

INTERVENTIONAL CARDIOLOGY

Percutaneous Coronary Interventions in Patients with Left Main Coronary Artery Disease: Experience of the Hospital without On-Site Cardiac Surgery

I.S. Bessonov, I.P. Zyryanov, V.A. Kuznetsov, S.S. Sapozhnikov, E.P. Samoylova, E.A. Gorbatenko

Advisability of Incomplete Multivessel Revascularization in Patients with ST-Elevation Myocardial Infarction and Multivessel Coronary Artery Disease

R.S. Tarasov, V.I. Ganyukov, Yu.V. Krotikov, O.L. Barbarash, L.S. Barbarash

Impact of Myocardial Reperfusion Timing on Immediate and Long-Term Disease Prognosis in Patients with Acute ST-Elevation Myocardial Infarction (STEMI)

D.G. Iosseliani, I.Yu. Kostyanov, P.S. Vasiliev, A.G. Koledinsky, D.G. Gromov, I.A. Kovalchuk, O.E. Sukhorukov, M.B. Matini, V.L. Baratashvili

INTERVENTIONAL ANGIOLOGY

Retrograde Approaches for Recanalization of Complex Infringuinal Arterial Occlusive Disease

A.I. Pityk

INVASIVE DIAGNOSTICS

The Use of Intravascular Diagnostic Techniques for Coronary Bifurcation Lesions

V.A. Ivanov, S.A. Belyakin, A.V. Ivanov, V.V. Mayskov, S.V. Permyakov, E.V. Tsymbal, I.S. Bazanov, S.B. Zharikov

CLINICAL CASES

Successful Staged Stenting of the Vessels from Different Cardiovascular Territories in a Female Patient with Multifocal Atherosclerosis at High Risk for Coronary Artery Bypass Grafting (clinical case)

D.G. Iosseliani, T.I. Yanushevskaya, A.S. Galaktionova, S.V. Rogan, R.Yu. Popov

A Clinical Case of Successful Closure of Post-Infarction Ventricular Septal Defect by Amplatzer Occluder on Day 4 from the Disease Onset

S.P. Semitko, V.P. Klimov, A.I. Analeev, I.M. Gubenko, S.D. Klimovskiy, N.S. Krylova, D.A. Egorov, S.P. Saprykin, Z.S. Shogenov, N.A. Karpun

Percutaneous Coronary Interventions in Patients with Left Main Coronary Artery Disease: Experience of the Hospital without On-Site Cardiac Surgery

I.S. Bessonov, I.P. Zyryanov, V.A. Kuznetsov, S.S. Sapozhnikov, E.P. Samoylova, E.A. Gorbatenko*

Branch of the Research Institute of Cardiology of the Siberian Division
of the Russian Academy of Medical Sciences Tyumen Cardiology Center, Tyumen, Russia

Feasibility of PCIs in the hospital without on-site cardiac surgery was investigated in 70 patients with LMCA disease. The in-hospital and long-term results were analyzed. The factors affecting the long-term results were determined. The collected data made it possible to conclude that PCIs in this population are effective and relatively safe to be performed in the hospital without on-site cardiac surgery.

Key words: percutaneous coronary interventions, left main coronary artery, hospital without on-site cardiac surgery.

*** Address for correspondence:**

Dr. Ivan Bessonov

Tyumen Cardiology Center

111, Melnikayte str., Tyumen, Russia

Phone: (Fax): 3452-20-53-49; Cell. phone 8-906-823-77-55

E-mail: Ivan_Bessnv@mail.ru

References

1. DeMots H., Rosch J., McAnulty J.H. Left main coronary artery disease. *Cardiovasc. Clin.*, 1977, 8, 201–211.
2. Guidelines on myocardial revascularization: The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). *Eur. Heart J.*, 2010, 31 (20), 2501–2555.
3. Kuznetsov V.A., Zyryanov I.P., Kolunin G.V. et al. Coronary Angiography Registry. Database state registration certificate # 2010620075, recorded in the Database Registry on February 01, 2010. (in Russian)
4. Silber S., Albertsson P., Aviles F.F. et al. Guidelines for percutaneous coronary interventions. The Task Force for Percutaneous Coronary Interventions of the European Society of Cardiology. *Eur. Heart J.*, 2005, 26 (8), 804–847.
5. Feldman T. The 5-year Outcomes of the SYNTAX Trial in the subset of patients with left main disease. Available at: <http://www.tctmd.com/show.aspx?id=114848>
6. Kutcher M.A., Klein L.W., Ou F.S. et al. Percutaneous coronary interventions in facilities without cardiac surgery on site: a report from the National Cardiovascular Data Registry (NCDR). *J. Am. Coll. Cardiol.*, 2009, 30, 54 (1), 16–24.

