

KAZUISTIKY V ANGIOLOGII

42nd Czech Angiology Days

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42. Angiologické dny 2017

with Interantional Participation
s mezinárodní účastí

February 23 – 25, 2017
Prague, Czech Republic

Book of Abstracts



Vážené dámy a pánové,

je pro mne ctí, že Vás mohu jménem výboru České angiologické společnosti a všech dalších organizátorů přivítat na 42. Angiologických dnech v Praze.

Výroční sjezdy naší společnosti jsou každoročně příležitostí k tomu, abychom se ohlédlí za rokem, který uplynul od našeho předchozího setkání. Jeho odraz nacházíme v kongresovém programu.

V průběhu sjezdu například oceníme nejlepší práce s tematikou cévních onemocnění, publikované v roce 2016. V přímých přenosech z katetrizačních sálů budeme mít příležitost seznámit se s dalším vývojem v oblasti intervenční léčby aortálních onemocnění. Velký prostor bude věnován tradičním tématům, jako je žilní tromboembolismus, syndrom diabetické nohy, moderní postupy v léčbě varixů, periferních tepenných onemocnění. Uvidíme, jak probíhá výzkum vlivu mechanických srdečních podpor na periferní cirkulaci u pacientů se srdečním selháním. Získáme přehled o současném stavu a směřování péče o pacienty s ICHDK. Pozornost si zaslouží blok aktuálních vaskulárních témat z Mayo Clinic v USA. V italsko-české spolupráci proběhne sekce věnovaná aktuálním otázkám vyšetřovacích postupů u cévních onemocnění.

Zmíněná témata představují jen část z připraveného programu, který obsahuje řadu symposií, lekcí a každý den také ranní workshopy, věnované praktickým ukázkám a nácviku duplexní sonografie.

Mezi nejzajímavější části programu každoročně patří moderovaná posterová sekce. Neprobíhá ve formě plakátů, ale díky elektronické podobě, bezprostřední diskusi a komentářům autorů má zcela jinou úroveň a představuje více než plnohodnotnou část programu.

Neopomente ani aktuality poskytované na výstavě farmaceutických a zdravotnických firem, z nichž řada se podílí svým partnerstvím na uspořádání sjezdu.

Do Vašich mobilů a tabletů si můžete stáhnout aplikaci usnadňující přístup k abstraktům, umožňující vybírat části programu, které budete chtít absolvovat. Pro usnadnění diskuse pak bude možné podávat prostřednictvím mobilní aplikace dotazy přednášejícím.

Vážení přátelé, jsme rádi, že se s Vámi setkáváme na 42. výročním sjezdu České angiologické společnosti a přejeme Vám i sami sobě, aby to byl kongres po všech stránkách úspěšný!



Dear Ladies and Gentlemen,

It is an honor for me to welcome you on behalf of the Board of the Czech Society of Angiology and all other organizers to the 42nd Czech Angiology Days. Annual meetings of our society are always opportunities to look back on the previous year since our last meeting. Its reflection can be found in the scientific program.

During the congress we will for example award the best papers and books on vascular topics published in 2016. In the live broadcasts from catheterization labs, we will take the opportunity to acquaint ourselves with the latest developments in the field of aortic interventions. Substantial time and space will be dedicated to traditional topics such as venous thromboembolism, diabetic foot syndrome, modern approaches in the treatment of varicose veins and peripheral arterial disease. We will examine the advancements in research into the influence of mechanical circulatory support on peripheral circulation in patients with heart failure. We will also gain an overview of current trends in the care of PAD patients. A selection of presentations on up-to-date vascular topics from the Mayo Clinic will certainly deserve our attention. A session devoted to topical questions concerning examinations of vascular patients will be organized in Czech-Italian cooperation.

The above-mentioned topics represent just a fraction of the prepared scientific program, which consists of a host of symposia, lectures and also daily morning workshops dedicated to practical demonstrations and training in duplex ultrasonographic examination. One of the most interesting sessions will be the moderated poster session. Thanks to electronic posters, lively and immediate discussions, and comments by the authors, it has a very high standard and represents a fully-fledged part of the scientific program.

Please do not miss any of the topicalities presented at the exhibition of the pharmaceutical and medical devices industry, whose partnerships contribute to the successful organization of the congress.

Last but not least, I would like to draw your attention to the congress mobile application. It facilitates access to the abstracts, enables you to select sessions of your particular interest and create your own personal program, or put questions to the speakers.

Dear friends, we are happy to meet you at the 42nd annual meeting of our society, and we wish everyone involved a successful congress!

Karel Roztočil, Congress President



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Abstracts are published as they were received and are unmodified by the Program Committee of the congress.

LEFT VENTRICULAR THROMBUS PRESENTING WITH CARDIOEMBOLIC COMPLICATIONS

Bala P.¹, Pavlas I.¹, Zeman K.¹, Kološová R.¹, Jurenka D.²

¹Department of Internal Medicine, Hospital Frýdek-Místek, Czech Republic

²Department of Surgery and Traumatology, Hospital Frýdek-Místek, Czech Republic

Acute arterial embolism is a heterogeneous disease whose presenting features, treatment and outcome depend on the source of the embolism, the type of embolism and the affected target organ. Most arterial emboli originate in the left atrium or ventricle where they form due to structural or functional abnormalities. The most common sites for embolic events are brain circulation, and lower extremities. Early diagnosis and resulting revascularization has crucial impact on prognosis of patients. Diagnosis is based on searching for the site of ischemia and identification of the source of embolism. Arterial occlusions are detected by duplex sonography, digital subtraction angiography, computerized tomographic or magnetic resonance angiography. Cardiac sources of arterial emboli are diagnosed by transthoracic and transoesophageal echocardiography or cardiac magnetic resonance imaging. Treatment of thromboembolic events consists of immediate reperfusion through thrombolysis, embolectomy and sometimes through arterial bypass. Long-term management includes systemic anticoagulation to prevent additional emboli. We report the case of a 70-year-old woman presenting with cardioembolic complications of mobile left ventricle thrombus caused by subacute myocardial infarction. In history she was presenting with gastrointestinal bleeding associated with use of vitamin K antagonist and new oral anticoagulants. Thromboembolic complications were cardioembolic stroke and acute limb ischemia due to embolization to bifurcation of common femoral artery during transoesophageal echocardiography. Left limb was revascularized by Fogarty Arterial Embolectomy Catheter.

THE RESULTS OF LOCAL VENOUS THROMBOLYSIS

Brůhová H., Štěpánková L., Štěrbáková G.

University Hospital Plzeň, Czech Republic

The group of 48 patients (23 females, 25 males, 21–76 years old) who underwent the local venous thrombolysis due to deep vein thrombosis (DVT) is described. The most of cases were

DVT localized in pelvic and femoral veins, a small part of the group were DVT of subclavian vein. The local thrombolytic therapy lasted approximately 48–72 hours, exceptionally longer. The early results were good, some of the cases required PTA and stent implantation. The complications were rare.

ACUTE POSTPARTUM LIMB ISCHEMIA

Čermáková H., Roztočil K., Chlupáč J., Lipár K., Marada T., Janoušek L., Froněk J.

Department of Transplantation and Vascular Surgery, Institute for Clinical and Experimental Medicine, Prague, Czech Republic

Our case report describes the situation of the 41 years old women. She still had no internal diagnosis. Six days after a caesarean delivery and re-exploration for bleeding, pain in the left calf suddenly appeared. We had excluded deep vein thrombosis using ultrasound, but we found a reduction of ankle-brachial pressure index in the left leg. We diagnosed an acute thrombotic closure of the left common iliac artery and external iliac artery with distal embolization to the popliteal

artery using ultrasound and the CT. The severity of her acute limb ischemia was classified Rutherford 1-St. degree. We were looking for the cause of this condition. We didn't find a cardioembolic source and there was no sign of vasculitis. In addition, laboratory tests were without explanation. She underwent thrombectomy of the left pelvic arteries and then the course was obvious – involuntary ligation of the left common iliac artery instead of a branch of internal iliac artery. The problem was solved by surgical reconstruction of the common iliac artery.

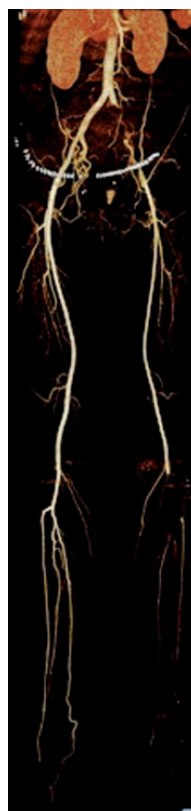


Fig.:
An acute thrombotic closure of the left common iliac artery and external iliac artery with distal embolization to the popliteal artery

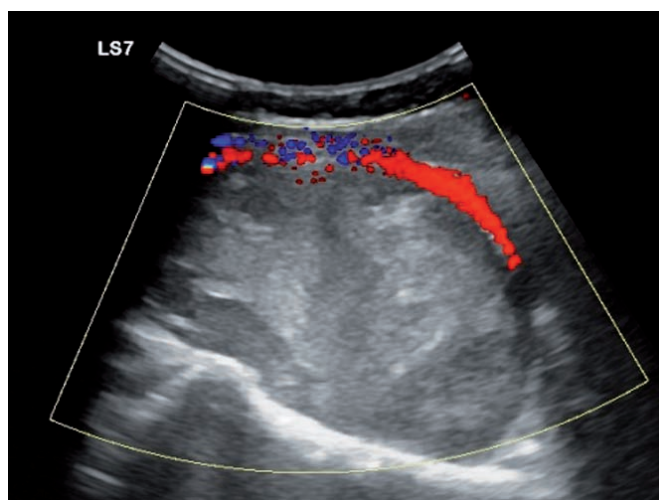
AN ATYPICAL CAUSE OF LEG SWELLING

Čermáková H., Roztočil K., Janoušek L., Froněk J.

Department of Transplantation and Vascular Surgery, Institute for Clinical and Experimental Medicine, Prague, Czech Republic

Our case report concerns 49 years old man. He pointed out in the 2013 year an asymmetric swelling of his right calf. It was not painful. Several times he went to the regional hospital doctor. Deep vein thrombosis was excluded several times. He had been diagnosed as a Baker's cyst and an orthopedic doctor left him without specific treatment except of rehabilitation.

At the beginning of the 2017 year he came to IKEM hospital. We found using an ultrasound under his knee a bearing formation (13 x 7 x 5 cm) seemed to be a tumor. The same was possible to see from the CT documentation. He underwent operative revision of his right calf with the aim of removing formation. Perioperative histology was unfavorable – liposarcoma. Now we are waiting for the definitive histology which will decide on further action.



³¹P MR SPECTROSCOPY IN PATIENTS WITH PERIPHERAL ARTERY OCCLUSIVE DISEASE

Dezortová M.¹, Šedivý P.¹, Drobny M.¹, Roztočil K.², Čermáková H.², Němcová A.³, Dubský M.³, Peregrin J.¹, Hájek M.¹

¹Department of Diagnostic and Interventional Radiology, Institute for Clinical and Experimental Medicine, Prague, Czech Republic

²Transplant Surgery Department, Institute for Clinical and Experimental Medicine, Prague, Czech Republic

³Department of Diabetes, Institute for Clinical and Experimental Medicine, Prague, Czech Republic

³¹P MR spectroscopy (MRS) is a powerful tool for the non-invasive investigation of muscular oxidative metabolism and its impairment done by ischemia in patients with peripheral artery occlusive disease (PAOD).

The ³¹P MRS examination at rest provides quantitative parameters that characterize the basal muscle metabolism. From dynamic ³¹P MRS data there can be calculated mitochondrial capacity (Q_{max}), phosphocreatine (PCr) recovery rate or pH changes during exercise.

Our goal was to describe changes in muscle metabolism caused by PAOD with and without diabetes and to find out if the method is applicable under clinical conditions for the disease evaluation.

Calf muscles of 19 PAOD patients (70±8 years, BMI 26.4±4.3 kg/m²) and 28 PAOD patients with diabetes (mean age 67±8 years, BMI 28.6±4.2 kg/m², TcPO₂ 26±12 mmHg) were examined together with a control group of 19 healthy volunteers (mean age 58±10 years, BMI 27.1±4.1 kg/m²). All the subjects provided their informed consent in line with local Ethical Committee rules.

³¹P MRS examination was performed at 3T MR system using a home built ergometer. Dynamic part consisted of 6 mins of plantar flexion (once per 2s, 7 kg weight) followed by 6 mins recovery. Signal intensity ratios of PCr/ATP, inorganic phosphate (Pi)/ATP, PCr/Pi, phosphodiester (PDE)/ATP and intramyocellular pH were estimated from the rest MR spectra. A drop of PCr and pH at the end of the exercise, PCr recovery rate and Q_{max} were calculated from the dynamic part of the examination.

