2 patients, and 1 patient underwent PTCA of the diagonal branch. Bypass graft PTA was executed in 2 patients. In 2 patients PTCA was performed on the first day after emergency CABG. One of them had an acute thrombosis of circumflex branch after CABG with the development of posterolateral myocardial infarction. Recanalization and PTCA of circumflex branch were performed with good angiographic result. The other patient had acute thrombosis of mammary graft to the anterior interventricular branch as well as thrombosis of autovenous graft to the circumflex branch with the development of high lateral myocardial infarction. PTCA and stenting of the anterior interventricular branch were performed. Acute stent thrombosis occurred on the 5th day after PTCA (6th day after CABG) with the development of large anteroseptal myocardial infarction resulting in death of the patient. Improvement by one angina functional class was observed in 7 patients out of 8 and improvement by 2 classes - in one patient with functional class IV.

Thus, PTCA in patients with prior coronary bypass grafting is the good alternative for reoperation, in view of the low rate of postoperative complications, small traumatization during intervention, as well as short rehabilitation period.

ENDOVASCULAR INTERVENTIONS IN PATIENTS AFTER AORTO-CORONARY BYPASS GRAFTING

Yu.V. Nemytin, V.A. Ivanov, S.A.Terekhin, Yu.A. Bobkov, I.V. Trunin, S.V. Volkov, I.V. Mostovoy, V.A. Smirnov (Krasnogorsk)

Objective: estimation of the efficiency and long-term results of endovascular surgery in patients with recurrence of the clinical picture of angina in the long-term period after aortocoronary bypass grafting.

Material and methods: over a period of 2002-2004 we carried out the retrospective analysis of endovascular surgery in patients with CAD, with recurrence of angina at various terms (from 1 month till 15 years) after aortocoronary bypass grafting. Ninety two patients (aged 38-76 years) underwent 123 endovascular interventions on native coronary arteries and/or autovenous bypasses for the specified period.

Results: the immediate success of intervention amounted to 95.5 %. No hospital mortality was observed. Serious complications presented as Q wave myocardial infarction were noticed in 4 cases (3.3 %). In 2 cases complications were probably caused by distal embolization during the autovenous bypass surgery.

Positive dynamics was achieved in 73 % of patients; it was clinically expressed in angina functional class improvement by 1-2 classes as well as in complete disappearance of angina in 24 % of patients.

Reinterventions were performed in 20.7 % of patients over a period of 3 months to 1 year.

Conclusion: endovascular intervention in patients with recurrent angina after aortocoronary bypass grafting is an effective and rather safe method of surgical treatment; in patients refractory to conservative therapy with contraindications to repeated aortocoronary bypass grafting it is the only method of choice.

«Miscellaneous - 4»

PATHOGENETIC BASEMENT AND LONG-TERM FOLLOW-UP OF ENDOVASCULAR VARICOCELE TREATMENT IN PATIENTS OF DIFFERENT AGE GROUPS

V.A. Ukolov, V.A. Evdokimov, S.V. Zakharikov, A. A. Lisenok (Moscow)

In this work phlebography data of 415 patients aged 7-48 years with left-side varicocele (198 primary and 217 recurrent) were analyzed. The table shows the number of revealed changes of the kidney veins in sequential age groups.

TABLE

Age (years)	under 12	12-14	15-16	17-18	19-21	above 22	Total
Total (persons)	12	32	85	69	79	138	415
primary/ recurrent	8/4	19/13	40/45	27/42	25/44	79/59	198/217
Testicular-reflux	6/3	15/12	32/40	15/34	19/39	64/47	151/175
Changes in the left renal vein	7/2	14/6	12/24	14/24	19/31	49/37	115/124
Sclerotherapy	3/4	10/8	25/33	19/21	12/20	31/44	100/130

The focus is as follows:

- low medical aid appealability in prepuberty age (15% of primary patients);
- persistent recurrence prevalence in puberty age (50%);
- more than 50% of pathologic changes in this group of patients resulted in renal hypertension, which was the cause of disease recurrence.
- high percentage (45%) of adult patients with diagnosis of "infertile marriage" (the group of patients who can choose by themselves the methods of examination or the methods of treatment as well.

The examination was performed with the UroScope B (Siemens, Germany). The changes in the renal vein were detected in 115 (38%) primary and 124 (42%) recurrent patients, and were classified as follows:

- Organic changes (stenoses) - 49;
- functional changes (external compression by the aorta - 54, aorto-mesenterial clamp (nutcracker phenomenon) - 8);
- anatomically determined changes (retroaortal (31), and ring-shaped (33) renal veins, renal vein duplication - 4).

The functional external compression was observed more often in children. Organic stenoses were combined with the marked opacification of the paravertebral plexus. Testicular reflux was absent in only 11 cases of aorto-mesenterial clamp apparently located at the testicular vein confluence.

In the abovementioned cases, undoubtedly, the objective criteria confirming the relationship between the revealed changes and the renal hypertension are the phlebotonometry data in the presence of pressure gradient in the renal and testicular veins. In the abovementioned cases the testicular reflux was regarded as compensatory reflux, thus we abstained from Ivanissevitch procedure in favour of alternative methods of surgical correction (ileo-testicular anastomosis, testicular saphenous anastomosis,and testiculo-epigastric anastomosis).