7. Medina A., Surez de Lezo J., Pan M. A new classification of coronary bifurcation lesions. *Rev. Esp. Cardiol.*, 2006, 59, 149–153.
8. Jacobs A.K., Normand S.L.T., Massaro, J.M. et al. Nonemergency PCI at Hospitals with or without On-Site Cardiac Surgery. *N. Engl. J. Med.*, 2013, 368, 1498–1508
9. Yang E.H., Gumina R.J., Lennon R.J. et al. Emergency coronary artery bypass surgery for percutaneous coronary interventions: changes in the incidence, clinical characteristics, and indications from 1979 to 2003. *J. Am. Coll. Cardiol.*, 2005, 46, 2004–2009.
10. Hurtado J., Pinar Bermudez E., Redondo B. et al. Emergency percutaneous coronary intervention in unprotected left main coronary arteries. Predictors of mortality and impact of cardiogenic shock. *Rev. Esp. Cardiol.*, 2009, 62 (10), 1118–1124.
11. Pedrazzini G., Radovanovic D., Vassalli G. et al. Primary percutaneous coronary intervention for unprotected left main disease in patients with acute ST-segment elevation myocardial infarction the AMIS (Acute Myocardial Infarction in Switzerland) plus registry experience. *JACC: Cardiovasc. Interv.*, 2011, 4 (6), 627–633.
12. Patel M., Dehmer G., Hirshfeld J. et al. ACCF/SCAI/STS/AATS/AHA/ ASNC/ HFSA/SCCT 2012 Appropriate Use Criteria for Coronary Revascularization Focused Update. *J. Am. Coll. Cardiol.*, 2012, 59 (9), 857–881.
13. Chieffo A., Park S., Valgimigli M. et al. Favorable long-term outcome after drug-eluting stent implantation in nonbifurcation lesions that involve unprotected left main coronary artery: a multicenter registry. *Circulation*, 2007, 116 (2), 158–162.
14. Tamburino C., Capranzano P., Capodanno D. Plaque distribution patterns in distal left main coronary artery to predict outcomes after stent implantation. *JACC: Cardiovasc. Interv.*, 2010, 3 (6), 624–631.
15. Palmerini T., Marzocchi A., Tamburino C. et al. Impact of Bifurcation Technique on 2-Year Clinical Outcomes in 773 Patients With Distal Unprotected Left Main Coronary Artery Stenosis Treated With Drug-Eluting Stents. *Circulation: Cardiovascular Interventions*, 2008, 1, 185–192.

Advisability of Incomplete Multivessel Revascularization in Patients with ST-Elevation Myocardial Infarction and Multivessel Coronary Artery Disease

R.S. Tarasov, V.I. Ganyukov*, Yu.V. Krotikov, O.L. Barbarash, L.S. Barbarash*

Scientific Research Institute for Complex Issues of Cardiovascular Diseases,
Siberian Branch of the Russian Academy of Medical Sciences, Kemerovo, Russia

There are some strategic issues regarding the treatment of patients with ST-segment elevation myocardial infarction at multivessel coronary artery disease which are not completely solved. In particular, evidential base for multivessel stenting within the scope of primary percutaneous coronary intervention is controversial. This may be related to the absence of guidelines regulating advisability of complete and incomplete revascularization in this group of patients. Strategies of reasonable complete and incomplete revascularization in patients with ST-segment elevation myocardial infarction undergoing multivessel stenting have been comparatively analyzed in this study.

Key words: myocardial infarction, incomplete myocardial revascularization, multivessel lesion, multivessel stenting.

*** Address for correspondence:**

Scientific Research Institute for Complex Issues of Cardiovascular Diseases, Siberian Branch of the Russian Academy of Medical Sciences

6, Sosnovy Boulevard, Kemerovo, Russia, 650002

Dr. Roman Tarasov – Tel. +7-923-526-04-46. E-mail roman.tarasov@mail.ru

Dr. Vladimir Ganyukov – Tel. +7-913-127-39-05. E-mail: ganyukov@mail.ru

References

1. Dauerman H.L. Reasonable Incomplete Revascularization. *Circulation*. 2011; 123: 2337–2340.
2. Buda AJ, Macdonald IL, Anderson MJ, Strauss HD, David TE, Berman ND. Long-term results following coronary bypass operation. Importance of preoperative actors and complete revascularization. *J. Thorac. Cardiovasc. Surg.* 1981; 82: 383–890.
3. Kleisli T., Cheng W., Jacobs M.J., et al. In the current era, complete revascularization improves survival after coronary artery bypass surgery. *J. Thorac. Cardiovasc. Surg.* 2005; 129: 1283–1291.
4. Hannan E.L., Racz M., Holmes D.R. et al. Impact of completeness of percutaneous coronary intervention revascularization on long-term outcomes in the stent era. *Circulation*. 2006; 113: 2406–2412.
5. Hannan E.L., Wu C., Walford G. et al. Incomplete revascularization in the era of drug-eluting stents: impact on adverse outcomes. *J. Am. Coll. Cardiol. Cardiovasc. Interv.* 2009; 2: 17–25.

