

### Dynamics of Endovascular Therapy Department's work of Scientific Research Institute of Heart Surgery and Organ Transplantation, Bishkek, Kyrgyzstan

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#### Abstract

In recent years, high medical-social importance of most nosological types of cardiovascular diseases reflects an increase of surgery activity in this medical field. The enlargement of endovascular procedures is obvious and logical process. Today Endovascular therapy department of Scientific Research Institute of Heart Surgery and Organ Transplantation is one of the medical facility, where conducted scientific researches and new methods of diagnostics and treatment of vascular and cardiac diseases are being introduced.

**Key words:** endovascular procedures, cardiovascular diseases

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#### Introduction

The increase of cardiovascular diseases is associated with patient's age-related changes and prevalence of risk factors. In recent years, high medical-social importance of most nosological types reflects an increase of surgery activity in this medical field. The enlargement of endovascular procedures is obvious and logical process, because these methods are high-tech and safe.

Endovascular therapy department is one of the new departments of Scientific Research Institute of Heart Surgery and Organ Transplantation (SRIHSOT) was opened by order of the Ministry of Health of Kyrgyz Republic in 2008. Initially, catheterization laboratory angiographic equipment (Philips Integris 3000, release of 2001) was installed. In 2015 the overall reconstruction of department was finished and new digital angiographic equipment (Toshiba Infinix 8000

Vi) was installed, thereby expanding the variety of endovascular diagnostic and treatment procedures.

#### Dynamics of performed procedures

It is useful to note, in recent years, there has been a positive trend in the growth of therapeutic endovascular procedures, and in same time reducing diagnostic procedures (Table 1, 2). This dynamics suggest that selectiveness of diagnostic and endovascular methods applied in SRIHSOT is being increased. Also, there are positive trends to expand variety, quality and quantity of performed treatment procedures. Endovascular treatment department of SRIHSOT is on leading position in many species of procedures (stenting of aorta and large branches, balloon angioplasty and stenting of low extremities arteries) in comparison with similar departments in Kyrgyz Republic.

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**Table 1. Dynamics of performed diagnostic procedures**

Species of diagnostics procedures/ years	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Coronary angiography	77	142	131	95	163	146	70	230	235	150
Angiography and Aortography	27	77	105	58	34	3	5	8	6	31
Electrophysiological examination of the heart	48	14	10	0	0	0	0	0	0	30
Heart catheterization	1	0	0	0	0	0	2	11	16	15
Retrograde iliocavography	20	41	36	26	27	12	5	7	15	2
Percutaneous transhepatic cholangiography, drainage	0	21	5	15	46	11	15	47	157	43

**Table 2. Dynamics of performed therapeutic procedures**

Species of therapeutic procedures / years	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Coronary artery stenting	5	8	21	6	32	29	7	43	94	103
Balloon angioplasty and stenting of peripheral arteries	0	0	0	0	0	0	0	2	5	13
Stenting of aorta	0	0	0	0	0	0	0	1	1	4
Radiofrequency ablation of arrhythmias	41	14	10	0	0	0	0	0	0	30
Implantations of pacemakers, ICD, CRT-P(D)	50	46	50	31	85	99	64	92	98	52
Implantation of occluders, coils in septal CHD	1	0	1	0	0	0	0	0	1	15
Transcatheter valvuloplasty of pulmonary artery and aortic valves	0	0	0	0	0	0	0	0	4	4
Implantation of cava filters	0	35	35	26	26	12	5	7	15	24

### **Scientific activities of endovascular treatment department**

Among others, in the Endovascular therapy department of SRI, science activities is being conducted. Department staff participates in international congresses and conferences with presenting of their reports on various topics. In recent years, according to the results of conducted studies, at the SRI several articles were published, such as: «Endovascular treatment of chronic total occlusions of coronary arteries», «The results of different methods of myocardial revascularization in patients with acute coronary syndrome», «Optimal medical therapy in patients with acute coronary syndrome», «Immediate result of delayed percutaneous coronary interventions in patients with acute coronary syndrome», «Early clinical and angiographical outcomes of delayed percutaneous coronary interventions in acute coronary syndrome», «Dissection of descending aorta treated by stent-graft implantation in a patient with Marfan syndrome» (1 – 6).

### **Clinical cases**

Case 1. Female I., 32 years old presented with complains on back pain, exertional dyspnea, weakness, hypertension with maximal blood pressure - 190/100 mmHg. During examination the following diagnosis was established: Marfan syndrome, dissecting of aorta type III according to DeBakey's classification, hypertension. Recently David's

procedure was performed. Two stent grafts (Valiant Captiva, Medtronic, Ireland) were implanted in the descending part of the thoracic aorta, with the overlapping of the left subclavian artery (Fig. 1).