Venous drainage type detected by phlebotesticulography excluded the possibility of sclerotherapy performance in 185 patients. Combination of endovascular diagnostics and sclerotherapy in patients with varicocele is an alternative to open surgical treatment, and analysis of spermogram is an integral part of complex approach to diagnostics.

IS EARLY INVASIVE TREATMENT OF UNSTABLE ANGINA EQUALLY EFFECTIVE FOR BOTH WOMEN AND MEN?

F.Besnili, T.Batyraliev, I.Pershukov, A.Samko, Z.Niyazova-Karben, Yu.Belenkov. (Gaziantep, Moscow, Voronej)

Objectives: in this study we sought to evaluate gender differences in the effect of these different strategies.

Methods: the patients (549 women and 1213 men) underwent early invasive or noninvasive strategies. Coronary angiography was performed within the first 7 days in 96% and 10% of the invasive and noninvasive groups, respectively, and revascularization was performed within the first 10 days in 71% and 9% of the invasive and noninvasive groups, respectively.

Results: women presenting with UA were older, but fewer had previous infarctions, left ventricular dysfunction and elevated troponin T levels. Women had fewer angiographic changes. There was no difference in MI or death rate at 12 months among women in the invasive and noninvasive groups (12.4% vs. 10.5%, respectively, P=NS), in contrast to the favorable effect in the invasively treated group of men (9.6% vs. 15.8%, p<0.001). In an interaction analysis, there was a different effect of the early invasive strategy for the two genders (p<0.008).

Conclusion: women with symptoms or signs of UA are older, but still have less severe coronary artery disease and a better prognosis compared with men. In contrast to its beneficial effect in men, an early invasive strategy does not reduce the risk of future events among women.

ENDOGRAFTING OF DESCENDING THORACIC AORTA ANEURYSMS

Z.A. Kavteladze, S.A. Drozdov, K.V. Bylov, D.S. Kartashov, D.P.Dundua, A.M. Babunashvili (Moscow)

Objectives: to evaluate the results of clinical use of nitinol (ZA) drug-coated stents in treatment of the thoracic aorta aneurysms.

Material and methods: endografting of thoracic aorta aneurysms with the use of self-expanding nitinol stents was performed in 14 patients; (three of them had posttraumatic aneurysm). All aneurysms were located in the descending thoracic aorta region. Linear stent-grafts were used for treatment. Mean age of patients was 76±7 years. In 11 cases percutaneous approach with 14-16 F delivery systems was used. Dacron-coated stents (Vascutec) were used, and in one case Zenith (Cook) system was used.

Results: good immediate results (complete isolation of aneurysm, absence of leakage) were observed in 12 patients. In 2 cases of stent implantation in the aneurysm above the left subclavian artery carotid-subclavian bypass grafting was performed. Stent dislocation without any clinical signs developed in one case. Long-term results were assessed within 2 - 48 months follow-up in all patients.

Conclusion: evaluation of immediate and long-term results of descending thoracic aorta aneurysms endografting using self-expanding Dacron-coated nitinol stents shows the prospects of this method, and permits to use it as an alternative to open reconstructive surgery when the aneurism is located in the descending aorta, in patients meeting the strict selection criteria.

SYSTEM FOR THE CLASSIFICATION OF VASCULAR INSUFFICIENCY OF THE BODY'S ORGANS AND PARTS

B.M. Miroliubov (Kazan)

Acute and chronic blood vessel (arteries and veins) diseases lead to pathologic conditions called the acute or chronic arterial and venous insufficiency of corresponding organ or part of the body. Pathologic condition itself is the focal point of treatment more often than the cause of pathology. Any organ can be affected with either acute or chronic arterial or venous insufficiency (AAI, AVI, CAI, and CVI, respectively). However, at the present time, the terms acute myocardial infarction (AMI), acute cerebral circulation disorder (ACCD) are widespread but not acute or chronic myocardial or cerebral ischemia! Existing classifications of arterial and venous insufficiency of organs or parts of the body are created without the indispensable reference to common general principles. These classifications often do not reflect the matter and clinical picture of pathology. It could be explained by the fact that they were created in the middle of last century. But since then our conception of many kinds of pathology has been radically changed. We offer the arterial and venous insufficiency classification system combining already existing systems, and initiating the creation of lacking but necessary classifications of arterial and venous insufficiency of different organs and parts of the body. The system offered is based on the anatomic and temporal principles. We also offer to refer to the severity criteria, which are similar for the acute and chronic pathology of any location, as well.

ROLE OF THE LEFT ATRIUM IN COMPENSATORY MECHANISMS IN PATIENTS WITH POST-INFARCTION LARGE CARDIOSCLEROSIS

I.V. Buzaev, V.V. Plechev, V.S. Buzaev, R.M. Galimov (Ufa)

Twenty eight patients aged 43-65 years with post-infarction large cardiosclerosis were examined. All patients underwent coronary angiography, left ventriculography, pressure measurement in the pulmonary artery and in the left and right ventricles. Volume of the left atrium, its stroke volume and ejection fraction were determined by echocardiography.