6. van den Brand M.J., Rensing B.J., Morel M.A. et al. The effect of completeness of revascularization on event-free survival at one year in the ARTS trial. *J. Am. Coll. Cardiol.* 2002; 39: 559–564.
7. Kirschbaum S.W., Springeling T., Boersma E. et al. Complete percutaneous revascularization for multivessel disease in patients with impaired left ventricular function: pre- and post-procedural evaluation by cardiac magnetic resonance imaging. *J. Am. Coll. Cardiol. Cardiovasc. Interv.* 2010; 3: 392–400.
8. Kim Y.H., Park D.W., Lee J.Y. et al. Impact of angiographic complete revascularization after drug-eluting stent implantation or coronary artery bypass surgery for multivessel coronary artery disease. *Circulation.* 2011; 123: 2373–2381.
9. Serruys P.W., Morice M.C., Kappetein A.P. et al. Percutaneous coronary intervention versus coronary-artery bypass grafting for severe coronary artery disease. *N. Engl. J. Med.* 2009; 360: 961–972.
10. Rastan A.J., Walther T., Falk V. et al. Does reasonable incomplete surgical revascularization affect early or long-term survival in patients with multivessel coronary artery disease receiving left internal mammary artery bypass to left anterior descending artery? *Circulation.* 2009; 120: S70–S77.
11. Cohen D.J., Van H.B., Serruys P.W. et al. Quality of life after PCI with drug-eluting stents or coronary-artery bypass surgery. *N. Engl. J. Med.* 2011; 364: 1016–1026.
12. Behan M.W., Holm N.R., Curzen N.P. et al. Simple or complex stenting for bifurcation coronary lesions: a patient-level pooled-analysis of the Nordic Bifurcation Study and the British Bifurcation Coronary Study. *Circ. Cardiovasc. Interv.* 2011; 4: 57–64.
13. Barbarash L.S., Ganyukov V.I. Organization and tactic of percutaneous coronary intervention in ST-elevation myocardial infarction. Kemerovo; 2012. (in Russian)
14. Nikolaos D. Papamichael, Lampros K. Michalis. Staged Percutaneous Coronary Intervention for Multivessel STEMI Patients? *HOSPITAL CHRONICLES.* 2010; SUPPLEMENT: 58–59.
15. Jan-Henk E., Dambrink Jan P., Debrauwere, Arnoud W.J. et al. Non-culprit lesions detected during primary PCI: treat invasively or follow the guidelines? *Eurointervention.* 2010; 5: 968–975.

Impact of Myocardial Reperfusion Timing on Immediate and Long-Term Disease Prognosis in Patients with Acute ST-Elevation Myocardial Infarction (STEMI)

D.G. Iosseliani¹, I.Yu. Kostyanov^{1}, P.S. Vasiliev¹, A.G. Koledinsky¹, D.G. Gromov¹, I.A. Kovalchuk¹, O.E. Sukhorukov¹, M.B. Matini¹, V.L. Baratashvili²*

¹ Moscow City Centre of Interventional Cardioangiology

² Russian National Research Medical University named after N.I. Pirogov

³ Emergency Medical Care Station named after A.S. Puchkov, Moscow, Russia

From 2001 through 2011, endovascular interventions have been performed in Moscow City Center of Interventional Cardioangiology in 3770 patients with STEMI. Combined thrombolytic and endovascular treatment of the infarct-related artery (IRA) was performed in 1091 cases. We have elaborated and inculcated into the clinical practice the algorithms of diagnostic and therapeutic interventions for STEMI patients allowing the reduction of time for emergency care of such patients. During the described period, the decreased time of myocardial reperfusion in STEMI patients due to broader use of thrombolytics, optimization of organizational measures, including the interaction with emergency care services, allowed to decrease in-hospital mortality from 4,6% to 1,2%, to significantly reduce the rate of MACE. The combination of pre-hospital thrombolytic therapy and endovascular angioplasty provides earlier and fuller correction of the blood flow in the IRA, significantly improvement of in-hospital and long-term prognosis in STEMI patients.

Key words: acute myocardial infarction, thrombolytic therapy, endovascular procedures.