Case 2. Male A. 49 years old with diagnosis: Leriche's syndrome, chronic ischemia of right lower limb 3<sup>rd</sup> stage (Fontaine classification). Following the examination and preparation, was performed unilateral stenting in aortoiliac position (Protégé Everflex, EV3, Ireland). After that kissing- balloon dilatation was used in the ostia of both common iliac arteries. (Fig. 2).

Case 3. Male A. 77 years old, with diagnosis: diabetes mellitus, coronary artery disease, chronic ischemia of the right lower limb 4<sup>th</sup> stage (Fontaine). Computed tomography – angiography demonstrated critical stenosis of the internal carotid arteries on both sides. Earlier this patient underwent coronary artery stenting (three-vessel coronary artery disease) and balloon angioplasty of the right lower limb arteries. After diagnostic measures and preparation, stents were simultaneously implanted into the internal carotid arteries on both sides (Protégé RX, EV3, Ireland) (Fig. 3).

Case 4. Male A. 68 years old, with diagnosis: diabetes mellitus, chronic ischemia of the right lower limb 4<sup>th</sup> stage (Fontaine). Angiography demonstrated occlusion of the tibial arteries of the right tibia, after that balloon angioplasty was performed (Amphirion Deep, Medtronic, Ireland) (Fig. 4).

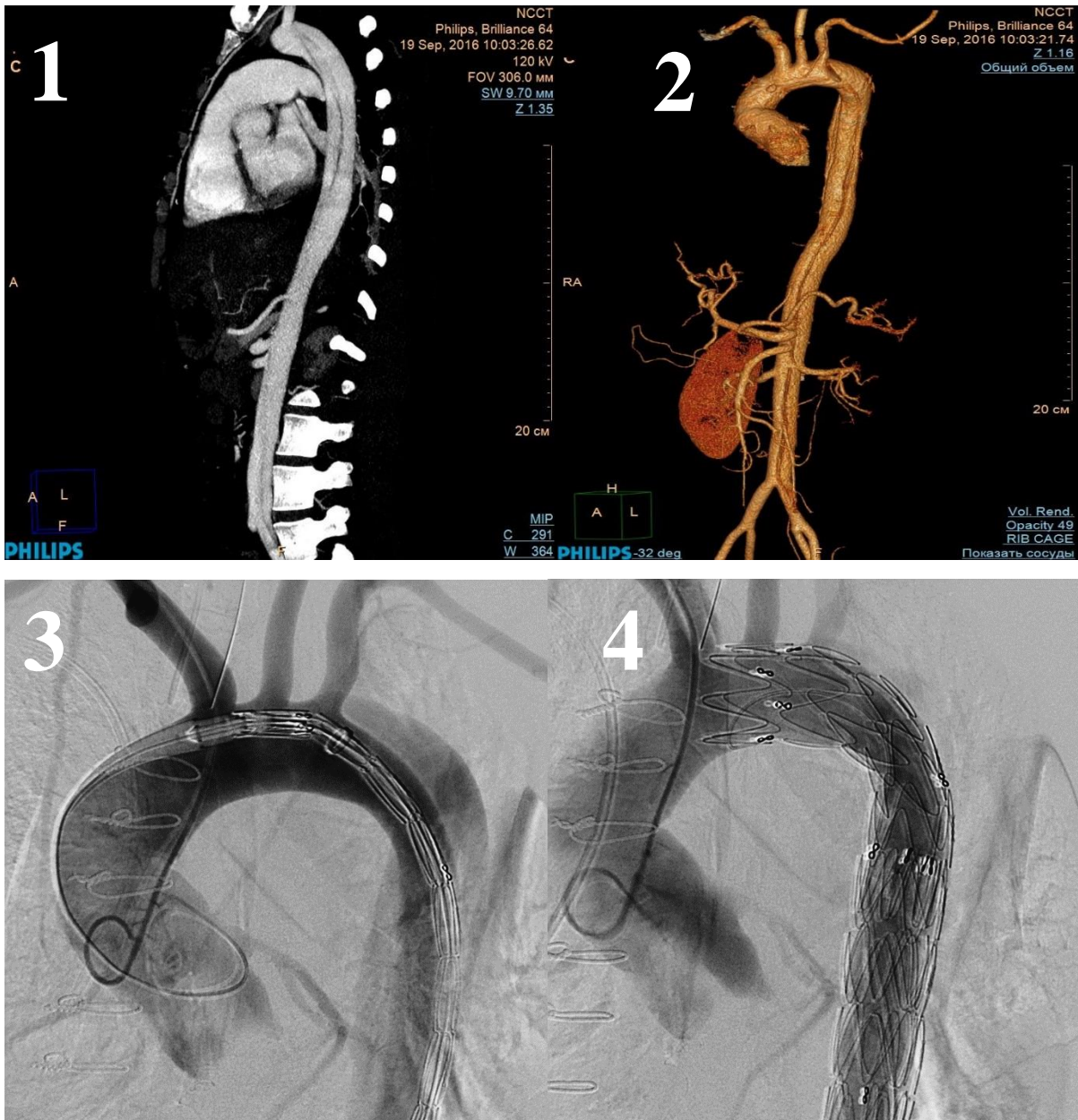


Figure 1. Implantation of two stent grafts in the thoracic region of the descending aorta. 1-2. Aortic dissection from the ostium of the left subclavian artery (CT-angiography). 3. Aortography and stent graft positioning. 4. Aortography after stent grafts implantation.