Analysis of obtained data showed the inverse relationship between left atrium ejection fraction (LA EF) and systolic pressure in the pulmonary artery (R= - 0.63, p= 0.0016); and between the left atrium ejection fraction (LA EF) and left ventricular end-diastolic pressure (P=-0.68, p<0.05). Analysis of left atrium stroke volume and left ventricular end-diastolic and end-systolic volume values showed no significant relationship between them. However, the relationship between left atrium stroke volume and left ventricle stroke volume was revealed, indicating the contribution of the left atrium to Frank-Starling mechanism.

Thus, post-infarction large cardiosclerosis is accompanied with the decrease of the pump function of the left ventricle, so the left atrium is involved in the compensatory mechanism to maintain predicted total stroke volume. This contribution results in increase of left atrium stroke volume. Thus, increase of the left atrium stroke volume is the compensatory mechanism in post-infarction macrofocal cardiosclerosis.

EXPERIENCE WITH ENDOVASCULAR TREATMENT OF CORONARY ARTERY DISEASE

V.Yu. Bondar, V.A. Razumovsky, K.V. Poliakov,
N.A. Kaganskaya, V.Ya. Rudman, A.K. Babaev (Khabarovsk)

From January 2001 until October 2004 27 patients (mean age 50 years) underwent PTCA procedure. Fourteen of them underwent stenting, 5 patients had two-vessel lesions, 3 patients underwent recanalization of chronic occlusion of the coronary arteries, and 1 patient underwent recanalization of occluded mammary coronary bypass graft. In one case coronary stenting was performed during acute coronary syndrome simultaneously with angiography. BX Velocity, Cordis and Multi-Link TETRA, Guidant coronary stents were used.

Results: recanalization of chronic coronary occlusions failed. Palliative PTA without significant effect was performed on the recanalized left anterior descendent artery in 1 case. Subsequently the patient underwent mammary coronary bypass grafting of the left anterior descendent artery on the beating heart. One patient developed recurrent ventricular tachycardia (VT) during the delivery catheter placement in the orifice of the right coronary artery (RCA); the procedure was aborted. No-reflow phenomenon following PTCA of proximal segment of the right coronary artery (RCA) with subsequent development of myocardial infarction (MI) was observed in 1 case. The urgent stenting of the affected area was performed with TIMI 3 blood flow restoration. Twenty patients presented with optimal angiographic results and smooth postoperative course.

One female patient having cardialgia syndrome underwent repeated angiographic examination at 10 months follow-up after stenting of circumflex artery (Multi-Link TETRA 3,5 x 13 mm). In-stent restenosis (30% luminal narrowing) without hemodynamic significance was revealed, drug treatment was prescribed.

Conclusions: PTCA with stenting in one- to two-vessel stenotic lesions is effective and relatively safe method of surgical treatment for CAD, offering early postoperative activation of patients and possibility of repeated interventions.

CAUSES OF LATE STENT THROMBOSES

V.I.Ganiukov, A.A. Shilov, N.I. Sussoev, I.N. Shigantzov,
E.A. Levchenko, I.Yu. Bravve, M.V. Demina, R.S. Tarassov
(Novosibirsk)

Objectives: to study the cause of late stent thromboses.

Methods: eleven cases of late (more than 2 weeks) stent thrombosis were analyzed. Mean age of patients was 55.73±8.58 years, 8 (72.7%) of them were males. Unstable angina was observed in 4 (36.4%) patients, and stable angina - in 7 (63.6%), respectively. The mean ejection fraction according to echocardiography data was 58.33±7.47%. The following factors were analyzed: length and diameter of implanted stent, antiaggegants intake, the presence of stenosis (>50%) proximally or distally to the intervention area, incomplete stent expansion.

Results: according to noninvasive examination data stent thrombosis was observed on average at 4.95±4.02 months follow-up. Thrombosis was accompanied with development of myocardial infarction in 5 (45.4%) patients, 4 (36.4%) patients had symptoms of unstable angina, and 2 (18.2%) patients developed recurrent exertional angina. The mean length of implanted stents was 20.36±8.15 mm, and stent diameter was on average 3.20±0.43 mm. Retrospective analysis of the causes of late stent thromboses revealed the presence of stenosis >50% proximal or distal to the implanted stent in 4 (36.4%) cases. Two (18.2%) patients interrupted antiaggregants intake by themselves.

Conclusions: According to our data, the most common causes of late stent thromboses were as follows: the presence of stenosis >50% proximally or distally to the implanted stent, interruption of antiaggregants intake, and use of long (20.36±8.15 mm) stents for angioplasty.

OPTIMIZATION OF CORONARY STENTING IN ROUTINE USE OF INTRAVASCULAR ULTRASOUND

A.G. Mizin, P.I. Pavlov, A.R. Beliavsky, A.N. Serenko,
S.A. Akinina, V.I.Kozlov (Khanty-Mansiysk)

Objectives: to evaluate positive and negative sides of routine use of ultrasound control in coronary arteries stenting.