* Address for correspondence:

Dr. Igor Kostyanov

Moscow City Centre of Interventional Cardioangiology, Moscow Healthcare Department

5, Sverchkov per., Moscow, 101000, Russia

Tel. +7 495-624-96-36

E-mail: kostpravka89@mail.ru

References

1. Baratashvili V.L., Iosseliani D.G., Koledinsky A.G., Kostyanov I.Yu. et al. Early staged restoration of impaired blood supply of the heart and improvement of immediate and mid-term prognosis in patients with acute myocardial infarction. Collection of works (edited by Iosseliani D.G. and Seltsovskiy A.P.) M., 2009. (in Russian)
2. Iosseliani D.G., Filatov A.A., Rogan S.V. et al. Restoration of blood flow in the infarct-related coronary artery in acute myocardial infarction: effective or just spectacular? International Journal of Interventional Cardioangiology, 2003, 1, p. 27–30.
3. Iosseliani D.G., Semitko S.P., Koledinsky A.G. et al. Combined use of prehospital systemic thrombolytic therapy (TLT) and angioplasty of the infarct-related artery (IRA)

- at the in-hospital stage in treatment of acute myocardial infarction (AMI). *International Journal of Interventional Cardioangiology*, 2005, 7, p. 20.
4. Oshchepkova E.V. Cardiovascular mortality in population of the Russian Federation in 2001–2006 and the ways for its reduction. *Cardiology*, 2009, 2, 67–72. (in Russian)
 5. Khubutiya M.Sh., Gazaryan G.A., Zakharov I.V. Reperfusion therapy in acute period of myocardial infarction. M., GEOTAR-Media, 2010, 168 p. (in Russian)
 6. AIMS Trial Study Group Effect of intravenous APSAC on mortality after acute myocardial infarction: Preliminary report of a placebo-controlled clinical trial. *Lancet*, 1988, 1, 545.
 7. Fibrinolytic Therapy Trialists (FTT) Collaborative Group: Indication for fibrinolytic therapy in suspected acute myocardial infarction: Collaborative overview of early mortality and major morbidity results from all randomized trials of more than 1000 patients. *Lancet*, 1994, 343, 311.
 8. McNamara R.L., Wang Y., Herrin J. et al. Effect of door-to-balloon time on mortality in patients with ST-segment elevation myocardial infarction. *J. Am. Coll. Cardiol.* 2006, 47, 2180–2186.
 9. Brodie B.R., Hansen C., Stuckey T.D., et al. Door-to-balloon time with primary percutaneous coronary intervention for acute myocardial infarction impacts late cardiac mortality in high-risk patients and patients presenting early after the onset of symptoms. *J. Am. Coll. Cardiol.*, 2006, 47, 289–295.
 10. Keelley E.C., Boura J.A., Grines C.L. Primary angioplasty versus intravenous thrombolytic therapy for acute myocardial infarction: a quantitative review of 23 randomized trials. *Lancet*, 2003, 361, 13–20.
 11. Bates E.R., Nallamothu B.K. Commentary: the role of percutaneous coronary intervention in ST-segment-elevation myocardial infarction. *Circulation*, 2008, 118 (5), 567–573.
 12. Pinto D.S., Kirtane A.J., Nallamothu B.K., et al. Hospital delays in reperfusion for ST-elevation myocardial infarction. Implications when selecting a reperfusion strategy. *Circulation*, 2006, 114 (19), 2019–2025.
 13. Cantor W., Fitchett D., Borgundvaag B., et al. Routine early angioplasty after fibrinolysis for acute myocardial infarction. *N. Engl. J. Med.*, 2009, 360, 2705–2718.
 14. Gersh B.J., Stone G.W., White H.D., Holmes D.R.. Pharmacological facilitation of primary percutaneous coronary intervention for acute myocardial infarction. Is the slope of the curve the shape of the future? *JAMA*, 2005, 293, 979-986.
 15. Morrison L.J., Verbeek P.R., McDonald A.C. et al. Mortality and prehospital thrombolysis for acute myocardial infarction: A meta-analysis. *JAMA*, 2000, 283 (20), 2686–2692.
 16. Blankenship J., Scott T., Skelding K., et al. Door-to-Balloon Times Under 90 min can be routinely achieved for patients transferred for ST-segment elevation myocardial infarction percutaneous coronary intervention in a rural setting. *J. Am. Coll. Cardiol.*, 2011, 57, 272–279.
 17. Brodie B., Gersh B., Stuckey T., et al. When Is Door-to-Balloon Time Critical? Analysis From the HORIZONS-AMI (Harmonizing Outcomes with Revascularization and Stents in Acute Myocardial Infarction) and CADILLAC (Controlled Abciximab and Device