In all patients, significantly lower Q_{max} and pH during exercise were found together with prolongation of PCr recovery rate after the exercise. The effect of diabetes was significantly pronounced at rest compared to controls and PAOD patients without diabetes. Thus, rest and dynamic ³¹P MR spectroscopy can be used for the description of severity of peripheral arterial occlusive disease.

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MEASUREMENT OF ANKLE-BRACHIAL INDEX – A NEW MODALITY OF PREVENTIVE EXAMINATION

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Peripheral arterial disease (PAD) is one of the possible manifestations of systemic atherosclerosis. The incidence of PAD is 5–10% of the population over 60. 15.1% of patients with PAD have also a severe coronary artery disease and 7.1% have serious cerebrovascular impairment.

The presence of PAD is determined by measurement of ankle-brachial index (ABI). The examination is simple, highly sensitive and specific, thus fulfilling the WHO criteria for screening. Pathologically reduced value of ABI confirms vascular etiology of leg pain and allows the assessment of disease severity.

Slovak Angiological Society of Slovak Medical Society and Slovak Society of General Practice have for years devoted to intensive education of general practitioners in ABI measurements. In 2009, they published the results of a pilot study: 24 general practitioners under supervision of 7 angiologists carried out ABI examinations in 2,207 consecutive patients older than 60 years. 67.4% of patients had normal ABI (0.9–1.2), 9.4% of patients had a decreased ABI (<0.9) and 23.2% of patients had increased ABI (> 1.2).

This study, numerous workshops and other educational activities resulted in the inclusion of ABI measurements by automatic devices to preventive examination (expanding the basic diagnostic armamentarium of practitioner consisting of medical history and clinical examination) carried out by general practitioners in the Slovak Republic in order to screen PAO and as well as to clarify cardio-vascular risk. General practitioner in the preventive examination (Dg Z 00.0) performs ABI measurement in patients with risk factors for over 50 years and in all over 60 years and it is covered by health insurance from 1st April 2016.

The general practitioner is a primary care physician who determines the dominant way and rate of health care. General practitioners must rationally dispose of ABI measurement results, to take responsibility in caring for patients with peripheral artery disease, how it holds, especially in the management of risk factors for atherosclerosis. After evaluating patient history, a careful clinical examination and measurement of ABI, consider consulting a specialist – angiologist. The aim is to prevent the development of critical limb ischemia, amputation on the one hand, and of fatal cardio-vascular events on the other.

IMPACT OF COMPULSORY AND EXTRA-CURRICULAR PHYSICAL ACTIVITY ON CARDIO-VASCULAR RISK FACTORS

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Introduction: Physical activity is an essential part of the development of young people. Project Respect for Health was focused on cardio-vascular risk factors in students. Project was organized by Public Health Authority Bratislava in the school of Petržalka district during the years 2011–2013. Students of the Faculty of Public Health Slovak Medical University in Bratislava actively participated in anthropometric measurements in the project.

Method: The target group consisted of 760 students (295 boys and 465 girls). Subgroup of 211 students (119 boys and 92 girls from 55 secondary schools in the Bratislava region aged 15–18 years) was analyzed in participation in compulsory physical education and extra-curricular sports. Data were collected by student questionnaire and the parents' questionnaire. We measured anthropometric parameters and blood pressure. Physical fitness was assessed by Ruffier test.

Results: 73% of students participated regularly in physical education, but 1/7 of students are consciously avoiding compulsory school physical education. Students who regularly participated in physical education are more physically fit compared to those who avoid it ($p=0.012$).

Students who spend more hours daily at computers are less physically fit ($p=0.02$). Obese students spend more time watching TV (2.8 h). Students smokers avoid physical education twice more than their classmates nonsmokers. This is an example of risk factors multiplication.

21% of girls compared to 5.7% boys avoid compulsory school physical education.

Students attending compulsory physical education are physically stronger than those who avoid compulsory school physical education for various reasons ($p=0.059$).

Obese pupils spent time watching television significantly more (2.8 hours/day) than at computer. BMI ($p=0.03$) rises with an increasing hours spent watching television. The number of students smokers who avoid compulsory physical education is twice higher compared to non-smokers in the group.

Conclusion: Participation in compulsory physical education at schools has a positive impact on the physical health and mental development of children and youth, it helps to create a positive habits to sport and physical activity.

EXTERNAL CAROTID ENDARTERECTOMY

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Background: Endarterectomy of external carotid artery (external CEA) has become a treatment option for patients with neurologic or ocular symptoms associated with a chronic ipsilateral internal carotid artery (ICA) occlusion and stenosis of external carotid artery within the carotid bifurcation.

Purpose: To present one case of external CEA and evaluate potential benefit of this procedure based on perioperative and late clinical outcomes published in available literature.

Case report and methods: A 65-year-old man had a coronary artery disease, diabetes, hypertension and hyperlipidaemia. Despite he suffered traumatic bilateral lower limb amputation in the past his quality of life was satisfactory. He presented with TIA in the region of left medial cerebral artery – expressive aphasia, central lesion of the right facial nerve and right upper extremity paresis. Duplex ultrasound and CTA proved bilateral chronic ACI occlusion; 80–90% left ACE stenosis and 70% right ACE stenosis. TCCS showed bilateral MCA hypoperfusion. Left sided external CEA was indicated. Endarterectomy with primary suture and ICA stump obliteration was performed. The postoperative course was uneventful. Duplex ultrasound one, four and nine months after the surgery proved good postoperative finding in the left ECA including normalised perfusion in left MCA. Nine months after the surgery the patient is symptom free.

Information about this case is presented together with that on the relevant publications obtained from EBSCO, PubMed, Science Direct, Ovid-Medline and UpToDate database.

Conclusions: External CEA may be beneficial in selected symptomatic patients with a chronic ipsilateral internal carotid artery occlusion and ECA stenosis within the carotid bifurcation.

External CEA seems to be feasible and safe and majority of patients had good clinical outcome in follow-up period. Obliteration of the ICA stump seems to be an important factor in prevention of restenosis and recurrent symptoms after external ECA. Our findings are limited due to a large heterogeneity and retrospective design of available studies with a small number of patients.

ANALYSIS OF RISK FACTORS OF STROKE IN FEMALES WITH ORAL CONTRACEPTIVES USE

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Introduction: Thrombotic diathesis has been a well known complication of oral contraceptive use for more than 50 years. Etiology is usually multifactorial and depends on a several additional risk factors.

The aim of the study: We analysed the role of inherited and acquired thrombophilia on the onset of stroke in 70 females in association with oral contraceptive use. We also assessed the presence of other risk factors (smoking etc.).

We have analysed following:

1. Frequency of inherited or acquired thrombophilia in the cohort of 70 females with stroke (ischemic stroke, TIA, CVT-cerebral vein thrombosis) in association with oral contraception.
2. Duration of COCs till thrombotic event, the assessment of additional eliciting RF with focus on smoking and the age at the time of thrombosis.

Materials and methods: Females were recruited in the period of 1997–2015 and most of them came from the Eastern part of the Czech Republic. All females took combined oral contraceptives (COCs). We took a family and personal history of thrombosis, and personal history of smoking habits.

Laboratory work-up contained: protein C, protein S, antithrombin, F V Leiden mutation, F II G20210A mutation, APS – lupus anticoagulans (LA), ACLa, anti beta₂/gly I antibody, homocysteine.

Results: Ischemic stroke attacked 13 females, TIA 17 females, and CVT 40 females. Thrombophilia was detected in 20 females (29%), inherited in 17 cases (24%), (F V Leiden 11x, F II G20210A 5x, 1x combined mutation). Acquired thrombophilia was identified in 3 cases (APS 2x, in one case incipient/early stage of polycythaemia vera, with JAK-2 kinase positivity). Concerning smoking, all 13 females with ischemic strokes were smokers (7 out of them were heavy smokers) and 75% of females with TIA also smoked. Among females with CVT, 10 were smokers. In 3 of them additional eliciting RF were identified (colitis ulcerosa, corticosteroids, surgery). The other risk factors were found rarely (DM, AH, dyslipidaemia in one case, always in females with ischemic stroke). Regarding type of sinus, in most of the cases multiple sinuses were affected (75% of cases) or isolated thrombosis in sinus sagittalis superior. At the time of thrombosis, none of women was on thromboprophylaxis with LMWH.



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Conclusion: In stroke even with CVT we have not found deficiency of natural inhibitors of coagulation (e.g. protein C, protein S and antithrombin). CVT has prevailed in comparison to ischemic stroke (iCMP + TIA) and increases frequency of F II20210a is in concordance with other study. All females with ischemic strokes had at least one additional risk factor. All were smokers (7 out of them heavy smokers), in 2 APS was detected and 3 females had either DM, or dyslipidaemia or AH. The frequency of thrombosis is further possible to decrease with keeping the rules before the prescription, healthy life style and type of contraception.

VISCERAL ISCHEMIA – A RARE BUT DANGEROUS DISEASE

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Vascular diseases of visceral arteries are relatively rare; their symptoms are misleading – that is why diagnosis is difficult. The unpaired visceral branches of the aorta have extremely rich collateral network, so the slowly developing obliterative disease may remain free of symptoms at long run. However, acute occlusions produce very dynamic clinical manifestation scarcely leaving sufficient time for diagnostic workup and treatment because of limited warm ischemic tolerance time of the affected organs.

Acute visceral ischemia may develop following embolism, trauma, arterial thrombosis, long segmental aortic dissection or rupture of aneurysm of the aorta or visceral arteries. In case of suspected visceral ischemia, immediate DSA or CTA is mandatory to confirm diagnosis. Specificity of laboratory signs is low.

Since tissue damage in acute GI ischemia starts at the most sensitive mucosa followed by function loss / necrosis of the muscular layer first bloody stool, then paralytic ileus presents. Continuing ischemic process of necrosis becomes transmural, the necrotizing serosa loses its barrier function and signs of peritonitis and endotoxin shock presents. If bowel ischemia is segmental in case of early diagnosis, resection of necrosed gut may save life. In case of extended bowel necrosis, mortality rate is as high as 80 pc.

If acute mesenteric ischemia is recognized in early phase, arterial reconstruction is possible and may save life.

Chronic GI ischemia may develop slowly, but due to thrombotic occlusion, they may turn into rapid progression. Other manifestations of atherosclerosis escorted by loss of body weight, increasing postprandial cramps, then signs of malperfusion, furthermore systolic bruit over the visceral arteries may call attention to the underlying disease.

That is why recognition of this subtle developing disease in time is very important, because revascularisation can treat the disease with success. In our lecture we present the experience that we have gained treating visceral ischemia.

COMPLEX TREATMENT IN TYPE B ACUTE AORTIC DISSECTION WITH VISCERAL AND LIMB ISCHEMIA

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Aortic dissection is an emergency condition with a high mortality rate. Sophisticated methods used in endovascular treatment are only one part of a series of important steps that should contribute to bringing the patient back to a worthwhile life. We present a case of a female patient with a type B acute aortic dissection with symptoms of severe ischemia of the visceral organs and lower extremities.

Case report: Patient, 40-year-old woman, admitted with type B acute aortic dissection with a total collapse of the true lumen with a dissecting channel located from the left subclavian area. The dissecting channel included the superior mesenteric artery, the right renal artery and left superficial femoral artery. Cardiothoracic surgeon and a vascular surgeon were consulted. Endovascular approach was recommended. The condition was resolved by implanting of a stent graft into the ascending aorta. The affected visceral arteries were treated by stent implantation and an extensive stenting reaching from the left external iliac artery towards to the proximal third of the superficial femoral artery was executed. After the procedure, the patient developed a severe ischemic-reperfusion syndrome with MODS and a transitional limb quadraparesis with left side prevalence with hemiplegia. Bilateral lower limb fasciotomy was necessary to perform due to the development of severe oedema. The fasciotomy was complicated with the paresis of the peroneal nerve on the left lower extremity. Diarrhoea with enterorrhagia, as a result of intestinal ischemia followed by *Clostridium difficile* infection was treated conservatively, with no indication for surgery given the local finding and a renewed perfusion. Renal failure in the pre-existing hypertensive nephrosclerosis potentiated by the use of a contrast agent and myoglobinaemia required a total of three haemodialysis followed by gradual renal function reparation to nearly physiological values. The initial neurological deficit with brain oedema responded well to antioedema therapy. MRI of the brain did not fully explain the plegic symptoms, which were probably caused by a sub-sided spinal cord ischemia. Comprehensive rehabilitation had a positive effect. The patient was dismissed in a good clinical condition with residual fibular nerve plegia to the care of her family.