Materials and methods: from November 2002 until July 2004, 433 percutaneous coronary interventions, 170 PTCA using intravascular ultrasound (IVUS)(39% of total number of PTCA procedures) were performed. The prospective study included 49 patients; results of 54 interventions on 59 arteries were examined. The forms of coronary artery disease were as follows: stable angina functional class (FC) 2-3 (74%), myocardial infarction (18%), recurrent angina following coronary bypass grafting (4%), unstable angina (2%), silent myocardial ischemia (2%). Angiographic data showed that "C" stenoses amounted up to 38% of all lesions. In total 80 stents were implanted (1.4±0.6 stents per patient, 1.6±0.8 stents per artery).

Length and diameter of the implanted stents were 17.5±6.1 mm and 3.81±0.56 mm, respectively. The mean stent implantation pressure was 13.4±3.2 atm. Angiographic stent-to-artery ratio was 1.4±0.2. Immediate evaluation of the stenting was performed during intervention by two specialists with the use of MUSIC-criteria, and included calculation of stent symmetry indices, stent cross-section area, and stent to vessel wall apposition.

Results: twenty seven stent redilatations were performed under pressure of 16.7±4.6 atm. Twenty one of these were performed due to suboptimal results of IVUS, and only 6 were performed due to angiographic criteria. In all cases complete stent expansion and accurate stent to vessel wall apposition were achieved. Redilatations following IVUS increased the optimal stenting rate from 35% to 44%. In 16 cases IVUS was performed prior to stent implantation to calculate the vessel size more accurately. No significant difference in the number of optimal results of stenting in the ultrasound assessment group compared to angiographic assessment group was observed. In the whole group of patients, optimal stenting criteria under final IVUS control were achieved in 44% of cases.

Conclusions:

1. Routine use of intravascular ultrasound examination (IVUS) in coronary stenting is necessary since: IVUS slightly increases duration of the procedure and does not increase the number of complications. Its use allowed to increase the optimal stenting rate in the study group by 9%.
2. Routine use of IVUS seems to decrease the acute and subacute thromboses rate due to optimal stenting implantation (complete expansion of stent, accurate stent to vessel wall apposition).
3. Frequent suboptimal results of coronary stenting in the interventional cardiologist's practice can be explained by objective causes and by iatrogenic causes (fear of needless trauma of the artery).

«Transradial Approach: Advantages and Drawbacks. Can it Become an Alternative to Transfemoral Approach?»

PASSAGE FROM TRANSFEMORAL TO TRANSRADIAL APPROACH IN THE PRACTICE OF INTERVENTIONAL CARDIOLOGY: CAN TRANSRADIAL APPROACH BECOME A METHOD OF CHOICE?

A.M. Babunashvili, D.P. Dundua, Z.A. Kavteladze,
D.S. Kartashov (Moscow)

Purpose: to assess the safety, benefits and drawbacks of transradial approach and to define its role in the practice of interventional cardiology.

Materials and methods: transradial approach had been extensively used in the practice of interventional cardiology between January and August 2003 at the Center of Endosurgery and Lithotripsy (690 of 702 coronary artery catheterization procedures, 98.3%). Of the 250 PTCA procedures performed within this time period, 248 (99.2%) were conducted through transradial approach. Of the 452 diagnostic catheterizations of coronary arteries, 442 (97.8%) were also performed via the same approach. Right transradial approach was used more commonly (684 of 690 procedures, 99.1%). PTCA of the left main coronary artery (LMCA) was performed in 8 cases (3.2%), as well as in all large coronary arteries and their branches. In 25 patients (10.1%) we used transradial PTCA for bifurcational stenosis with two guides and "kissing" balloons.

Results: we achieved the stated purposes (diagnostic or PTCA) in all cases of transradial approach. No immediate major cardiac events were observed. In 8 cases (1.2%) we encountered difficulties during the removal of introducer (persistent angiospasm), of these 2 cases required endarterectomy of the distal portion of the radial artery without occlusion of the latter and without any clinical consequences. No cases of puncture site bleeding, false aneurysm or acute thrombosis of the artery were observed during hospital stay. In 5 cases (0.7%) we found subcutaneous hematomas in the forearm. In the long-term period the repeated puncture of the same artery was conducted in 45 patients (6.5%). In another 17 cases the repeated procedure was performed through contralateral transradial approach due to thrombosis of the radial artery (5 cases, 11.1%), due to puncture site scarring (5 cases, 11.1%) with normal pulsation, due to weak pulse measured on the radial artery (3 cases, 6.7%) and due to persistent angiospasm after repeated puncture of the same radial artery (4 cases, 8.9%). There were no long-term undesirable clinical events associated with radial artery catheterization.

Of the 442 diagnostic coronary angiography procedures, 243 (55%) were performed in out-patients, mean hospital stay of patients after PTCA was 2.02 0.8 days.