- Investigation to Lower Late Angioplasty Complications) Trials. *J. Am. Coll. Cardiol.*, 2010, 56, 407–413.
18. ASSENT-4 PCI Investigators. Primary versus tenecteplase-facilitated percutaneous coronary intervention in patients with ST-segment elevation acute myocardial infarction (ASSENT-4 PCI) randomized trial. *Lancet* 2006, 367, 569–578.
 19. Herrmann H.C., Lu J., Brodie B.R., et al. Benefit of facilitated PCI in high risk ST-elevation myocardial infarction patients presenting to non-PCI hospitals. *J. Am. Coll. Cardiol. Interv.*, 2009, 2, 917–924.
 20. Ellis S.G., Tendera M., de Belder M.A., et al. Facilitated PCI in patients with ST-elevation myocardial infarction. *N. Engl. J. Med.*, 2008, 358, 2205–2217.
 21. DeLuca G., Suryapranata H., Ottervanger J.P., Antman E.M. Time delay to treatment and mortality in primary angioplasty for acute myocardial infarction. *Circulation*, 2004, 109, 1223–1225.
 22. Flynn A., Moscucci M., Share D., et al. Reducing door to balloon time in patients with ST-elevation myocardial infarction undergoing percutaneous coronary intervention: does a decrease in door to balloon time translate into a reduction in mortality? *Circulation*, 2009, 120, 472.
 23. Gibson S., Pride Y., Buros J., et al. Association of impaired thrombolysis in myocardial infarction myocardial perfusion grade with ventricular tachycardia and ventricular fibrillation following fibrinolytic therapy for ST-segment elevation myocardial infarction. *J. Am. Coll. Cardiol.*, 2008, 51, 546–551.
 24. Yellon D., Hausenloy D. Myocardial reperfusion injury. *N. Engl. J. Med.*, 2007, 357, 1121–1135.
 25. Goldberg R.J., Gurwitz J.H., Gore J.M. Duration of, and temporal trends (1994-1997) in, prehospital delay in patients with acute myocardial infarction: the second National Registry of Myocardial Infarction. *Arch. Intern. Med.*, 1999, 159, 2141–2147.
 26. Hasdai D., Behar S., Wallentin L. et al. A prospective survey of the characteristics, treatments and outcomes of patients with acute coronary syndromes in Europe and the Mediterranean basin; the Euro Heart Survey of Acute Coronary Syndromes (Euro Heart Survey ACS). *Eur. Heart J.*, 2002, 23, 1190–1201.
 27. Birkhead J.S., Walker L., Pearson M., et al. Improving care for patients with acute coronary syndromes: initial results from the National Audit of Myocardial Infarction Project (MINAP). *Heart*, 2004, 90, 1004–1009.
 28. Luepker R.V. Delay in acute myocardial infarction: why don't they come to the hospital more quickly and what can we do to reduce delay? *Am. Heart J.*, 2005, 150, 368–370.
 29. Kainth A., Hewitt A., Sowden A., et al. Systematic review of interventions to reduce delay in patients with suspected heart attack. *Emerg. Med. J.*, 2004, 21, 506–508.
 30. Cobb L.A., Fahrenbruch C.E., Olsufka M., Copass M.K. Changing incidence of out-of-hospital ventricular fibrillation, 1980-2000. *JAMA*, 2002, 288, 3008–3013.
 31. De Maio V.J., Stiell I.G., Wells G.A., Spaite D.W. Cardiac arrest witnessed by emergency medical services personnel: descriptive epidemiology, prodromal symptoms, and predictors of survival. OPALS study group. *Ann. Emerg. Med.*, 2000, 35, 138–146.

32. Nicod P., Gilpin E., Dittrich H., et al . Late clinical outcome in patients with early ventricular fibrillation after myocardial infarction. *J. Am. Coll. Cardiol.*, 1988, 11, 464–470.
33. Newby K.H., Thompson T., Stebbins A., et al. Sustained ventricular arrhythmias in patients receiving thrombolytic therapy: incidence and outcomes. The GUSTO Investigators. *Circulation*, 1998, 98, 2567–2573.
34. Mehta R.H., Harjai K.J., Grines L. et al. Sustained ventricular tachycardia or fibrillation in the cardiac catheterization laboratory among patients receiving primary percutaneous coronary intervention: incidence, predictors, and outcomes. *J. Am. Coll. Cardiol.*, 2004, 43, 1765–1772.
35. Volpi A., Cavalli A., Franzosi M.G. et al . One-year prognosis of primary ventricular fibrillation complicating acute myocardial infarction. The GISSI (Gruppo Italiano per lo Studio della Streptochinasi nell'Infarto miocardico) investigators. *Am. J. Cardiol.*, 1989, 63, 1174–1178.
36. Wu A.H., Parsons L., Every N.R., Bates E.R. Hospital outcomes in patients presenting with congestive heart failure complicating acute myocardial infarction: a report from the Second National Registry of Myocardial Infarction (NRMI-2). *J. Am. Coll. Cardiol.*, 2002, 40, 1389–1394.