TYPE II ENDOLEAK – IS IT NECESSARY TO TREAT?

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Objective: Endoleak is a common specific complication of the endovascular treatment of abdominal aortic aneurysm (EVAR). The most frequent type is type II endoleak (EL), which results from the retrograde flow from the patent aortic branches, usually from the lumbar arteries, inferior mesenteric artery, or middle sacral artery. While the management of type I and type III EL is active, controversy remains about the best strategy for the treatment of type II EL. There has been a change in the treatment strategy of type II EL. Currently, the majority of patients with type II EL is treated when the expansion of the aneurysm sac is 5 mm or more of the initial aneurysm size.

Aim: The aim of the study is to determine whether type II EL after EVAR is a benign condition.

Methods: Data from patients who underwent EVAR for atherosclerotic infrarenal aortic aneurysm between January 1995 and December 2015 at Na Homolce Hospital, Vascular Surgery Department, were retrospectively collected. Acute, inflammatory, infected and ruptured aneurysms were excluded from the study. Data regarding endoleak time point, number of aortic branches involved, aneurysm sac expansion, intervention and outcome were assessed.

Results: There were 126 patients included. Follow-up ranged from 6 to 67 months (median 56 months). Type II EL occurred in 22 patients (17.5%) at one month after EVAR, and persisted in 12 patients (9.5%) at 6 months after the procedure. Five of these 12 patients had regression of aneurysm sac diameter despite the persistent EL. Three patients demonstrated no increase of the sac diameter and remained under observation. Only four patients (3.2%) showed an enlargement of the sac and required reintervention, two of them required conversion to open repair. There were no ruptured aneurysms or aneurysm-related deaths during the follow-up. In the group of 4 patients with type II EL, two had anticoagulation and other two were on dual antiplatelet therapy due to concurrent diseases.

Conclusion: The number of necessary reinterventions for type II EL is low. In our cohort, reinterventions were needed only in patients with type IIb EL, who were treated with anticoagulation or dual antiplatelet therapy.

OFF-LOADING IN PATIENTS WITH THE DIABETIC FOOT AND PERIPHERAL ARTERIAL DISEASE IN POSTOPERATIVE CARE

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Off-loading is one of the crucial components of diabetic foot (DF) therapy. It is still not determined which off-loading device is the most effective and safe in patients with the DF and peripheral arterial disease (PAD) in postoperative care. The **aim** of our study was to compare the safety and the effect of different off-loading devices on the healing and postoperative complications in patients with the DF and PAD after surgical procedures. **Methods:** 139 patients with the DF and PAD, who underwent foot surgery (mean age 66.7±9.6 years, diabetes duration 22.8±12.7 years, BMI 29.1±4.8 kg/m², HbA_{1c} 59.7±14.5 mmol/mol) and were treated only by one type of off-loading device, were enrolled into our observation study. Patients were followed until healing or for at least 3, maximally up to 12 months. Based on the type of off-loading (chosen empirically), patients were divided into 6 groups that we compared in terms of patient characteristics and therapy outcomes (percentage of healed patients and their healing time, duration of antibiotic therapy, number of reamputations, major amputations, rehospitalisations and their length).

Results: 6.5% of patients were treated by orthopaedic shoes (group S), 21.6% by half-shoes (group H), 40.3% by wheelchairs (group W), 10.1% by the combination of wheelchairs and removable contact splints (group WR), 12.9 % by wheelchairs and half-shoes (group WH) and 8.6% of patients by wheelchairs and orthoses (WO group). The study groups did not differ significantly in basic characteristics including osteomyelitis, TcpO₂ and the number of revascularizations. Significantly more healed patients were found in WR group, similarly as in group H and S (85.7%, 80% and 88.9%, respectively; p=0.04). There was also a positive trend to shorter healing time (15, 14.1 and 10.3 weeks, respectively; p=0.03) and to lower numbers of reamputations (0.21, 0.37 and 0.11/1 patient; p=0.09) in these cohorts in contrast to other study groups. The numbers of major amputations did not differ significantly between the study groups. The lowest numbers of rehospitalizations (0.36, 0.37 and 0/1 patient; p=0.01) and their shortest length (3, 2.6 and 0 days on average; p=0.003) were found in WR, H and S groups. Antibiotics were used for the shortest time in group S in contrast to other groups (p=0.02). **Conclusions:** Orthopaedic and half shoes indicated for small surgical procedures and combinations of wheelchairs and

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removable contact splints for larger surgery are the most effective and safe off-loading devices for patients with the DF and PAD that accelerate healing processes, reduce healing time and decrease postoperative complications.

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DIAGNOSIS OF PULMONARY ARTERY EMBOLIA (EAP) AND THE PHLEBOTHROMBOSIS (ORIG) IN DISTRICT HOSPITAL CONDITIONS

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Prim. MUDr. Gergely from Levice has presented a 85,9% ORIG verification success rate with already diagnosed EAP on the XXIV Angio congress in Tatra on 23rd September 2016 which seems disproportionately high to me.

1. We have performed 389 CT pulmonary angiographies in order to investigate the EAP appearance during 2013, 2014 and 2015. The EAP could have been proved in 67 cases which makes 17,2%. The group of patients with EAP is statistically significant.
2. We have encountered 6 exitus lethalis from the 67 patients group with EAP verified who have been hospitalized. The 6% lethality is statistically significant.
3. 47 patients (70%) from the EAP verified group have undergone a USG to confirm OTIG. 20 patients (30%) have not been subject to USG. Share of patients with USG is statistically significant.
4. 27 cases (40%) have been classified as massive EAP (MAS), 27 cases (40%) as segmental EAP (S), 13 cases (20%) as small EAP (D). All within the 67 verified EAP group. MAS and S occurrence is statistically significant.
5. 26 patients (55%) have been diagnosed with ORIG whereas 21 (45%) has not been. All from the 47 patients group which has been subject to ORIG investigation. The significance level of ORIG confirmation is 0,05.
6. 23 patients (49%) from the ORIG investigation group have been classified as MAS, 18 patients as S (38%) and 6 patients (13%) as D. Share of MAS patients from the USG group is statistically significant.
7. There have been 11 patients (48%) within the 23 MAS group with no ORIG confirmation. 9 patients (39%) with identified FP phlebothrombosis and 3 patients (13%) with crural phlebothrombosis. Share of patients with non-identified phlebothrombosis out of the 23 verified EAP patients group with ORIG investigation and MAS confirmation is on 0,005 significance level.
8. ORIG could not be confirmed with 8 patients (44%) suffering S EAP with ORIG investigation. FP 7 times (39%) and

crural 3 times (17%). Share of patients with non identified ORIG from the S EAP group with ORIG investigation is on 0,05 significance level.

9. 3 patients (50%) from the D EAP group have been diagnosed with vena poplitea (VP) phlebothrombosis. 2 patients (33%) with unconfirmed ORIG and 1 patient (17%) with crural phlebothrombosis. The share of ORIG identified VP patients with D EAP is statistically significant.
10. Prim. Gergely has provided higher ORIG identification rate than Dr. Fric.

Conclusion:

- I. The ORIG phlebothrombosis verification within EAP confirmed patients has been on a 0,05 significance level.
- II. The EAP MAS has been the statistically significant form with most occurrences.
- III. The ORIG non identification within MAS and S EAP ORIG group has been on the statistical significance threshold with 0,05 significance level.

MEDIAL ARTERIAL CALCIFICATION – MARKER OF INCREASED CARDIOVASCULAR RISK

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Introduction: Decreased ankle-brachial pressure index (ABI) is a well-known marker of increased cardiovascular mortality. However, also the values of ABI 1.3 and more, typical in medial arterial calcification (MAC), are associated with increased cardiovascular and all-cause mortality.

Aim of the study: To determine the prevalence of cardiac arrhythmias and myocardial ischemia in a group of patients with type 2 diabetes mellitus and MAC.

Materials and methods: 41 patients with T2 DM (25 males and 16 females), mean age 59±8 years were investigated. MAC with ABI at least 1.3 was present at all members of our group. Arterial hypertension was present in 35 patients (85.3%), history of MI in 8 patients (19.5%) and history of stroke was present in 7 patients (17. 1%). Holter monitoring with an average duration of recording 22.36 hours was carried out by GE-Marquette MARS PC-ambulatory ECG Holter system (USA).

Results: Normal Holter ECG records without ischemia or arrhythmias were present in 19 patients (46.3%). Complex forms of arrhythmias were in 18 patients (43.9%), Lown III B in 12 patients and Lown IV A in 6 patients. Atrial fibrillation was present in 6 patients (14.6%) and myocardial ischemia was present in 10 patients (24.4%).

Conclusion: Patients with medial arterial calcification are threatened by serious cardiac complications, such as cardiac arrhythmias and myocardial ischemia. We have found high incidence of cardiac arrhythmias, including complex forms, and also myocardial ischemia during Holter ECG monitoring. Holter ECG monitoring in patients with MAC is highly recommended, since subsequent management can improve their prognosis.

MEDIAN ARCUATE LIGAMENT SYNDROME

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Background: Median arcuate ligament syndrome (MALS), also known as Dunbar syndrome, is a rare entity caused by compression of the coeliac artery by the median arcuate ligament of the diaphragm. In symptomatic patients, several treatment options have been proposed: coeliac sympatectomy,

surgical release of the coeliac artery, or bridging of the stenotic segment.

Aim: To show whether sole release of the coeliac artery results in sufficient resolution of the stenosis measured by systolic pressure gradient.

Patients and methods: Between 2004 and 2016, 10 patients (6 males) diagnosed with MALS underwent an open surgical repair of the coeliac artery stenosis. Pressure gradient between the left radial artery and the left gastric artery was measured invasively before and after the release of the coeliac artery. Because the gradient did not drop below 15 mmHg, in all the patients an aorto-coeliac or aorto-hepatic bypass was performed.

Results: The release of the coeliac artery resulted in insufficient decrease in the pressure gradient, but after subsequent construction of a bypass using a reinforced PTFE graft (diameter, 6 mm) the gradient decreased below 15 mmHg in all patients. Follow-up CT angiography one month after the procedure showed good patency of the bypass. All patients were symptom-free 6 months after the operation and there was no mortality associated with the procedure.

Conclusion: The sole release of the celiac artery was insufficient to fully restore its patency and bridging of the diseased segment was required in all of the patients. We believe that this is a result of arterial wall fibrosis caused by its entrapment by

the median arcuate ligament. Surgical treatment of the median arcuate ligament syndrome is a safe procedure with good outcome.

GYNAECOLOGIC BLEEDING IN WOMEN OF REPRODUCTIVE AGE TAKING NON-VITAMIN K ANTAGONIST ORAL ANTICOAGULANTS FOR VENOUS THROMBOEMBOLISM

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Non-vitamin K antagonist oral anticoagulants (NOAC) have been implemented in clinical practice recently. One of their indications is the treatment and secondary prevention of venous thromboembolism (VTE). In comparison with vitamin K antagonists (VKA) NOAC have been reported to have non-inferior efficacy and a better safety profile. They reduce the incidence of major bleeding, especially that of intracranial bleeding. However, NOAC seem to increase the intensity of menstrual bleeding. Many women with VTE can be affected by this complication. The estimated incidence of VTE in females in reproductive age is 1–10 per 10 000 women/year and the duration of anticoagulation in VTE patients range from three months to lifelong treatment. Women taking anticoagulants suffer from both increased duration and volume of menstrual bleeding. Heavy menstrual bleeding negatively affects the quality of woman's life and frequently necessitates medical consultation or even intervention. However, there are only limited data about gynaecologic bleeding in women of reproductive age on NOAC. For dabigatran, the relative risk of gynaecologic bleeding in premenopausal women is unknown. For direct oral factor Xa inhibitors, the data from observational studies and post-hoc analyses of clinical trials suggest a higher risk of heavy menstrual bleeding than for VKA.

Real practice data also confirm that gynaecological bleeding is a common complication in women of reproductive age taking oral factor Xa inhibitors.

Several preventive and therapeutic strategies are suggested in the literature. Prior to the choice of anticoagulant in women, physicians should assess the reproductive status, ask for menstrual bleeding pattern, discuss the possibilities and inform patients in details about the risks. Continuing oral contraceptive therapy along with anticoagulation is also an option, though quite controversial. Especially levonorgestrel intrauterine system (LNG-IUS) seems very promising in this indication. A close cooperation with a gynaecologist is important. Potential underlying structural abnormalities increase the risk of menorrhagia, the risk of its recurrence and the severity of bleeding. Most cases of NOAC-associated menorrhagia can be managed conservatively, e.g. by temporary interruption of anticoagulation, change of the type or dose of anticoagulants, start or change of hormonal therapy.