Conclusion: transradial approach ensures the entire range of invasive coronary catheterization procedures without substantial risk of complications at the artery access site, thus causing substantial reduction of hospital stay and providing the possibility to perform out-patient diagnostic procedures. Transradial approach became a method of choice in our clinical practice for invasive cardiac procedures, particularly in obese patients and patients with known stenoses or severe tortuosity of the iliac arteries.

«Stenting of Small Coronary Arteries: Are There Any Changes in the Last Years?»

STENTING AND PTCA OF SMALL CORONARY ARTERIES: COMPARATIVE ASSESSMENT OF THE LONG-TERM RESULTS

D.G. Gromov, S.P. Semitko, D.G. Iosseliani (Moscow)

Purpose: comparative assessment of long-term clinical and angiographic results of stenting and PTCA of the coronary artery less than 3 mm in diameter.

Material and methods: the study enrolled 267 patients who underwent 205 stenting procedures (group 1) and 120 PTCA (group 2) of native coronary arteries less than 3 mm in diameter between 1999 and 2003. Baseline clinical and angiographic values were not significantly different in both groups. Males over 50 formed statistical majority in both groups. Most interventions were performed on LAD. Reference vessel diameter in group 1 was 2,62±0,01, in group 2 - 2,68±0,01 mm (p<0,07); the degree of stenosis - 82,4±1,0% and 82,5±0,8%, respectively. Coronary occlusion was seen in 16% of cases, among them 23% - in acute stage of the MI. 50% lesions were of B2 or C type.

The procedures were carried out in accordance with the standard technique. Modular and matrix stents "Guidant" and "Cordis" (USA) were used the more often in group 1. In most cases direct stenting was carried out. Mean implantation pressure, as well as balloon dilatation pressure exceeded the nominal value. Optimal immediate result was achieved in group 1 in 97% of cases, in group 2 - in 82%. During and after endovascular procedures standard drug therapy was used. Group 1 patients received Ticlide for 2 months (500 mg daily). Control coronary angiography was performed at least 6 months after the intervention.

Results: at 7,7±1,5 months the rate of restenosis in group 1 was 28,3%, in group 2 - 39,2% (p<0,05). There was no reliable difference between the groups as for the rate of vascular occlusions: 4,4% and 10,8%, respectively (p>0,05).

Independently of the type of procedure the increase of restenosis rate was observed in cases of initially complicated lesion of the coronary bed (B2 and C types): up to 40% in group 1 and up to 54% - in group 2 (p<0,05). In cases of non-complicated stenoses (A and B1 types) no reliable differences were found between the groups: 19% and 28%, respectively (p>0,05). The rate of repeated endovascular procedures in group 1 was 21%, in group 2 - 35% of the total amount of interventions (p<0,05).

The clinical picture of MI (in the target artery pool) was observed in 2 patients (0,98%) after stenting and in 3 (2,5%) - after PTCA, with this Q-MI - in 1 (0,5%) and in 2 (1,7%), respectively (p>0,05). There was 1 death due to LAD stent occlusion. None of the patients needed emergency coronary bypass grafting.

Conclusion: the stenting of small coronary arteries is a preferential endovascular procedure as compared with PTCA from the viewpoint of restenosis and repeated interventions. The rate of late clinical complications in both groups after those procedures wasn't significantly different.

IMMEDIATE AND LONG-TERM RESULTS OF CORONARY STENTING WITH SMALL STENTS

V.I. Ganiukov, A.A. Shilov, N.I. Sussoev, I.N. Shigantzov, E.A. Levchenko, R.S. Tarassov, M. V.Demina, I.Yu. Bravve (Novosibirsk)

Purpose of study: to evaluate immediate and long-term results of the implantation of coronary stents of less then 3 mm diameter, to compare them with the results of the implantation of stents over 3 mm in diameter.

Methods: the study enrolled 129 patients, who underwent the implantation of 143 stents with diameter ≤3.0 mm. The patients in whom drug-eluting stents were implanted were excluded from the study. Mean length of the implanted stent was 16.29±5.29 mm, mean diameter 2.84±0.17 mm. Patients' age varied from 36 to 75 years (mean, 54,94±9,1 years). Unstable angina was present in 30(23,2%), stable angina in 84 (65,2%) patients, 15 patients (11,6%) had percutaneous coronary intervention performed in subacute stage of the MI. 54 patients (41?9%) had the history of postinfarction cardiosclerosis. Mean ejection fraction, as judged by EchoCG, was,64±8.82%. We analyzed immediate as well as long-term results of PTCI (mean follow-up duration 11.17±7.64 months). The obtained results were compared with the results of 100 PTCA with implantation of the stents with mean diameter 3,57±0.45 mm (p<0.001). We evaluated clinical data (death, recurrence or enhancement of angina, myocardial infarction after PTCI, absence of angina), angiographic data.