Retrograde Approaches for Recanalization of Complex Infrainguinal Arterial Occlusive Disease

A.I. Pityk*

Institute of General and Emergency Surgery of the National Academy of Medical Sciences of Ukraine, Kharkov

The results of retrograde transpopliteal and tibial approaches for complex infrainguinal arterial occlusive disease are analyzed. The clinical report includes 30 patients with long femoropopliteal and tibial occlusions, who had retrograde recanalization after failed antegrade attempt. Technique of transpopliteal and tibial approaches, immediate results, complications, and reasons for technical failures are described.

Key words: endovascular intervention, retrograde approach.

* Address for correspondence:

Dr. Alexander Pityk

Institute of General and Emergency Medicine, National Academy of Medical Sciences of Ukraine

Balakirev passage, 1, Kharkov, 61018, Ukraine

Tel. +38057-934-36-77

E-mail: pitykalex@gmail.com

References

1. Bausback Y., Botsios S., Flux J., et al. Outback catheter for femoropopliteal occlusions: immediate and long-term results. *J. Endovasc. Ther.*, 2011, 18(1), 13–21.
2. Soder H.K., Manninen H.I., Jaakkola P. et al. Prospective trial of infrapopliteal artery balloon angioplasty for critical limb ischemia: angiographic and clinical results. *J. Vasc. Interv. Radiol.*, 2000, 11(8), 1021–1031.
3. Schmidt A., Scheinert D. Transpopliteal access. In: *Catheter-based cardiovascular interventions*. Ed. Lanzer P. Springer-Verlag. Berlin-Heidelberg, 2013, Chapter 24, 403–411.
4. Schmidt A., Scheinert D. Transpedal access. In: *Catheter-based cardiovascular interventions*. Ed. Lanzer P. Springer-Verlag. Berlin-Heidelberg, 2013, Chapter 25, 413–422.
5. Montero-Baker M., Schmidt A., Braunlich S. et al. Retrograde approach for complex popliteal and tibioperoneal occlusions. *J. Endovasc. Ther.*, 2008, 15(5), 594–604.
6. Tunnesen K.H., Sager P., Karle A., et al. Percutaneous transluminal angioplasty of the superficial femoral artery by retrograde catheterization via the popliteal artery. *Cardiovasc. Intervent. Radiol.*, 1988, 11, 127–131.
7. Fanelli F., Lucatelli P., Allegritti M., et al. Retrograde popliteal access in the supine patient for recanalization of the superficial femoral artery: initial results. *J. Endovasc. Ther.*, 2011, 18 (4), 503–509.

8. Yilmaz S., Sindel T., Ceken K. et al. Subintimal recanalization of long superficial femoral artery occlusions through the retrograde popliteal approach. *Cardiovasc. Intervent. Radiol.*, 2001, 24 (3), 154–160.
9. Schmidt A., Bausback Y., Piorkowski M. et al. Retrograde recanalization technique for use after failed antegrade angioplasty in chronic femoral artery occlusions. *J. Endovasc. Ther.*, 2012, 19 (1), 23–29.
10. Sangiorgi G., Lauria G., Flavio Airolidi F. et al. Retrograde popliteal access as bail-out strategy for challenging occlusions of the superficial femoral artery: A multicenter registry. *Catheter. Cardiovasc. Interv.*, 2012, 79 (7), 1188–1193
11. Iyer S.S., Dorros G., Zaitoun R. et al. Retrograde recanalization of an occluded posterior tibial artery by cutdown. *Catheter. Cardiovasc. Diagn.*, 1990, 20(4), 251–253.
12. Rogers R.K., Dattilo P.B., Garcia J.A., et al. Retrograde approach to recanalization of complex tibial disease. *Catheter. Cardiovasc. Interv.*, 2011, 77, 915–925.
13. Manzi M., Palena L.M., Cester G. Revascularization of tibial and foot arteries: below the knee angioplasty for limb salvage, angioplasty, various techniques and challenges in treatment of congenital and acquired vascular stenoses. Ed. Thomas Forbes, 2012, Chapter 10, 209–236.
14. Saito S. Different strategies of retrograde approach in coronary angioplasty for chronic total occlusion. *Catheter. Cardiovasc. Interv.*, 2008, 71, 8–19.
15. Jaffe R., Leung G., Munce N.R. et al. Natural history of experimental arterial chronic total occlusions. *J. Am. Coll. Cardiol.*, 2009, 53, 1148–1158.