IS IT POSSIBLE TO TREAT ENORMOUS DILATED TRUNCAL VEINS WITH RADIOFREQUENT INDUCED THERMOTHERAPY (RFITT)?

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Introduction: The RFITT method has been applied to clinical practice since 2006. The main indication of this intervention is the reflux elimination in a truncal vein. The maximal diameter for an effective thermal ablation is up to 25 mm according to guidelines of this method. However, not only according to our experience but also according to other clinical studies, the effectiveness of RFITT is dependent on the diameter of a treated vein.

Goal: The goal of this study is to evaluate different modifications of RFITT used in veins with a diameter bigger than 15 mm.

Material and methods: 286 interventions with 1-year follow-up were included in this study. All cases were divided into three groups according to their specific modification of the operation methodology. In the first group, there were patients where only RFITT was used for treatment. The second group were patients with RFITT and foam-sclerotherapy that was added after RFITT was completed. In the third group, foam-sclerotherapy was applied after tumescent infiltration but before the thermal ablation. The strongest concentric contraction of the vein and lumen reduction were expected in this situation. This reaction was caused by compression of the vein with tumescent liquid and then due to vasospasm that was induced by released endothelin 1 after sclerosing foam application.

Results: The effectiveness of RFITT – group 1) 84.62%, group 2) 89.29% and group 3) 90.62%. There was no significant difference between all groups. In group 1, Endothermal heat-induced thrombosis (EHIT) level 4 and 5 was in 5 from 130 described cases – 3.83%. In group 2, this complication was described only in 1 from 84 cases – 1.19%. There was no such a complication in group 3. Another diagnosed complication after the intervention was thrombosis of the perforating vein. It was in group 2 – 3.57%, in group 3 – 5.19%. In all situations a higher volume of the foam was used – 5–7 ml of foam applied into the stem vein.

Conclusions: The combination of the RFITT and foam-sclerotherapy increased the effectiveness in case of endovascular thermic treatment of a more dilated vein.

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POSTPRANDIAL MICROVASCULAR REACTIVITY IS SIGNIFICANTLY MODIFIED BY ENDOGENOUS INSULIN IN RECENTLY DIAGNOSED TYPE 2 DIABETIC PATIENTS

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Aim: To analyze factors modifying microvascular reactivity (MVR) in postprandial state in early Type 2 diabetes (T2DM).

Methods: Twenty patients with T2DM (58±6 yrs, T2DM 2.3±1.3 yrs, metformin only) and 14 control subjects (CON) were examined at fasting and 60 (T60) and 180 (T180) minutes after standard breakfast. MVR was measured by laser Doppler flowmetry during post-occlusive hyperemia (PORH) at fingertip and thermal hyperemia (TH) in the forearm. Lipids (total, LDL- and HDL-cholesterol, triglycerides), HbA_{1c}, glucose and insulin levels were evaluated.

Results: Postprandial glucose was higher in T2DM vs. CON. Insulin was non-significantly higher in T2DM vs. CON. Negative correlations were found at fasting between HbA_{1c}, glucose and the perfusion at forearm. A weak positive correlation between MVR at fingertip and insulin led us to further analysis. We divided the patients into tertiles based on their insulinemia in T60. The insulin in the low tertile (LOW) was 68±7 mU/L, in medium (MED) 103±21 mU/L and in the high (HIGH) 219±53 mU/L (p<0.003). Basal fingertip perfusion at T60 and T180 was higher in HIGH vs. LOW tertile (181±78 vs. 72±57 PU, p=0.014 and 134±46 vs. 76±50 PU, p=0.048). PORH at T60 and TH at T180 was higher in the HIGH vs. LOW tertile (255±59 vs. 156±93 PU, p=0.030 and 158±52 vs. 85±33 PU, p=0.012). TH at T180 was higher also in HIGH vs. MED tertile (158±52 vs. 88±33 PU, p=0.015). No differences in MVR were found between LOW and MED. Although insulin was higher in HIGH tertile compared to CON (219±53 vs. 118±58 mU/L, p<0.001), PORH after meal still remained significantly lower in HIGH tertile vs. CON. Oppositely, TH at T180 was higher in the HIGH vs. CON (158±52 vs. 109±48 PU, p=0.045).

Conclusions: Low endogenous insulin levels were associated with impaired endothelium dependent MVR in recent T2DM. Further research should clarify whether insulin treatment restores MVR which would support early use of insulin treatment in the clinical practice.

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CATHETER-BASED ENDOVENOUS LASER ABLATION IN THE TREATMENT OF VENOUS REFLUX – RESULTS OF A SINGLE CENTER OBSERVATIONAL STUDY OF AN UNSELECTED PATIENT POPULATION

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Introduction: Catheter-based endovenous laser ablation (EVLA) is a common alternative to surgery and is slowly becoming a state of the art method in the treatment of varicose veins.

Aim: The aim of this observational study was to determine whether EVLA is safe and feasible in an unselected population of patients and if it may be used in more vein segments in a single procedure.

Methods: From February 2010 to March 2016 EVLA was performed in 1 209 venous segments in 1 117 consecutive patients (74% women) with venous reflux. Mean diameter of ablated segments was 8.5 mm (range 5–25 mm). All procedures were performed on an out-patient basis using local tumescent anaesthesia. Intraoperative sonographic guidance was mandatory.

Results: Early closure was successful in 98.8% of the treated segments. Early non-closure occurred in 9 patients (15 treated segments) and all were successfully resolved by early re-EVLA. The causes of incomplete closure were related to the commonly known risk-factors (anticoagulation therapy, history of varicophlebitis) and presumably to the learning period. The non-closure events were not associated with venous diameter. A prolapse of thrombus into the lumen of deep femoral vein was noted in 6 patients (EHIT – Endovenous heat induced thrombosis). All cases were resolved after one week of treatment with low molecular weight heparin. Low-risk pulmonary embolism was observed in a single non-compliant patient.

Conclusion: EVLA of the great saphenous vein, small saphenous vein and large tributaries in the treatment of symptomatic reflux is a feasible, safe, effective and reproducible method. The closure of venous segments was performed without limitation in diameter and amount of segments.



**KAZUISTIKY
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COMMON POLYMORPHISMS AS STRONG PREDICTORS OF HYPERTRIGLYCERIDEMIA IN CZECH POPULATION

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Introduction: Hypertriglyceridemia (HTG) is a common lipid disorder. It is supposed, that really high plasma levels of triglycerides (over 10 mmol/L) have strong genetic background. Rare mutations within the genes for LPL, APOA5, APOC2, GPI-HBP1 and LMF1 explain some cases, but in majority of the patients, the disease seems to be polygenic. Accumulation of risky alleles can lead to the increased disease penetrance.

Methods: Using PCR-RFLP we have analysed common polymorphisms within the genes *APOA5* (rs96484), *FRMD5* (rs2929282), *GCKR* (rs1260326), *CAPN3* (rs2412710) and *TRIB1* (rs2954029) in 145 patients with plasma TG values over 10 mmol/L and 515 control subjects with plasma TG below 1.8 mmol/L.

Results: In all cases, we have found highly significant risk (all $p < 0.01$) of hypertriglyceridemia development associated with the minor alleles of the above-mentioned SNPs. The risky alleles increased the risk (OR, 95% CI) of HTG for 1.62 (1.09–2.40; *TRIB1*), 2.74 (1.19–6.33; *CAPN3*), 2.56 (1.64–4.00; *GCKR*) and 2.05 (1.19–3.53; *FRMD5*). The extreme association has been observed in the case of the *APOA5* gene, where the GG homozygotes exhibit more than 15-times higher risk to develop HTG (OR 15.16, 95% CI 6.40–36.04; $p < 0.000001$). The mean of the risky alleles per person was 1.03 in HTG group vs. 0.48 in controls ($p < 0.01$).

Conclusion: Our results clearly confirm that the common SNPs in distinct genes are strong predictors of the HTG development.

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ANGIOPLASTY/STENTING OF EXTRA-CRANIAL ARTERIES FROM SURGICALLY EXPOSED COMMON CAROTID ARTERY

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Introduction: Balloon angioplasty/stenting is a well established method for revascularization of primary lesions of supra-aortic arteries and re-stenosis of extra-cranial arteries.

Percutaneous femoral puncture in the groin is predominantly used for intra-arterial access. If this is unfeasible, alternative puncture of surgically exposed common carotid artery may be performed.

Aim: Retrospective evaluation of single-centre case series of angioplasty/stenting of extra-cranial vessels performed from surgically exposed arteries.

Methods: Six patients at mean age 73 ± 10 years (58–81 years) were treated by antegrade angioplasty/stenting of internal carotid artery ($n=3$) or retrograde angioplasty/stenting of left common carotid artery or brachio-cephalic trunk ($n=3$). Three patients were neurologically symptomatic; 3 patients were asymptomatic. Groin access was either anatomically impossible or previously unsuccessful. Procedures were performed using puncture of surgically exposed common carotid artery ($n=5$) or common femoral artery ($n=1$).

Results: Technical success rate was 100%. There was no periprocedural cerebro-vascular event (≤ 30 days). One patient sustained worsening of pre-existing chronic renal dysfunction, one patient sustained infection of femoral prosthetic patch, which was replaced by auto-venous patch. Four of six patients died of unrelated causes 2, 6, 7 and 46 months after procedure, respectively. One patient was lost to follow-up. One surviving patient suffered from in-stent occlusion of brachio-cephalic trunk 2 years after the procedure resulting in repeated symptomatic subclavian steal-carotid recovery syndrome. He was managed by right-sided carotid-subclavian bypass.

Conclusion: balloon angioplasty/stenting of extra-cranial arteries from surgically exposed common carotid artery is feasible alternative approach when the femoral puncture is impossible. Life expectancy should be considered in this morbid population.

V.A.C. THERAPY FOR INFECTION OF VASCULAR PROSTHESIS: SINGLE CENTER EXPERIENCE

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Introduction: Infection of synthetic vascular prosthesis is a serious complication. Graft excision may be a complicated redo surgery. Negative pressure wound therapy (Vacuum assisted closure, V.A.C.) is controversial. Life-threatening complications are feared in such cases.

Aim: Retrospective evaluation of the efficacy and safety of the V.A.C. therapy as a primary treatment of prosthetic graft infection.

Methods: Twenty-six patients at mean age 65 ± 9 years (32–82 years) were treated using V.A.C. for deep prosthetic infection between January 2009 – December 2016. Early infection (≤ 30 days) occurred in 62%. Exposed anastomosis was observed in 64% of patients.

Results: Mean hospital stay was 19 ± 14 days (9–52 days), mean duration of the V.A.C. therapy was 10 ± 6 days (3–31 days) and mean follow-up was 591 days (10 days – 7 years). Complete healing was achieved after 29 ± 21 days (10–107 days). Recurrence of infection was observed in 9 wounds (35%) and non-fatal bleeding occurred in 1 patient (5%). No limb amputation was needed ≤ 30 days. No patient died. Success rate was 62%.

Conclusion: Treatment of infection of prosthetic vascular graft with negative pressure is feasible and relatively safe method in carefully selected group of patients.

ENDARTERECTOMY OF ILIAC ARTERY: OLD-FASHIONED OR RENEWED METHOD?

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Introduction: Atherosclerosis of iliac arteries is best treated with endovascular angioplasty/stenting or surgical bypass graft, depending on disease severity. Endarterectomy of iliac arteries was frequently used in the 1970s and 1980s. However, it can still be performed e.g. in cases of previous failure or contraindication of standard revascularization methods.

Aim: Retrospective evaluation of single-centre case series of iliac endarterectomy.

Methods: Four patients at mean age 62 ± 5 years (57–68 years) were treated by iliac endarterectomy between 2013–2016. Rutherford categories of leg ischemia were 2 (moderate claudication) 2×, 4 (rest pain) and 5 (toe gangrene). Mean Society for Vascular Surgery (SVS) comorbidity score (0–21 points) was 7 points. The reasons for endarterectomy approach were: (1–2) failure or complication of previous endovascular treatment of short iliac stenosis, (3) high infection risk of prosthesis use in long iliac occlusion and (4) late in-stent iliac occlusion in a comorbid oncology patient.

Results: Technical success rate was 100%. Prosthetic patch plasty was used once. There was no peri-operative (≤ 30 days) death or amputation. Mean hospital stay was 11 days (5–27 days). Mean follow up was 16 months (1 month – 3.1 years). One patient sustained worsening of pre-existing chronic renal dysfunction. One patient required additional tibial bypass 1 month after endarterectomy to heal the gangrene. One patient developed symptomatic re-stenosis which was treated with iliac stenting 8 months after procedure. All patients clinically improved and recovered from leg ischemia. Two patients died of tumor with preserved limb 1 month and 3.1 years after procedure, respectively. Two patients are asymptomatic with patent iliac arteries 6 months and 20 months after endarterectomy, respectively.