Results: in the group with small (<3 mm) stents immediate angiographic success was seen 128 cases (99,2%), 1 female patient (0,8%) died of acute stent thrombosis after successful revascularization on the background of acute coronary syndrome. Long-term results were followed in 72 patients (55,8% of the total number of PTCA). The analysis of the long-term results suggested that clinical improvement (absence or decrease of functional class of angina, negative stress test) was preserved in 57 patients (79,2%). 12 patients (16,7%) noticed the recurrence of the angina or the increase of its functional class, 3 patients developed myocardial infarction (4,1%). Repeated intervention was carried out in 12 patients (16,7%). Among them in 8 cases we performed repeated PTCI, 4 patients underwent aorto-coronary bypass surgery. The comparison with the group with stents' diameter >3 mm showed comparable results as for the age, diagnosis. the rate of immediate success and clinical improvement in the long-term follow-up. Repeated interventions in the group with stents' diameter > 3 mm were performed in 6 out of 61 patients, who contacted us in the long-term follow-up (9,8%) (p=0.37 as compared with small stents implantation).

Conclusions: immediate and long-term results, the rate of repeated myocardial revascularization after the implantation of the stents with < 3 mm and > 3 mm diameters are similar.

«Endovascular Interventions in Valvular Heart Diseases»

CATHETER BALLOON MITRAL VALVULOPLASTY IN PREGNANT

V.B. Nemirovsky, L.E. Murashko, L.S. Kokov, S.G. Belitzkaya, L.M. Smirnova, M.Yu. Sokolova, M.V. Ilyina (Moscow)

From July 1994 fifty four (54) women on different terms of pregnancy (24-38 weeks) with rheumatic mitral stenosis underwent catheter balloon mitral valvuloplasty (CBMV). In 15 cases CBMV was performed as an emergency surgical intervention for vital indications in the state of pulmonary edema. In the remaining cases the indications for CBMV were: the decrease of the effective area of mitral orifice to less than 1,5 cm^2, transmitral pressure gradient over 10 mm Hg with typical clinical manifestations of the disease.

In all cases CBMV was performed with Russian balloon catheters designed by Silin and Sukhov, that can reach the diameter of 35 mm while sustaining the pressure up to 8 atm., thus allowing not only for more effective relief of valvular adhesions, but also to divide the adhesions on the level of mitral valve chordae tendinae.

The area of mitral valve orifice increased in average from 1,29 cm^2 to 3,4 cm^2. Transmitral gradient decreased in average from 34 to 6 mm Hg. Systolic pressure in the pulmonary artery decreased from 70 to 35 mm Hg. Three days after the procedure of CBMV cardiac index rose from 2,2 to 4,3 $l/min/m^2$. Hemopericardium with the volume up to 70 ml developed in 2 cases after transseptal puncture. Both patients received drug treatment.

Fifty three patients had timely delivery. Among them 43 women had spontaneous delivery, 10 had Caesarian section. Our patients gave birth to 54 live children, among them two twinnings, with Apgar score of 7 - 9. In one case only the child died antenatally due to premature detachment of placenta.

Conclusion: catether balloon mitral valvuloplasty is an effective and low traumatic mean for the correction of rheumatic mitral stenosis in pregnant. We consider this intervention a method of choice for defect correction in this group of patients.

LONG-TERM RESULTS OF CATHETER BALLOON MITRAL VALVULOPLASTY (CBMV) IN PATIENTS WITH COMPLICATED MITRAL STENOSIS

L.S. Kokov, A.V. Protopopov, T.A. Kochkina, K.V. Timoshenko (Moscow)

Purpose of study: to follow the results of CBMV in patients with complicated mitral valve stenosis.

Material and methods: the study enrolled 119 patients with mitral valve stenosis aged from 32 to 63 years (among them 10 men), who underwent catheter balloon mitral valvuloplasty (CBMV) according to the method suggested by V.A. Silin and V.K. Sukhov. On the base of complex ranked evaluation (CRO) of the patients' and mitral valve state all the patients were stratified into groups:1. with non-complicated mitral stenosis (n=73); 2. with complicated mitral stenosis (n=46). Dynamical monitoring of the long-term results was conducted between the groups on comparative basis. Long-term results of CBMV were followed up to 60 months. Death, mitral valve replacement and recurrence of heart failure up to III-IV NYHA class were used as control indices. From the total number of patients in 94,1% (n=112) the results were followed for 6 months, in 89,9% (n=107) for 1 year, in 82,3% (n=98) for 2 years, in 76,5% (n=91) for 3 years, in 72,3% (n=8) for 4 years and in 60,5% (n=72) for 5 years. The number of patients available for the follow-up: group 1 - 69 (94,5%), group 2 - 43 (93,5%).

Results: both groups of patients differed reliably as for the rate of mitral valve replacement (6,8% vs. 26,0%, p<0,001), repeated CBMV (4,2% vs. 23,9%, p<0,001) and combination of unfavorable events (17,8% vs. 54,3%, p<0,001). There was no reliable difference in late mortality rate between the groups (4,1% vs. 4,3%, NS).

Conclusions: CBMV is an effective method for mitral stenoses correction in patients with complicated morphology of the disease.

TRANSESOPHAGEAL EchoCG DURING CATHETER BALLOON MITRAL VALVULOPLASTY

M.V. Ilyina, L.S. Kokov, A.N. Korostelev, T.A. Kochkina, A.V. Protopopov, K.V. Timoshenko, V.V. Demin (Moscow)

Purpose of study: to show the feasibility and to assess the effectiveness of EchoCG used as an assisting intervention during catheter balloon mitral valvuloplasty (CBMV).