The Use of Intravascular Diagnostic Techniques for Coronary Bifurcation Lesions

V.A. Ivanov^{1*}, S.A. Belyakin¹, A.V. Ivanov¹, V.V. Mayskov³, S.V. Permyakov, E.V. Tsymbal¹, I.S. Bazanov², S.B. Zharikov²

¹ A.A. Vishnevsky 3rd Central Military Clinical Hospital of the Ministry of Defence of the Russian Federation, Krasnogorsk, Russia

² Department of Hospital Surgery With Pediatric Surgery Course, Peoples' Friendship University of Russia, Moscow, Russia

³ City Clinical Hospital No. 64 of Moscow Healthcare Department, Moscow, Russia

Endovascular correction of coronary artery bifurcation lesions is currently one of the most thrilling problems. Modern intravascular diagnostic techniques are considered to be an effective instrument in achieving optimal immediate and long-term results. The article analyzes immediate results of percutaneous coronary interventions in patients with coronary artery bifurcation lesions whose fractional flow reserve was measured and whose target lesions were examined by intravascular ultrasound. According to study results, modern methods of intravascular assessment should be actively used to achieve the best clinical results.

Key words: coronary bifurcation lesions, intravascular ultrasound, fractional flow reserve.

* Address for correspondence:

Vladimir Aleksandrovich Ivanov

Federal State Clinical Institution A.A. Vishnevsky 3rd Central Military Clinical Hospital of the Ministry of Defence of the Russian Federation

Krasnogorsk, Arkhangelskoe postal department, 143420

Tel. +7-903-109-07-07

E-mail: ivanov-angio@yandex.ru

References

1. Movsesyants M.Yu., Ivanov V.A., Trunin I.V. et al. Selective strategy of stenting of coronary artery bifurcation stenoses. *Kardiologiya i Serdechno-sosudistaya Khirurgiya*, 2008, 6, 31–34. (in Russian)
2. Ivanov V.A., Belyakin S.A., Mayskov V.V. et al. Determination of myocardial revascularization strategy in CHD patients with multivessel coronary disease. *International Journal of Interventional Cardioangiology*, 2011, 24, 50.
3. Koo B., Kang H., Uoun T. et al. Physiologic assessment of jailed side branch lesions using fractional flow reserve. *J. Am. Coll. Cardiol.*, 2005, 46 (4), 633–637.
4. Medina A., Surez de Lezo J., Pan M., A new classification of coronary bifurcation lesions. *Rev. Esp. cardiol.*, 2006, 59 (2), 183–184.
5. Thomas M., Hildick Smith D., Louvard Y. et al. Percutaneous coronary intervention for bifurcation disease. A consensus view from the first meeting of the European Bifurcation Clab. *Eurointervention*, 2006, 2, 149.

Successful Staged Stenting of the Vessels from Different Cardiovascular Territories in a Female Patient with Multifocal Atherosclerosis at High Risk for Coronary Artery Bypass Grafting (clinical case)

D.G. Iosseliani, T.I. Yanushevskaya, A.S. Galaktionova, S.V. Rogan, R.Yu. Popov

Moscow City Centre of Interventional Cardioangiology; Department of Endovascular Methods of Diagnosis and Treatment

Faculty of post-Graduate Education for Medical Practitioners

Russian National Research Medical University named after N.I. Pirogov, Moscow, Russia

To date, the problem of optimal tactics of management for multifocal atherosclerosis is still a matter of dispute. Concomitant atherosclerosis of the renal and brachiocephalic arteries increases the risk of perioperative complications during CABG. Our experience is suggestive of the ample opportunities and effectiveness of endovascular interventions in high-risk patients with multivessel atherosclerosis.

Key words: multifocal atherosclerosis, staged stenting, high-risk surgery, multiple stenting.

*** Address for correspondence:**

Dr. Tatiana Yanushevskaya

Moscow City Centre of Interventional Cardioangiology, Moscow Healthcare Department