Conclusion: Endarterectomy of iliac arteries is vital alternative technique for revascularization in selected patients when other methods fail or are contraindicated.

EVALUATION OF DIALYSIS ACCESS ROUTES IN TRANSPLANTED PATIENTS AT THE UNIVERSITY HOSPITAL IN OLOMOUC

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Aim: To evaluate the tactic of ensuring effective dialysis access in patients before transplantation and the patency of arteriovenous fistulas following transplantation.

Patient set: Between January 2010 and December 2015, 141 kidney transplantations were performed. 131 of these patients had regular dialysis. 17 (12.9%) patients had peritoneal dialysis, 7 (5%) patients had a permanent dialysis catheter, and 112 patients had an arteriovenous fistula/graft.

Results: An AVF was introduced and used for dialysis in 106 patients, of these 49 (46.2%) patients had a radiocephalic AVF and 52 patients (49.1%) had a radio-median cubital AVF. In the early post-transplantation period (up to 30 days), 4 AVFs (3.7%) became occluded; in the subsequent monitoring period, 15 AVFs (14.1%) became occluded. Three AVFs (2.8%) had to be eliminated due to steal syndrome, 1 was removed upon patient request. During the monitoring period, 14 AVFs (13.2%) were adjusted due to steal syndrome or aneurysm. Primary AVF patency was 91.5% after 12 months, 75.5% after 24 months and 58.5% after 36 months. Cumulative AVG patency was 85.7% after 12 months and 28.5% after 24 months.

Conclusion: Excellent AVF patency and the low rate of complications of these AVFs after transplantation support the maintenance of autologous dialysis access.

ANGIOLOGY IN GERMANY AND IN THE CZECH REPUBLIC, A CRITICAL SURVEY FROM EACH OTHER'S PERSPECTIVE

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In this presentation the author compares angiology in both countries, evaluates the advantages and shortcomings of each system putting emphasis on different approaches to indications and treatment strategies in individual areas of vascular medicine.

Going beyond the scope of the assignment, he compares individual health care systems and the status of the medical personnel from a wider perspective.

The title and the communication also contain information that can be beneficial to potential candidates seeking employment in the neighbouring state.

ENDOVENOUS LASER ABLATION IN PATIENTS ON WARFARIN THERAPY

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Background: There is an increasing number of patients who are on anticoagulation therapy with warfarin and suffer from chronic venous insufficiency in western countries. The aim of this presentation is to show the possibilities and risk factors of endovenous thermal ablation in patients on anticoagulation therapy.

Methods: We provided retrospective study to assess ablation rates (1 year after procedure) and periprocedural bleeding complications. 25 patients on warfarin underwent endovenous laser ablation fa Biolitec, 1 470 nm wavelength at One Day Surgery Clinic Palas Athena, Prague from 2013 to 2016. Patients with concomitant phlebectomies were excluded from the study.

Results: No major bleeding occurred in our group of patients. We frequently noted minor bleeding about 50% of patients in the dermal and subdermal layer. There was no reason to use infusion therapy. The occlusion rate was 88% of patients after 1 year follow up.

Conclusions: In this small study, we found that endovenous laser ablation in warfarin patients is safe and efficacy method.

CHANGES IN ANATOMICAL VASCULAR NOMENCLATURE

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In September 2016, the Executive Board of the International Federation of Associations of Anatomists (IFAA) approved the proposal of changes of the morphological nomenclatures, prepared by the Federative International Programme on Anatomical Terminology (FIPAT, founded in 2009). The last revisions, the Terminologia Embryologica (TE), approved in 2009 (and published as a book in 2013) was revised as TE2 and a new nomenclature was created by separating the chapters Central nervous system, Peripheral nervous system and Senses from the Terminologia Anatomica (TA, approved in 1997 and published as a book in 1998) and from the Terminologia Histologica (approved in 2005 and published as a book in 2007),

and was named Terminologia Neuroanatomica (TNA). Both TE2 and TNA are accessible online free of charge but will not be published in a hardcopy. TNA also contains terms of arteries and veins of the brain and spinal cord. Changes of the vascular nomenclature comprise introduction of more segments to *arteria carotis interna* (C1–C7), *arteriae cerebri* (A1–A5, M1–M4, P1–P4) but not to *arteriae cerebelli*. For the spinal cord, *arteria radicularis magna* was added. As for the veins (as well as *arteriae cerebelli*), the position of concordant and nonconcordant adjectives was changed to previous forms – *vena cerebri magna*, *arteria cerebelli inferior anterior*. In general, TNA and TE2 contain 6 columns of terms: Latin, English UK spelling, English US spelling are official and mandatory with only one term in each column; and Latin synonyms, English synonyms and Related terms (including Eponyms) serving only for informative purposes. These new versions of neuroanatomical and embryological nomenclatures are valid worldwide since the beginning of 2017. A new version of TA is under process yet.

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VENA RENALIS SINISTRA CIRCUMAORTICA

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The retroperitoneal venous system develops in a successive formation and perishing of embryonal veins. It is a complex process and that is why the anatomy of the *vena cava inferior* and *venae renales* shows extensive variability. We present the circumaoctic course of the *vena renalis sinistra*, hence the variation can be termed as the *vena renalis sinistra circumaoctica*, often called in English literature as renal venous collar. The incidence of the *renalis sinistra circumaoctica* based on a detailed literature survey is 8.7% and it substantially differs from our data performed in 1 137 CTs and 31 specimens, showing the common incidence to be 1.49%. This venous variation can appear during an abnormal development of the *anastomosis supracardinalis-postcardinalis* and its surroundings during the embryonal period. Its clinical relevance consists in the potential danger of bleeding during the interventional and surgical procedures as well as in confusion during the radiodiagnostic evaluation. A posterior nutcracker phenomenon (and syndrome) may develop in case of this variation, too.

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TIAGRELOR VERSUS CLOPIDOGREL IN PERIPHERAL ARTERIAL DISEASE PATIENTS (EUCLID TRIAL RESULTS)

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The EUCLID trial included 13 885 patients in 28 countries and is the largest cardiovascular (CV) outcomes trial to date, conducted exclusively in symptomatic patients with peripheral arterial disease (PAD). In the Czech Republic, there were 802 patients included in 15 sites. In this double-blind trial the patients with symptomatic PAD (defined by ankle-brachial index of 0.8 or less at enrolment and lower extremity symptoms, or by prior lower extremity revascularization for ischemic symptoms) were randomly assigned to receive as antiplatelet therapy either monotherapy with ticagrelor (90 mg twice daily) or clopidogrel (75 mg daily). The primary efficacy end point was a composite of cardiovascular death, myocardial infarction or ischemic stroke. The median follow-up was 30 months. The median age of the patients was 66 years, 72% of them were men, 43% were included on the basis of the pathological ABI and 57% on the basis of previous revascularization. The primary efficacy end point occurred in 751 of 6 930 patients (10.8%) receiving ticagrelor and in 740 of 6 955 (10.6%) receiving clopidogrel – so in patients with symptomatic PAD ticagrelor was not superior to clopidogrel. Major bleeding occurred at similar low rates (1.6%) in the two trial groups.

INSUFFICIENCY OF ANTERIOR ACCESSORY GREAT SAPHENOUS VEIN – CAUSE OF RECURRENCE AFTER ENDOVENOUS ABLATION OF VARICOSE VEINS

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Introduction: Endovenous ablation of truncal varicose veins of lower extremities is nowadays considered a new gold standard of therapy of chronic venous disease with very good long-term results. However, even with this treatment modality, recurrence can be observed.

Materials and methods: The most frequent findings in our experience were new insufficiency of anterior accessory great saphenous vein which was not seen before primary operation. Other causes of recurrence (reflux in the small saphenous vein, recanalization of ablated venous segment or neovascularisation) were less frequent.

Conclusion: Recurrence after endovenous ablation of truncal varicose veins is frequently different from common recurrence after traditional open surgery. Apart from technical or tactical error, the most frequent cause seems newly formed reflux in other truncal veins whereas neovascularisation – common cause of recurrence after open surgery – is very rare.

TREATMENT OF CANCER ASSOCIATED THROMBOSIS

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Background: The treatment with low-molecular-weight heparin (LMWH) is recommended for patients with cancer-associated thrombosis (CAT) during the first 6 months; the initial dose 200 IU/kg daily can be reduced to 2/3–3/4 after one month. The therapy should be re-evaluated after 6 month and subsequent therapy using LMWH or warfarin is recommended indefinitely, unless the cancer is resolved or any major contraindications arise.

Aims: To analyse the usage of various treatment modalities in CAT patients during and after the initial 6-month-period according to the course of cancer.

Patients and methods: 87 patients with CAT were treated with LMWH during the initial period. The proportion of patients in whom LMWH was replaced by warfarin during the first 6 months and during the entire follow up, was analysed in relation to the course of the cancer. The chi square test and chi square test with Yates correction was used for statistical evaluation.

Results: The median follow-up period (since the time of thrombosis onset) was 445 days; mean (95% CI): 743 (578–908) days. 6 months after the diagnosis of thrombosis 9/29 (31%) patients with complete remission (CR) of the cancer were treated with warfarin, while only 3/12 (25%), 0/9 (0%), and 1/13 (7.7%) of the patients with partial remission (PR), stable disease (SD) and progression, respectively, were treated with warfarin. Patients with CR and PR were more frequently treated with warfarin than patients with SD or progression ($p=0.02$). The median time from thrombosis onset to the switch from LMWH to warfarin was 219 days in patients in complete remission after 6 months and was not reached in patients in PR, SD, and progression. 13 patients died during the first 6 months, and 8 patients were followed less than 6 months. During the entire follow up, 25/30 (83.3%) patients with CR switched to warfarin, while only 5/12 (41.7%), 1/9 (11.1%), and 1/13 (7.7%) patients with PR, SD, and progression, respectively, were treated with warfarin. The proportion of patients with CR which switched to warfarin was higher, than the proportion of patients with PR ($p=0.007$), with SD ($p=0.0003$), and with progression ($p<0.0001$).

Conclusions: The course of malignant disease is important for the choice of appropriate therapy of cancer-associated thrombosis after the initial period of LMWH therapy. The patients achieving complete remission are more prone to switch from LMWH to warfarin.

FINETUNING OF ENDOVENOUS LASER ABLATION IN THE TREATMENT OF VENOUS REFLUX – A COMPARISON STUDY BETWEEN CRYSTAL 1040 NM AND DIODE 1460 NM LASER GENERATOR

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Introduction: Endovenous laser ablation (EVLA) is widely used for minimally invasive treatment of venous insufficiency. There is an ongoing debate between the efficacies of different laser wavelengths.

Aim: The study sought to compare the more cost-efficacious 1 460 nm diode laser (DL) generator (Velas 2, China) to our gold standard crystal generator 1 060 nm neodymium-doped yttrium aluminium garnet (Nd-Yag) laser (Fotona; Slovenia).

Methods: This case-control observational study included a total of 308 patients that underwent EVLA between April 2016 and December 2016. The patients were randomized to either the Nd-Yag laser (159 patients), or to the DL generator (149 patients). The surgical procedure was identical in both study arms. Surgical ligation/crossectomy was performed in all veins with a diameter in excess of 15 mm and all patients on anticoagulant therapy.

Results: No statistically significant difference was noted between the early non-closure rates (99.4% for NdYAG vs. 100% for the DL; $p=ns$). There was a tendency towards better closure (disintegration of the vein) with the DL generator. The sole non-closure event noted in the NdYAG arm was successfully treated with re-EVLA. Both methods proved to be very safe and no difference was noted in the serious adverse events rate (one heat induced thrombus in both groups). The total number of minor adverse events (skin rubbing, pain, hematoma, oedema etc.) was not reliably reported in the study, but there seemed to be a clinical tendency towards better results with the DL generator.

Conclusion: The results of both methods were excellent and surpassed the results of our pilot study (Honěk et al.), presumably due to a more thorough surgical technique. There was no difference between the safety of both methods, although minor adverse events seemed to be more frequent in the NdYAG arm. Our study proved a slight, but not statistically significant superiority of the more cost-effective DL generator in terms of efficacy.

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VISCERAL ARTERY STENOSES

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Introduction: Stenosis of the visceral arteries is rarely diagnosed, but they are not uncommon. If only one of the three visceral arteries is affected, the patient is usually asymptomatic, because the huge collateral arterial network in the mesentery. Patients with two or three arteries stenosis often present with postprandial abdominal pain – called abdominal angina, weight loss, sitofobia. The most common cause is atherosclerosis, where the occlusive process in most cases involves the ostia and the proximal few centimetres of mesenteric vessels. FMD, arteriitis and other nonatherosclerotic lesions are rare.