Material and methods: we analyzed the results of 172 endovascular interventions of catheter balloon mitral valvuloplasty (CBMV) for left AV orifice stenosis. The patients were aged from 39 to 68 years (mean, 45+8). In 110 patients the endovascular intervention was primary, among them in 35 patients on different terms of pregnancy (28,5 - 36 weeks.) In 62 patients the intervention was carried out for mitral restenosis. Atrial fibrillation was present in 42 patients.

From 1988 to 1989 CBMV was performed in 28 patients without intraoperative echocardiographic control. From 1990 transthoracic EchoCG served as a method of visual control beside roentgenoscopy and invasive pressure registration - 127 interventions. From 2000 echocardiographic was completed in 17 patients by transoesphageal EchoCG (TEEchoCG). In those patients transoesophageal probe was placed before intervention. All the stages of intervention - transseptal puncture of the left atrium, passage of dilatation devices, mitral balloon valvuloplasty were carried out under TEEchoCG control. Vascular approach was realized through femoral artery and vein. Dilatation catheter was advances to the mitral orifice transvenously, through atrial septum and left atrium. For this purpose we performed transseptal puncture (TSP).

Results: before the correction all patients had pulmonary hypertension of 1-2 degree, mitral orifice area was 1,2-1,5 cm^2. Initial mitral pressure gradient was 18-22 mm Hg. In most patients due to the increased pressure in the left atrium, atrial septum bulged into the right atrium causing the smoothening of the fossa ovalis. It contributed to the difficulty of the search of the point for transseptal puncture without additional EchoCG control. In 6 out of 28 group 1 patients left atrial wall was perforated during TSP causing hemopericardium, which necessitated surgical intervention in 4 patients. Beside, in 2 patients CBMV was complicated by left ventricular apex perforation, which necessitated emergency surgical interventions. One female patient died. It is worthy of note that such rate of complications can be explained by the period of primary experience accumulation as well.

The use of transthoracic EchoCG in group 2 patients permitted to decrease the number of complications related to transseptal puncture and intracardiac manipulations in the mitral valve. With this we noticed only three cases of hemopericardium related to TSP. The rupture of the anterior mitral cusp was diagnosed intraoperatively with EchoCG in one female patient. The abruption of daughter chordae of the mitral valve was observed in two patients. The use of TEEchoCG allowed for highly precise performance of transspetal puncture of the left atrium through the fossa ovalis, which is mostly important in left atrial hypertrophia and hypertension. In patients with mitral restenosis the puncture of atrial septum is linked to special difficulties due to scar degeneration. TEEchoCG allowed for intraoperative control of the dynamics of the increase of mitral valve orifice and transmitral blood flow, the changes of cusp movement velocity. With this TEEchoCG itself didn't require the stopping of the main intracardiac manipulations, while the quality of imaging and the precision of measurements taken with this method significantly exceeded similar data received with transthoracic EchoCG. After the intervention TEEchoCG allowed to reveal the development of residual left to right blood shunting at the atrial level in one female patient with basic mitral restenosis. However one cannot completely exclude intraioperative complication related to TSP and intracardiac manipulations in this group of patients. Erroneous puncture of the aortic root occurred in one female patient during TSP due to high left atrial hypertension. This complication was timely diagnosed and emergency heart surgery was performed. Balloon mitral valvuloplasty resulted in the increase of mitral orifice area up to 2,5-3,2 cm^2, the decrease of mitral pressure gradient to 4-8 mm Hg and of the pulmonary arterial pressure to 25-27 mm Hg in all the patients. The degree of mitral insufficiency wasn't increased. One female patient with grade 2 mitral insufficiency the later even decreased to grade 0-1.

The female patient with atrial fibrillation had stable sinus rhythm recovery with the help of 360 kJ electrical discharge 1 day after the intervention.

Conclusions: TEEchoCG is a safe and highly precise method for assisting control of the course and results of catheter balloon mitral valvuloplasty. It contributes to the increase of safety of endovascular cardiac interventions.

OUR EXPERIENCE WITH BALLOON VALVULOPLASTY FOR THE TREATMENT OF VALVULAR AORTIC AND PULMONARY ARTERIAL STENOSES

V.Yu. Bondar, V.A. Razumovsky, K.V. Poliakov,
N.A. Kaganskaya (Khabarovsk)

Between 1997 and 2004 we performed 21 procedures of balloon valvuloplasty (BV) for pulmonary valvular stenosis (PVS) and 1 BV for valvular aortic stenosis (VAS). Mean age of patients was 9 years (1- 20 years). In all cases standard femoral vascular approach was used.

Pre-operative pressure gradient on the pulmonary arterial valve varied from 55 to 120 mm Hg. The interventions were carried out from a standard approach through femoral vein under general anesthesia. Low-pressure balloons (u to 6 atm.) were used for dilatation.