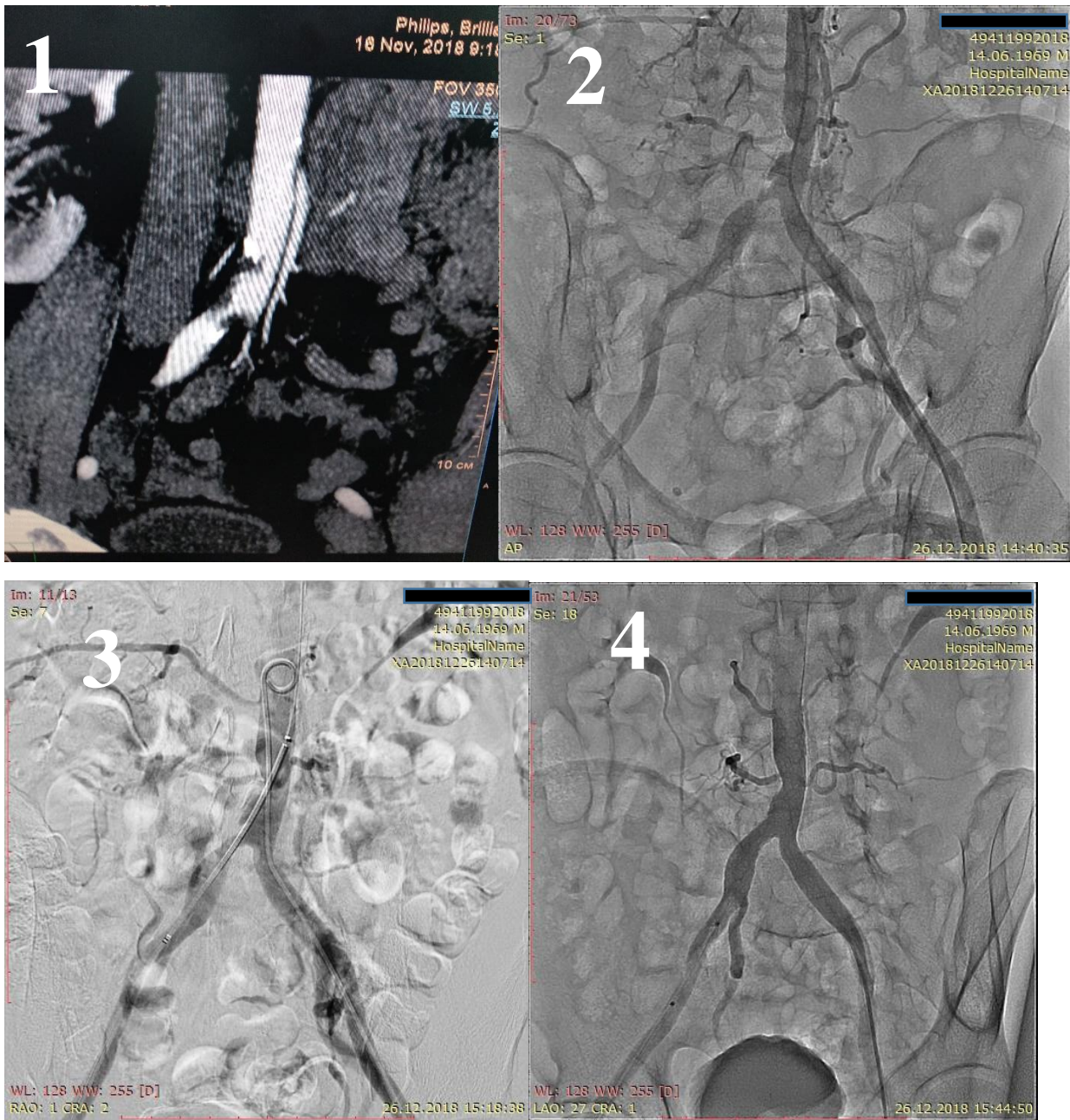


Figure 2. Implantation of the Protégé Everflex stent in the aortic - iliac position. 1.2. Significant lesions of the aorta and in the ostium of right common iliac artery. 3. Positioning the stent. 4. Condition after implantation