Case reports: In our presentation, we assessed 3 symptomatic patients (aged 63–81) with unpaired visceral arteries stenosis, which we diagnosed during the time from June 2015 to September 2016.

Due to postprandial abdominal pain and weight loss, all of them were completely examined and the common gastrointestinal diagnosis was ruled out. However, they all had simultaneous atherosclerotic inflection of another vascular bed. Diagnosis of visceral artery disease was made using Colour Coded Duplex ultrasound scanning and CT angiography of abdominal vessels.

These polymorbid patients were subsequently treated using angioplasty with stenting of the involved arteries with prompt clinic improvement and relieving symptoms.

Conclusions: Visceral artery stenosis is rarely diagnosed. Because of aging population and the prevalence of atherosclerotic disease, today's physicians must keep this diagnosis in a mind, especially in patients with a long history of abdominal pain, weight loss and atherosclerosis in other vascular beds.

Symptomatic mesenteric ischemia is usually associated with severe and diffuse atherosclerosis not only in the visceral arteries. Surgical revascularisation has high morbidity and mortality due to the high surgical risk of these polymorbid patients. Percutaneous intervention with the stent implantation is an effective method, suitable for patients with several comorbidities.

SURGICAL TREATMENT OF INFERIOR VENA CAVA TRAUMATIC RUPTURE

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Inferior vena cava injury remains to be a formidable treatment challenge. The most imminent danger is life-threatening bleeding. In this report, we are presenting a case of a polytrauma

with a rupture of the juxtahepatic inferior vena cava, which was successfully treated using two-stage approach. The first part of the treatment consisted of damage control laparotomy at the level one trauma centre. The definitive treatment consisted of total hepatic vascular exclusion with subsequent treatment of the rupture of the inferior vena cava. The second procedure was performed at the Transplantation Surgery Department.

TOBA BTK 12-MONTH RESULTS: A NEW METHOD FOR TREATING CRITICAL LIMB ISCHEMIA WITH POST-PTA DISSECTIONS

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Background: In current practice, post percutaneous transluminal angioplasty (PTA) dissections are still significant problem which is in most cases managed with stent implantation. Stenting can result in sub-optimal outcomes including in-stent restenosis and stent fracture in arterial flexion areas. **Goals:** We evaluated a novel minimal metal Tack implant system for dissection repair in patients with critical limb ischemia (CLI). This study is focused on post-PTA dissections in below-the-knee area where the dissection repair is even more challenging.

Methods: Patients with CLI and angiographic evident dissection(s) following below-the-knee PTA were enrolled and treated with Tacks. Endpoints included: composite of major adverse limb events (major amputation or re-intervention in the target limb) and peri-procedural death, device success (successful delivery and deployment of Tacks), procedure success (site reported vessel patency), freedom from target lesion revascularization and changes in Rutherford category. Data through 12 months are presented.

Results: The study enrolled 35 patients, all Rutherford category 4 or 5 (12% and 88%, respectively). The mean lesion length was 51.7±27.7 mm. Post-PTA dissections were graded as A (21.2%), B (60.6%) and C (18.2%). Device success was achieved in 32 cases (91.4%). Procedure success was achieved in 31/32 cases (96.9%). At 12 months' post-procedure, amputation free survival was 84.5% and freedom from clinically driven TLR was 93.5%. There was significant ($p<0.0001$) improvement in Rutherford category with 75% of patients exhibiting a 4 or 5 step improvement.

Conclusions: Tack treatment of post-PTA dissection was safe and resulted in high 12-month patency and low rates of TLR.

Tack treatment represents a new, minimal metal paradigm for dissection repair that can safely improve the post-PTA clinical results even in below-the-knee area.

ANALYSIS OF THE USE OF DRUG-COATED STENTS AND BALLOONS IN OUR DEPARTMENT FOR 2015

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Aim: Analysis of the use of drug-coated balloon catheters (DEB) and drug-coated stents (DES) for percutaneous intervention in Vascular Centre Vítkovice Hospital for the year 2015 in terms of indications, frequency of use and the annual rate of restenosis.

Material and methods: Retrospectively analysed a total of 1,762 interventional procedures performed at our institution for the year 2015 in terms of the use of drug eluted technologies and their relation to plain balloon angioplasty and angioplasty with the introduction of a metallic stent. Subsequently they evaluated the indications for use of DEB and DES and evaluated the annual rate of restenosis.

Results: Indications for the placement of drug eluted stents were significant recoil or flow limiting dissection in the proximal part of the calf arteries, particularly in patients with critical limb ischemia. For drug eluted balloon catheters, it was mainly in-stent restenosis, restenosis after previous percutaneous transluminal angioplasty (PTA), anastomosis femoro-popliteal bypasses, anatomically problem areas for intervention as the common femoral or popliteal arteries and patients with acute and chronic limb ischemia with outflow into the one below the knee artery. Drug eluted balloon catheters were used in 256 cases in 186 patients corresponding to 14% of all our interventions and drug eluted stents were used in 23 cases in 23 patients representing 1% of all our interventions. If we evaluate the use of DEB in terms of lesion etiology then the drug coated balloon catheters were used at 61% for "de novo" lesions in 22% for restenosis after angioplasty and in 17% for in-stent restenosis. The DEB annual rate of restenosis was 8.6% (16/186) and in DES 4.3% (1/23), which corresponds to the published data worldwide.

Conclusion: We have demonstrated in the context of the published literature a low degree of restenosis in-use drug-coated balloon catheters and stents. The use of these new and promising but unfortunately also expensive technologies we consider to be adequate in our daily practise especially in view of the lack of scientific evidence of improving patient prognosis concerning reduction in overall mortality, mortality associated with PAD and increase the success of limb salvage.

SARCOIDOSIS IN ANGIOLOGY SURGERY

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Sarcoidosis is a multisystem granulomatous disease of unknown cause. It is most frequently encountered in young and middle-aged human, more common in women. Sarcoidosis most commonly affects the mediastinal lymph nodes and/or lungs as pulmonary infiltrates. From extrapulmonary disabilities, the most common are ocular and skin lesions. Liver, spleen, lymph nodes, salivary glands, heart, nervous system, muscles, bones, and other precious organs may also be affected.

In our paper, we present two case reports of patients who were suspected of sarcoidosis in Angiology surgery. The reason for angiologic examination was swollen ankles. The first case was a 28 years old young man, previously healthy, who came in because of ankle swelling accompanied with redness of joints lasting for about one week, later to be associated with fever to 39° C, sore wrists and both knees and some weight loss. The patient has no respiratory distress at rest nor during exercise, no chest pain. The second patient was a 43 years old woman, also previously healthy. For the last two months, she complained about swollen ankles with a gradual progression. In anamnesis, the presence of fever, retreatment for bronchitis, shortness of breath did not report. Both patients were examined within outpatient examination where ultrasound examinations of venous and arterial vasculature were conducted, which were without pathology. We have detected synovitis in ankle joints in both patients and in young man the additional synovitis in both knees. During hospitalization, we have carried out all the necessary tests within the complete differential diagnosis. Based on these tests, we confirmed sarcoidosis of the lungs in both patients, which was confirmed by HRCT, bronchoscopy and bronchoalveolar lavage.

As part of the differential diagnosis of sarcoidosis in Angiology surgery, it is more or less a rare disease. Anyway it should be noted, that angiologist should also think of this disease, even though it is the primary concern of pulmonologist.

LONG TERM, SINGLE CENTRE EXPERIENCE WITH SIMULTANEOUS AORTOILIAC ALLOGENIC RECONSTRUCTION AND KIDNEY TRANSPLANTATION

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Chronic renal failure is associated with accelerated atherosclerosis. Severe aortoiliac atherosclerosis is often considered

a relative contraindication for kidney transplantation. In management of those patients, possibility of simultaneous aortoiliac reconstruction and kidney transplantation should be discussed. We refer our 19-year experience with aortoiliac reconstruction using fresh arterial allograft and renal transplantation as one-stage procedure.

From 1997 until 2016 we collected data from 15 dialyzed patients treated with aortoiliac arterial reconstruction with simultaneous kidney transplantation. There were 11 men and 4 women with average age 53±8.6 years. Main reason of renal failure was chronic pyelonephritis (47%). We performed 9 aortofemoral and 6 iliac reconstructions with fresh arterial aortoiliac allograft as conduit for consecutive renal transplantation. Mean CIT was 11.8±4.6 hours. Allograft and kidney graft were obtained from the same brain dead donor. Average age of donors was 33.8±11 years. Follow up was 3 till 19 years.

Patency of aortoiliac allogenic reconstruction was 100%. 5-year patient survival was 87%. 1 and 5-year graft survival was 87% resp. 73%. Average serum creatinine in 1, 3, 6 months and one year after transplantation was 156, 115, 137 resp. 123 µmol/l. DGF was in 2 cases (13%). Lower limb amputation occurred in 2 cases (13%). There was no case of higher limb amputation.

Simultaneous aortoiliac reconstruction and kidney transplantation is safe and useful advance in specific group of dialyzed patients with severe aortoiliac atherosclerosis. Our experiences present successful surgical treatment of peripheral artery disease and renal failure in one-stage procedure as a chance for patients excluded from other transplant centres.

BRACHIO-FEMORAL PARADOX. SPIRAL FLOW AND ITS INFLUENCE ON ATHEROSCLEROTIC CHANGES IN HEALTHY ARTERIES AND IN GRAFTS

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Introduction: Spiral Laminar Flow (SLF) is one of the unique qualities of healthy arterial system in human population. "Blood leaves the left ventricle of the heart with a distinctive single spiral flow pattern and is propagated within the arterial system by the spiral configuration of the arterial luminal layers. SLF reduces static wall pressures at intimal layer and if SLF is lacking, arterial disease severity (tendency towards myointimal hyperplasia) is greater." (Stonebridge P.A. Lancet 338: 1360–1361, 1991).

We claim that brachial artery in human population doesn't suffer from atherosclerotic changes in comparison with femoral artery. Our effort and ambition is to explain the reasons and recommend using the term "Brachio-Femoral Paradox" in vascular terminology.

Material and methods: Retrospective multicentre structural study. During the period February 2010 – February 2013 we collected the data from 72 patients in stage Fontain 2b (severe claudication) and 3 (critical limb ischaemia, ulcer or rest pain). According the TASC's IIb morphological stratification and with the use of duplex ultrasound and CTag in all patients, we scored our patients as level C or D, suitable for surgical revascularization. **In all cases, the new concept of grafting was used respecting the SPIRAL FLOW FACT.** There were 61 males and 11 females. In this group, 75 bypasses were constructed. 68% (n=51) were F-P prosthetic bypasses with AK anastomosis, 32% (n=24) were F-P prosthetic bypasses with BK anastomosis. There were no suitable veins on ipsi or contra lateral leg in BK group. The risk factors we considered to be involved and scored were smoking, diabetes, hypertension and overweight. ATB prophylaxis was used in all cases; the patients were operated in general or epidural anaesthesia. Low molecular heparin was used in all cases postoperatively and next 12 weeks p.o. dual therapy continued.

Results: Technical success was achieved in 100%. 75 bypasses were constructed; median follow up was 11 months (2–36). In this group, there were 3 occlusions with 2 deaths both due to serious comorbidities in the group of patients with CLI. Risk factors for vascular disease and indications for surgery were similarly distributed in AK and BK bypasses. Primary patency rate was 85% (11 bypasses occluded), secondary patency 96% (8 bypasses from 11 occluded were successfully reopened with the use of thrombolysis, PTA or open surgical revision). The patient underwent duplex sonography within 3 months to verify spiral flow pattern of the flow below the distal anastomosis. There was no bleeding or infections.

Conclusions: The study with modified graft was not the aim and is not the point. Principal is the fact of spiral flow of blood in human kind. It is well known, that brachial artery in human population doesn't suffer from atherosclerotic changes in comparison with femoral artery. We claim – the unique characteristics of undestroyed spiral flow in brachial artery can explain this paradox, which has not been explained on any level of scientific evidence yet. Existence of spiral laminar flow in healthy arteries is well documented with the use of duplex sonography and there are no doubts that it exists. The crushing of spiral flow properties of blood stream can be seen in arterial tree, on sides of sharp or important branching – like in carotid bifurcation or Y common iliac branching in abdominal aorta etc. The more permanent smooth spiral flow exists, the better prevention for atherosclerotic disease can be expected.

We are asking the vascular specialist, who knows how to undoubtedly explain existing Brachio-Femoral paradox to join our group.