In 1 case with critical PVS the intervention was carried out on two stages with 11-months interval, in another case we used two-balloon technique because of the lack of necessary balloon size. One patient developed refractory bradycardia during the placement of rigid lead into the pulmonary artery, the procedure was stopped. In the remaining cases the patients tolerated the intervention, the procedure gave good immediate result and positive clinical effect.

Balloon plasty of the valvular aortic stenosis was carried out in a 12-year child with bicuspid aortic valve. Cusps dehiscence was reduced to 4 mm with fibrous ring diameter of 20 mm. Left ventricular systolic pressure 212 mm Hg, systolic pressure gradient on the aortic valve 137 mm Hg. After two dilatations with high-pressure balloon cusps dehiscence increased up to 13 mm, systolic pressure gradient decreased to 63 mm Hg (54% of the initial value); control aortograms didn't reveal the signs of aortic insufficiency. Postoperative period was uneventful, marked clinical improvement was noticed.

Conclusions: balloon valvuloplasty is a low traumatic method and gives the possibility to perform repeated interventions. It is a perspective method of surgical treatment for valvular stenosis of the aorta and pulmonary artery.

«Complications of Interventional Procedures»

COMPLICATIONS OF PERIPHERAL ANGIOPLASTY

Z.A. Kavteladze, S.A. Drozdov, D.P. Dundua, D.S. Kartashov (Moscow)

Purpose of study: the analysis of the cases of complications of peripheral angioplasty in atherosclerotic lesion of the lower limbs' arteries.

Material and methods: we analyzed the results of peripheral angioplasty for the lesions of the lower limbs' arteries in 810 patients who underwent 1034 interventions. Acute arterial dissection after PTA was not included into the analysis, as it was commonly relieved with stenting. The main complications were: arterial perforation - 2 (0,19%) cases; distal macroembolism - 5 (0,48%) cases; thrombosis at the puncture site - 2 (0,19%) cases, false aneurysm of the puncture hole - 5 (0,48%) cases. Arterial perforation during primary recanalization of the occlusions and microembolism of the distal bed without angiographic signs and functional changes were not taken into the account. Arterial perforations and distal marcoembolism were treated with the use of catheter technique, while in cases of thrombosis or false aneurysm at the puncture site surgery was used.

Conclusion: separate or combined use of catheter technique and surgical methods allows for successful treatment of life-threatening complications of peripheral angioplasty of the lower limbs' arteries.

CAUSES OF THROMBOTIC OCCLUSIONS OF THE INFERIOR VENA CAVA AFTER ENDOVASCULAR PROPHYLACTICS OF PULMONARY ARTERY THROMBOEMBOLISM

A.G. Zlatovratsky (Moscow)

Purpose of study: the analysis of the causes of total inferior vena cava thrombosis after cava-filters implantation at hospital stage and in the follow-up period, the assessment of different factors influencing its rate.

Material and methods: the study enrolled 492 patients with thrombotic lesion of the inferior vena cava (IVC) system caused by pulmonary artery thromboembolism (PATE) who underwent cava-filter implantation (CFI) between 1998 and 2000, as well as 112 patients re-admitted with preliminary diagnosis of IVC thrombosis. Primary examination revealed floating thrombi in the IVC in 86% of patients, in the iliac veins - in 46,8:% and in the femoral veins - in 31,4% of patients. The size of floating thrombus' apex exceeded 3 cm. PATE was revealed in 154 patients, being massive in 48,7% of them. "Sandglass" cava-filter was implanted in 401 (81,3%) patients, "Umbrella" - in 84 (17,1%), REPTELA - in 3 (0,6%), and Trap Ease - in 4 (0,8%) patients. In 8 (1,8%) cases CFI was preceded by endovascular catheter thrombectomy from the OVC, in 4 (0,8%) - by the ligation of the superficial femoral vein.

During in-hospital stage thrombotic occlusion of IVC was revealed in 34 (6,9%) patients. In 16 (3,2%) cases it was caused by emboli in the cava-filter. In 2 cases the thrombus spread over the CF. Three patients (0,6%) died. The highest rate of IVC thrombosis early after CFI was observed in patients with thrombus' apex localization in the femoral veins or IVC (11,8% and 10,3%, respectively), with floating segment's length from 3 to 10 cm (21,8%) and with the disease duration of 8 - 14 days (11,9%). The history of PATE also significantly contributed to the increase of the rate of IVC occlusion depending on the severity of pulmonary hypertension (9,5%, 14,6% and 18,2%, respectively, in 1 -2 - 3 degree hypertension).

Late IVC occlusion in patients after PATE and the implantation of two-level models of the cava-filters was revealed in 27,2% of cases, after single-level models' implantation - in 15%. In cases of concomitant pathology leading to left and right heart overload IVC thrombosis after CFI was observed more commonly and depended on the cava-filter design (23,3% - with single-level and 36,4% with two-level models).

Thus, the rate of thrombotic occlusion of the IVC after CFI depends on the character of thrombosis, its length and extension, the length of floating, the patency of the distal bed, the severity of prior pulmonary embolism, the presence of concomitant diseases and technical design of the cava-filter.