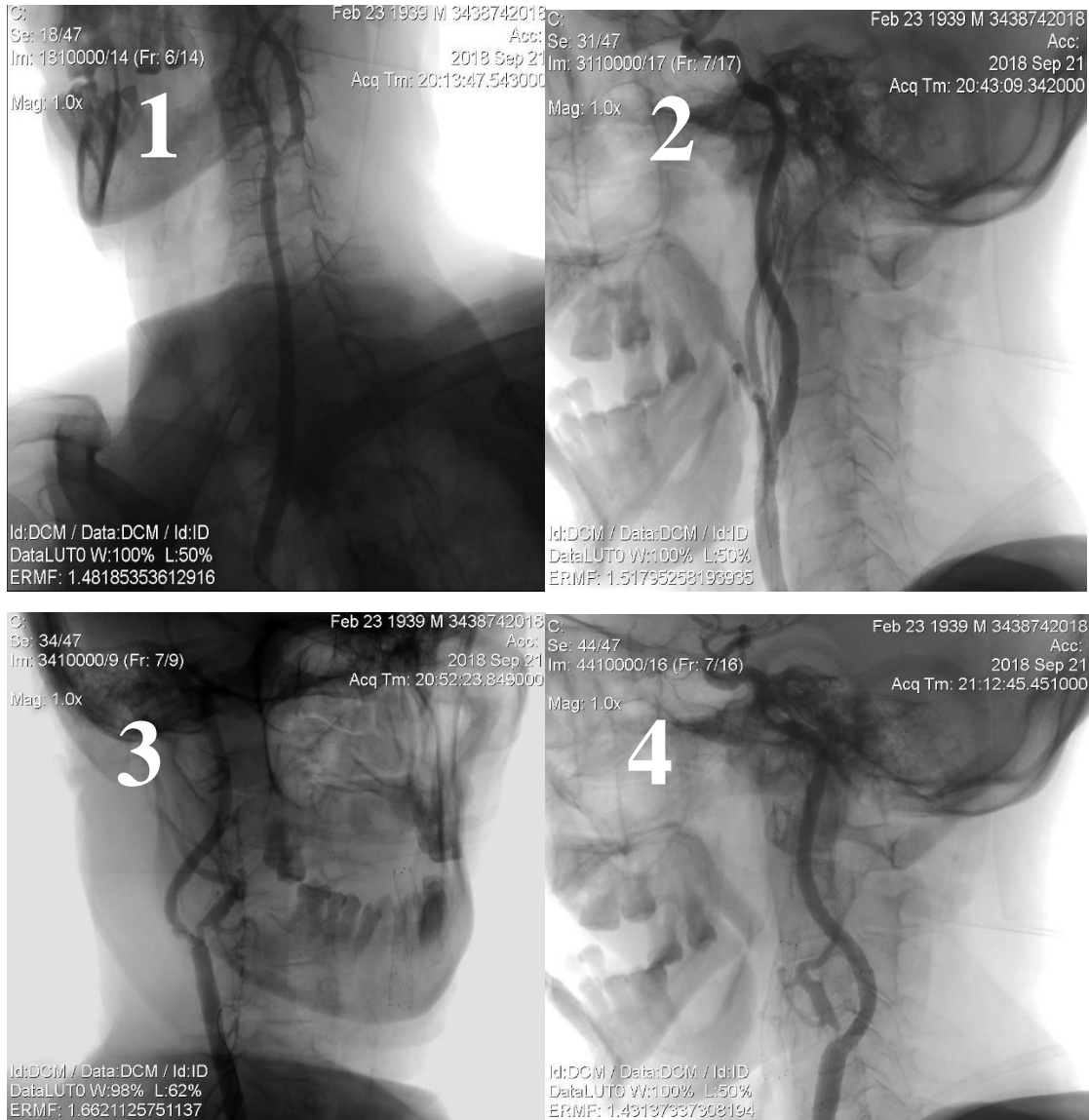


Figure 3. Implantation of Protégé RX stents into the internal carotid arteries on both sides. 1.2. Angiography before and after implantation (left side). 3.4. Angiography before and after implantation (right side).



Figure 4. Angiography of the tibial arteries and following angioplasty 1,2. Angiography before (occlusion of the anterior tibial artery, peroneal artery, posterior tibial artery). 3.4. Angiography after balloon angioplasty.

## Conclusion

Today Endovascular therapy department of Scientific Research Institute of Heart Surgery and Organ Transplantation is one of the medical facility, where scientific researches and new methods of diagnostics and treatment of vascular and cardiac diseases, arrhythmias, aorta's diseases and large branches, atherosclerotic diseases of peripheral arteries, venous pathology and congenital heart diseases are being conducted and introduced according to the world-class standards and achievements. In addition, the global experience is also tending to expand the number of minimally invasive procedures in cardiology, cardiac and vascular surgery.

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K.N. equally contributed to the study and  
preparation of manuscript

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