ANGIOLOGICAL ASPECTS OF VENOUS ANEURYSMS

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Venous aneurysms (VA) are very rare in contrast with arterial aneurysms. We speak of venous aneurysms if their diameter is 1.5 times larger than the normal lumen of a vessel in the given locality. Macroscopically, we distinguish between fusiform and saccular VA. Microscopically, histopathology examinations reveal the loss of elastic and muscle fibers in the vessel wall, causing its subsequent weakening.

As far as the locality is concerned, VA may occur in any part of the venous system. It may be located in the deep or in the superficial venous system on both the upper and the lower extremities. On the lower extremities VA are more often associated with varices; however, they may also appear without them. VA may appear in various sizes and may be symptomatic or asymptomatic.

Symptomatic VA may be associated with pain and pressure in various localities, intestinal bleeding or thromboembolic complications. Superficial VA on the neck, face, thorax, and the vessels on lower extremities are usually asymptomatic. They may also cause cosmetic problems especially on the neck, face and lower extremities. However, VA located in the deep venous system of the lower extremities are often associated with venous thrombosis and pulmonary embolism.

The aetiology of VA is usually unknown. Possible causes of VA include trauma, inflammatory processes, repeated punctures, degenerative weakening of vein wall, congenital venous angiodysplasias such as Klippel-Trénaunay syndrome and Weber syndrome.

The indications for surgical therapy of VA are cosmetic and medical. Cosmetic surgery is indicated in VA on the neck, face and upper extremities. These are usually asymptomatic and usually don't rupture.

Indications due to medical reasons are usually surgical. This concerns VA of the deep venous system of the lower extremities due to the high risk of thromboembolic complications that may occur despite anticoagulation therapy. What is recommended is tangential aneurysmectomy and lateral venorrhaphy, or aneurysmal resection with substitute autologous vein or vein prosthesis. The authors present their own experience with the surgical therapy of VA.

SURGICAL APPROACHES FOR TREATMENT OF THORACIC OUTLET SYNDROME

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Introduction: True incidence of thoracic outlet syndrome (TOS) is unknown because many people with upper extremity pain and paresthesia have TOS that had escaped diagnosis by health care providers who may have failed to recognize it. There are three types of TOS, depending on which structure is compressed: neurogenic (nTOS), venous (vTOS), and arterial (aTOS). The most common is nTOS, accounting for more than 95% of all TOS patients, vTOS occurs in 2% to 3%, whereas aTOS is the least common, being seen in less than 1% of patients. First successful surgical resection of a cervical rib for relief of thoracic outlet syndrome (TOS) was described in 1861 by R.H. Coote, resection of first rib in 1910 by T. Murphy.

The later part of the 20th century was significant for development in the surgical approach for thoracic outlet decompression. The supraclavicular exposure had been the primary approach up until this time. However, several surgeons began describing different approaches, including the posterior approach to the first rib by Clagett in 1962, the transaxillary approach by Roos in 1966, and the infraclavicular approach by Gol in 1968. Controversies regarding surgical technique concerning rib resection alone, scalenectomy alone, or rib resection in conjunction with scalenectomy continue to exist today.

Purpose: Aim of this work was to decide, which surgical approach is useful for a specific type of TOS.

Result: During 1.5 years we performed 8 operations. 4 were done for nTOS, 3 for vTOS, 1 for aTOS. We used 4 different approaches. We performed the transaxillary first rib resection in 2 patients with nTOS and 2 with vTOS, the supraclavicular approach was used in 2 cases of nTOS. We used the infraclavicular and the paraclavicular approach once. We caused the reversible injury of the intercostobrachial nerve once during the transaxillary access. Other serious complications have not been seen. All veins operated for vTOS are patent, 3 patients with nTOS are relieved of symptoms and one has improved (transaxillary approach).

Conclusion: **nTOS:** In the last decade, supraclavicular approach is preferred due to wider exposure of all the anatomic structures, primarily the posterior part of the brachial plexus. Reported disadvantages of the transaxillary approach include incomplete exposure of the structures composing the scalene triangle, difficulty achieving complete anterior and middle scalenectomy or brachial plexus neurolysis. In a comparison of patients with nTOS undergoing transaxillary first rib resection or supraclavicular first rib resection no difference was seen in the initial success rate among these procedures. Although the long-term success with supraclavicular scalenectomy and first rib resection appeared to be somewhat better at 10 to 15 years

(71%) than the results with either anterior scalenectomy (66%) or transaxillary first rib resection (64%), there was no statistically significant difference among these operations (Sanders analysis).

vTOS: In a literature, 3 approaches are described – paraclavicular, transaxillary, infraclavicular. There is no evidence, which of these types of procedures is better. The best exposure of the subclavian vein is performed by infraclavicular access and therefore it is recommended for vein reconstruction.

aTOS: The supraclavicular approach is the method of choice. In the inevitable cases, it is possible to combine this access with infraclavicular approach (i.e. paraclavicular). The transaxillary access is not recommended.

Finally, I should say that the most important in deciding of surgical approach is the experience of the surgeon.

OPEN SURGERY IS THE METHOD OF CHOICE FOR AAA PATIENTS WITH ACCEPTABLE OPERATIVE RISK

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After the diagnosis of asymptomatic abdominal aortic aneurysm (AAA) the choice between an observation and the operation is individual. It depends on the risk of rupture of AAA, operative risk, modality and the location of AAA, patient's life expectancy and personal preferences. When we decide to operate, we have to choose which procedure is the best for the patient, whether an open surgery or the endovascular one – endovascular aneurysm repair (EVAR).

Basic decision-making algorithm begins with risk of rupture of AAA. If there is a low risk, patient should be regularly followed-up. If there is a significant risk of rupture, we should consider life expectancy and think about the operation. At this point we have to decide which type of procedure is suitable for the patient. When the operative risk is high and open surgery is dangerous, we should think about EVAR. We have to keep in mind, that not everybody is suitable for EVAR. The most important is patient's anatomic suitability. Predominant factors include neck morphology. There are many studies, which compare open surgery and endovascular repair.

EVAR-1 – randomized prospective study with 1,082 patients showed, that 30-days mortality was reduced in EVAR from 4.7% in open surgery to 1.7%. Although the secondary interventions were more common in EVAR – 9.8% against 5.8% in open surgeries.

EVAR-2 trial compares whether EVAR is better than medical management in high-risk patients. 338 patients who were unfit for an open repair were randomized to either EVAR or medical management. EVAR-2 correctly underscores the fact that very high-risk patients do not benefit from AAA repair, because they die from other causes before a benefit can be realized.

Open surgical treatment has rich history and excellent outcomes, but is suitable only for "cardiovascular-healthy" patients. On the other side, anatomic predispositions are not so important. Perioperative mortality rate is between 1% and 7% (usually 3%) depending on the medical centre experience.

Between 2014 and 2016 we performed 83 elective infrarenal AAA repairs with 0% mortality. More detailed informations are in the presentation.

RISK FACTORS AND PREVALENCE OF DEEP VEIN THROMBOSIS IN PATIENTS WITH PRIMARY CHRONIC VENOUS DISEASE

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Aim: Venous thromboembolism (VTE) is a multifactorial disease. Reported risk factors for VTE vary widely, and the magnitude and independence of each are uncertain. Varicose veins are referred to as independent and important risk factors for VTE. We investigated the prevalence of VTE in patients suffering from CVD and we compared it with general population. The association between common intrinsic factors and risk of VTE in patients with chronic venous disease (CVD) has not been extensively examined in the Czech population to date.

Methods: A retrospective observational study on consecutive patients with primary CVD (C0 to C6). 641 outpatients were enrolled (152 men, 489 women). The prevalence of VTE was retrospectively evaluated according to sex, age and BMI.

Results: VTE episodes occurred in 32 patients with CVD (5%). The risk of VTE showed no gender predominance (OR 1.49, 95% CI = 0.90–2.45; $p=0.146$). There was no increased relative risk of VTE in the age group 46–69 years compared with patients aged ≤ 45 years ($p=0.35$). In the age group ≥ 70 years, the risk of VTE was 3.2 times higher than in patients aged 46–69 years and 4.78 times higher than in patients aged ≤ 45 years. The risk of VTE rose very significantly in obese compared with normostenic patients ($p=0.002$). A history of VTE episode was found in only 2.4% patients with a BMI ≤ 25 kg/m², for the BMI 26–29 kg/m² group in 4.3% patients but with a BMI ≥ 30 kg/m² it was 9.1% of patients.

Conclusions: The 5% prevalence of VTE episodes in our patients with primary CVD (C0 to C6) was comparable with the prevalence of VTE in the general European population. CVD did not increase the risk of VTE. No gender was associated with increased risk of VTE. Age ≥ 70 years and obesity were strongly associated with an occurrence of VTE. The risk of VTE rose very significantly (4.1 times) in obese compared with normostenic patients and in older ≥ 70 years (4.78 times) compared with younger (≤ 45 years) patients. Obese patients with CVD were at higher risk for VTE than obese people in the general population.

TREATMENT OF GREAT AND SMALL SAPHENA USING HISTOACRYL. PILOT STUDY WITH OWN TECHNIQUE

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Introduction: Treatment of insufficient Great and Small Saphena (GSV, SSV) is continuously simplifying. Latest techniques are painless and can be done without any tumescence.

Sapheon, Venaseal – commercial glue and device are available in Western Europe and surrounding countries for several years. It is practically impossible to get the licence in the Czech Republic. We developed our own technique and improve it progressively in last two years.

Methods: We treated 23 saphena trunks in 21 patients (21 GSV 2 SSV) using Histoacryl glue. Patients with significant reflux of GSV or SSV, documented by duplex sonography were indicated to the procedure. Patients with clinical classification C2–C5 were treated.

Endovascular catheter was inserted using Seldinger technique. The tip was positioned under sonography control and flushed with 5% glucose. The Histoacryl glue was applied consequently into the treated part of saphena under ultrasound probe compression. The whole procedure did not take longer than 15 minutes.

Results: Patients were observed in 1 week, 6 weeks, 6 months, and 1 year intervals. Immediate success was 100%. All patients were without reflux after 1 year. One patient had recanalization less than 10 cm without reflux after 1 year. Four patients had recanalization longer than 10 cm without significant reflux after 1 year.

Results were evaluated by VCSS (Venous Clinical Sever Score), Aberdeen questionnaire, SF 36 questionnaire (Common quality of life). Duplex sonography and photo documentation were used.

We registered one serious complication – pulmonary embolism. It was one of our first patients. Patient had to stay 14 days in hospital on low molecular heparin and on warfarin for 6 months. The patient is now without any difficulties or permanent disabilities.

Conclusion: Our technique of gluing GSV and SSV with Histoacryl is promising. It can be used for cosmetic indications but we found it very useful in patients with severe venous insufficiency, opened venous ulcer, elderly and patients with comorbidities for whom the classic operation would be an excessive risk.

CRYOSTIPPING IN THE TREATMENT OF VARICES AS A GOOD OPTION FOR THE PUBLIC HEALTH SYSTEM

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Aim: The presentation of cryostripping as an effective therapeutic method that we used in the cure of varicose veins.

Material and Method: This technique represents the modern alternative of saphenectomy through stripping procedure. It is done with the help of a special freezing probe introduced retrograde in the saphena magna or parva vein after performing the crosectomy. By freezing the vein with nitrogen up to -85° C, the vein adheres to the probe and therefore it can be extracted.

Results: We introduced the method in September 09, 2013 and performed over 300 operations with good results. This procedure presents the advantage that through the vein ablation the risk of repermeabilisation and recurrence disappears. There is minimum tisular trauma, therefore it can be used at the patients with phlebo- lymphedema of the lower limbs avoiding the postoperative cutaneous paresthesias through intercepting the saphenous nerve. From the economical point of view, this method is very affordable due to the fact that the freezing probes can be resterilized. The patient can undergo this procedure in the surgical ambulatory conditions having a faster reintegration.

Conclusion: We consider the cryostripping a very valuable procedure that perfectly respects all the principles of the venous surgery. Introducing this technique in our country is a step forward in the field of phlebology.

TREATMENT OF LOWER LIMB VENOUS ANEURYSMS – REVIEW OF LITERATURE AND 3 CASE REPORTS

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Introduction: Aneurysms of the deep venous system of the lower limb are not common, but the first symptoms may be already very dangerous, containing deep venous thrombosis, massive pulmonary embolism, rupture of the venous aneurysm and bleeding.

Method: We searched PubMed database for publications using key words – venous aneurysm, lower limb, deep venous system. Review of the published data was made; those were completed by our own experience with 3 cases of popliteal vein aneurysm (PVA).