5, Sverchkov per., Moscow, 101000, Russia

Tel. +7 495-624-96-36

E-mail: yanush.tat@gmail.com

References

1. Das S., Brow T., Pepper J. et al. Continuing controversy in the management of concomitant coronary and carotid disease: an overview. *Int. J. Cardiol.*, 2000, 12, 74 (1), 47–65.
2. Rothwell P.M. The interrelation between carotid, femoral and coronary artery disease. *Eur. Heart J.*, 2001, 22 (1), 11–14.
3. Yanaka K., Meguro K., Noguchi Y. et al. Prevalence of carotid disease in patients with coronary artery stenosis. *Response. Stroke*, 1999, 30 (10), 2238–2248.
4. Versaci F., Reimers B., Del Guidice C. et al. Simultaneous hybrid revascularization by carotid stenting and coronary artery bypass grafting: The Sharp study. *J. Amer. Coll. Cardiol.*, 2009, 2, 393–401.
5. Naylor A., Cuffe R., Rothwell et al. A systematic review of outcomes following staged and synchronous carotid endarterectomy and coronary artery bypass. *J. Vasc. Endovasc. Surg.*, 2003, 25 (5), 380–389.
6. Iyer S.S., White C.S., Hopkins L.N. et al. BEACH Investigators. Carotid artery revascularization in high-surgical-risk patients using the carotid wallstent and filter wire: 1 year outcomes in the Beach Pivotal Group. *J. Amer. Coll. Cardiol.*, 2008, 51, 427–434.

7. Huh J., Wall M., Soltero E. Treatment of combined coronary and carotid artery disease. *Curr. Opinion in Cardiol.*, 2003, 18 (6), 447–453.
8. Revascularization versus Medical Therapy for Renal-Artery Stenosis. The ASTRAL Investigators. *N. Engl. J. Med.*, 2009, 361(20), 1953–1962.
9. Gromov D.G., Semitko S.P., Iosseliani D.G. Stenting of coronary arteries with small diameter (less than 3 mm): immediate and long-term results. *Ob'edinennyi meditsinskiy zhurnal (United Medical Journal)*. 2003, 1, 1622. (in Russian)
10. Marco J. et al. Coronary stenting in small vessels. *Guidant Cardiovascular Institute*. January 2001: 4.
11. Colombo A., Ferraro M., Itoh A. et al. Results of coronary stenting for restenosis. *J. Am. Coll. Cardiol.*, 1996, 28, 830–836.

A Clinical Case of Successful Closure of Post-Infarction Ventricular Septal Defect by Amplatzer Occluder on Day 4 from the Disease Onset

S.P. Semitko, V.P. Klimov, A.I. Analeev, I.M. Gubenko, S.D. Klimovskiy, N.S. Krylova, D.A. Egorov, S.P. Saprykin, Z.S. Shogenov, N.A. Karpun*

City Clinical Hospital No.81; Department of Diagnostic and Interventional Radiology
Cardiac Intensive Care Department, Moscow, Russia

A female patient with diabetes mellitus and acute transmural myocardial infarction complicated by cardiogenic shock caused by ventricular septum rupture, underwent successful closure of the defect with Amplatzer occluder on day 4 after the onset of the symptoms.

Key words: Infarction, myocardial rupture, closure of postinfarction VSD.

*** Address for correspondence:**

Dr. Serguey Semitko

City Hospital №81, Department of Endovascular Methods of Diagnosis and Treatment

Ul. Lobnenskaya, 10, Moscow , 127644, Russia

Tel. +7 926-244-57-26, +7 499-747-79-37

E-mail: semitko@mail.ru

References

1. Moreyra A.E., Huang M.S., Wilson A.C. et al. Trends in incidence and mortality rates of ventricular septal rupture during acute myocardial infarction. *Am. J. Cardiol.*, 2010, 106, 1095–1100.
2. Noguchi K., Yamaguchi A., Naito K., et al. Short-term and long-term outcomes of postinfarction ventricular septal perforation. *Gen. Thorac. Cardiovasc. Surg.*, 2012, 60, 261–267.
3. Birnbaum Y., Fishbein M.C., Blanche C., Siegel R.J. Ventricular septal rupture after acute myocardial infarction. *N. Engl. J. Med.*, 2002, 347, 1426–1432.
4. Thiele H., Kaulfersch C., Daehnert I., et al. Immediate primary transcatheter closure of postinfarction ventricular septal defects. *Eur. Heart J.*, 2009, 30, 81–88.
5. Crenshaw B.S., Granger C.B., Birnbaum Y., et al. Risk factors, angiographic patterns, and outcomes in patients with ventricular septal defect complicating acute myocardial infarction. GUSTO-I (Global Utilization of Streptokinase and TPA for Occluded Coronary Arteries) Trial Investigators. *Circulation*, 2000, 101, 27–32.
6. Menon V., Webb J.G., Hillis L.D. et al. Outcome and profile of ventricular septal rupture with cardiogenic shock after myocardial infarction: a report from the SHOCK Trial Registry. Should we emergently revascularize Occluded Coronaries in cardiogenic shock? *J. Am. Coll. Cardiol.*, 2000, 36, 1110–1116.
7. Piot C., Croisille P., Staat P. et al. Effect of cyclosporine on reperfusion injury in acute myocardial infarction. *N. Engl. J. Med.*, 2008, 359, 473–481.