Results: From almost 700 found publications, 172 were studied in detail. Others were excluded (full text not written in English or German or not available, description of other than lower limb deep venous true aneurysm, description of symptoms or diagnostic process alone without the treatment and results). Publications usually consisted of case reports (218 cases until December 2016). Big volume studies are missing. 9 cases received anticoagulation therapy alone, 1 case was treated using foam sclerotherapy and the others were treated surgically. Tangential aneurysmectomy with lateral venorrhaphy was used in almost 70% of cases with subsequent anticoagulation therapy for 2–6 months. Other surgical treatment option may be resection with direct reanastomosis or replacement (venous or PTFE graft) and rarely ligation only. Implantation of inferior vena cava filter preoperatively was documented in 8 cases only. Severe complications rate in surgically treated patients was low, comprising venous graft thrombosis in 0.6% and aneurysm recurrence in 1.9%. On the other side, almost 50% of the patients treated conservatively suffered from pulmonary embolism. During last 10 years, we treated 2 patients with symptomatic popliteal vein aneurysm. Both patients were treated surgically with tangential aneurysmectomy and lateral venorrhaphy. The follow up was uneventful without recurrence or further pulmonary embolism. Third patient refused surgical treatment and is kept on anticoagulation therapy 10 months without any complication.

Conclusion: Surgical treatment of venous aneurysms of the deep venous system is recommended even being asymptomatic. Primarily if it is bigger than 20 mm in diameter and/or if it contains a thrombus. Tangential aneurysmectomy with lateral venorrhaphy is a method of choice with good long-term results. Duration of anticoagulation therapy after surgical treatment should be at least 2–3 months. Inferior vena cava filter does not seem to be essential for avoiding peroperative pulmonary embolism and is not routinely used.

CATHETER RELATED VENOUS THROMBOSIS: DIAGNOSIS AND MANAGEMENT

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The most frequent sites of catheter thrombosis are certainly the upper limbs. This is because the catheters are more frequently placed in these locations. About 5% to 10% of VTE involve the upper extremities. We have two etiologic groups:

- primary: unprovoked with or without thrombophilia, effort-related and thoracic outlet syndrome,
- secondary: provoked by central venous catheters, pacemakers, or cancer.

Secondary Upper extremities Deep Vein Thrombosis (UEDVT) accounts for 75% of all cases.¹

If UEDVT is not related to CVC, it can be due to idiopathic, effort/outlet syndrome (Paget-Von-Schroetter), trauma, sport, neoplastic, compression/infiltration, lymphomas, lung cancer (Pancoast-Ciuffini Syndrome), breast cancer.

If UEDV is related to CVC, predisposing factors are cancer chemotherapy, Intensive Care Unit.

Other factors may be parenteral nutrition, extracorporeal dialysis, hemodynamic invasive monitoring, pacemaker.

The thrombus involves the subclavian, axillary, or brachial veins, and may include extension to the brachiocephalic vein, superior vena cava or the internal jugular vein.

Ultrasound (US) is the most commonly used initial test for suspected UEDVT or UESVT. It is widely available, non-invasive and does not result in exposure to radiation.

Only two studies (total of 65 patients) have evaluated the accuracy of a single CUS compared with venography. Although the pooled sensitivity and specificity were 97% (95% CI, 90–100%) and 94% (95% CI, 80–99%), respectively, the studies were of low quality and the CIs are wide.

The sensitivities and specificities of Doppler and color Doppler combined with CUS or color Doppler alone were similar to that for CUS.²

Acoustic shadowing from the clavicle, however, will limit visualization of a short segment of the subclavian vein and may result in a false negative study.³

In asymptomatic patients, sensitivity can be as low as 31%, with false negatives a consequence of either small non-occlusive thrombi or centrally located thrombi that are difficult to detect, due to inadequate imaging windows.⁴

In patients with suspected upper extremity DVT in whom initial US is negative for thrombosis despite a high clinical suspicion of DVT, the guidelines suggest further testing with a moderate or highly sensitive D-dimer, serial US, or venographic-based imaging (traditional, CT scan, or MRI).² Therefore, the degree of suspicion is important to rule out DVT; it is possible to use a clinical score to help in the diagnosis as well. A clinical score for predicting the presence of upper extremity deep vein thrombosis (DVT) was developed in a sub cohort of 140 patients, and confirmed in two separate validation cohorts with a total of 217 additional patients. All episodes were objectively confirmed by ultrasound examination. A risk score was generated from the following four parameters:

1. Presence of a catheter or access device in a subclavian or jugular vein or a pacemaker (plus 1 point)
2. Unilateral pitting edema (plus 1 point)
3. Presence of localized pain in that extremity (plus 1 point)
4. Another diagnosis at least as plausible (minus 1 point)

Total scores were then rated as low probability (zero points or less, prevalence of upper extremity DVT 9 to 13 percent), intermediate probability (one point, prevalence 20 to 38 per-

cent), or high probability (2 to 3 points, prevalence 64 to 70 percent).⁵

Prevention and treatment of venous thromboembolism of upper extremities were established in a 2013 International Consensus of International Angiology.⁶ For the treatment of symptomatic catheter related thrombosis (CRT), anticoagulant treatment (AC) is recommended for a minimum of 3 months; in this setting, LMWHs are suggested. VKAs can also be used, in the absence of direct comparisons of these two types of anticoagulants in this setting. In patients with cancer, the experts recommend that the use of LMWH alone, for a minimum of 3 months, should be considered for the treatment of CRT, depending on the clinical status of the patient.⁷

The CVC can be kept in place if it is functional, well-positioned and non infected and there is good resolution under close surveillance; whether the CVC is kept or removed, no standard approach in terms of duration of anticoagulation is established.

When venous thrombosis is suspected, the CVC should not be removed until tests confirm the size and location of the thrombosis. The CVC should be removed using safety measures to prevent complications such as air embolism, hemorrhage, catheter fracture or dislodgement of thrombosis.

There are no available data on the optimal timing between CVC withdrawals after initiation of anticoagulant therapy.

Ultrasound detection of UEDVT is reliable and it can be performed bed-side in acute care patient setting. The treatment AC is based for 3 months, further longer treatment should be taken into account in patients with additional risk factors, mostly cancer.

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MASSIVE PULMONARY EMBOLISM WITH AUTOIMMUNE HEMOLYTIC ANEMIA AS LIFE-THREATENING COMPLICATION IN PATIENT WITH ULCERATIVE COLITIS

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Acute pulmonary embolism (PE) is a form of venous thromboembolism (VTE) that is common and sometimes fatal. The evaluation of patients with suspected PE should be efficient so that patients can be diagnosed and therapy administered quickly to reduce the associated morbidity and mortality.

Autoimmune haemolytic anaemia (AIHA) is a collection of disorders characterized by the presence of autoantibodies that bind to the patient's own erythrocytes, leading to premature red cell destruction (i.e., haemolysis) and, when the rate of haemolysis exceeds the ability of the bone marrow to replace the destroyed red cells, to anaemia and its attendant signs and symptoms.

Inflammatory bowel disease (IBD) is comprised of two major disorders: ulcerative colitis (UC) and Crohn disease (CD). UC affects the colon, whereas CD can involve any component of the gastrointestinal tract from the oral cavity to the

anus. These disorders have distinct pathologic and clinical characteristics, but their pathogenesis remains poorly understood. VTE and AIHA as complications of IBD are not common but described.

We refer a case of 29 years old patient with UC on biological treatment with acute respiratory infection which was admitted to our department with high risk PE. Systemic thrombolysis was indicated as initial therapy because of hemodynamic instability, with excellent hemodynamic effect. In laboratory findings, there was also significant leucocytosis, macrocytalyt anaemia, reticulocytosis and haemolysis. Coombs test was positive for warm antibodies. The systemic corticoid treatment with ongoing anticoagulation (LMWH) was indicated with slow restitution of laboratory results.

In this case report, we would like to demonstrate the combination of two uncommon but potentially lethal complications of UC – and their successful treatment.



KAZUISTIKY V ANGIOLOGII

DIFFERENCES IN ASSOCIATION OF OLIVA-ROZTOČIL INDEX WITH VASCULAR DISEASE BETWEEN WOMEN WITH DIABETES MELLITUS TYPE 1 AND 2

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Background: In diabetes mellitus (DM), in addition to atherosclerotic changes, decrease of arterial compliance could have an important impact on development of vascular complications. Oliva-Roztočil Index (ORI), photoplethysmographic method based on computer based offline pulse wave analysis, could reflect more complex vascular damage, especially in diabetic patients. In addition, vascular damage could differ between patients with DM type 1 and 2. We compared correlation of ORI with parameters of micro- and macrovascular disease between women with DM type 1 and 2.

Methods: Data from 196 women with DM type 1 and from 113 women with DM type 2 were analysed. ORI was measured by Hadeo Smartdop 50. Differences between diabetic patients type 1 and 2 were analysed by the test of equality of correlation coefficients.

Results: We observed significant difference in nephropathy (all stages), which positively and significantly correlated with ORI in patients with DM type 2, but not type 1 ($r=0.283$ and $r=0.016$, respectively; between-group difference $p=0.011$). In other parameters under study (duration of diabetes, hypertension, dyslipidaemia, neuropathy, insulin resistance, glycated haemoglobin) no significant differences were detected.

Conclusion: Based on our data, ORI as a parameter of complex arterial damage was associated with diabetic nephropathy in women with DM type 2 but not type 1.

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FACTORS INFLUENCING RECANALIZATION OF DEEP AND SUPERFICIAL VEIN THROMBOSIS OF LOWER LIMBS

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Recanalization of thrombotic occlusion of superficial and deep veins is long-lasting process which depends on different factors and is of outmost importance for sequelae which includes

post-thrombotic syndrome and chronic venous insufficiency. Recanalization of occluded veins was followed by ultrasound investigation at deep and superficial veins up to 1 year.

In our study, we showed that recanalization rate depends on thrombus load and is faster in distal parts of thrombotic occlusions. Further, we showed that recanalization is faster and more frequent in females than in males. Recanalization of deep as well as superficial vein thrombosis is also influenced by endogenous fibrinolytic potential and by the level of systemic inflammatory markers. Multivariate analysis of recanalization rate in patients with DVT showed that it is significantly influenced by level of interleukin 6 (IL-6) ($p<0.001$) and P-selectin ($p=0.007$). Recanalization of SVT is also significantly related to levels of inflammatory markers: reactive protein (CRP) ($r=0.39$, $p<0.01$), IL-6 ($r=0.38$, $p<0.01$) and tumor necrosis factor α (TNF- α) ($r=0.26$, $p=0.04$).

In conclusion: after acute thrombotic occlusion of superficial or deep veins, recanalization starts. It depends on thrombus load, location of thrombosis and it is influenced by gender. Recanalization is also significantly influenced by systemic levels of inflammatory markers, particularly levels of interleukins, which promote thrombosis, inhibit thrombolysis and diminishes recanalization rate.

FIDE, SED QUI FIDAS, VIDE: CONTRIBUTION TO THE CASE STUDIES OBJECTIVISATION OF VACUUM-COMPRESSION THERAPY FOR THE AFFECTIONS OF PERIPHERAL BLOOD CIRCULATION FOR DIABETICS

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A common complication of diabetes are just peripheral circulatory disorders, which lead to the diabetic ulceration and risk of amputations of the limb. Vascular etiopatogenesis can be seen also in the case of diabetic polyneuropathy associated with microangiopathy vasa nervorum. It is generally accredited that certain forms of physical intervention given therapeutically and with appropriate manner can have a positive effect on peripheral blood circulation. Significant treatment effect is expected particularly in the application of alternating and hyperbaric environment acting on the treated leg hermetically sealed in a therapeutic applicator. This method of physical therapy is usually denoted as vacuum-compression therapy (VCT) and although as it is originally an angiology method it is still categorized among empirical methods of rehabilitation. Even in the world, professional literature have published only a few studies, however, always confirming the positive effect of

this form of instrument of physical therapy for peripheral perfusion. With respect to the excellent clinical effects VCT application in practice, we have attempted to objectify VCT effects on peripheral perfusion in the file of several case studies at least.

In the first part of the study we dealt with immediate effect, with an initial procedure of VCT on seven randomly selected patients – diabetics treated in Hamza's Specialized Hospital in Luže-Košumberk. In further research, we focused on three patients – diabetics in the state of critical ischemia limb – treated at the University Hospital Královské Vinohrady in Prague. These patients are objectified perfusion of treated limb same as during the first procedure, and during the last 20th medical procedures of treatment series. For objectification of VCT effect, we especially used laser Doppler velocimetry.

Practically in all cases, we observed an improvement of peripheral circulation, after a single administration of the procedure as well as after the administration of a series of procedures, where the cumulative effect of repeated procedures is reflected. These results support the recognized mechanism of action VCT, where normalization and increasing of the gradient filtration and absorptive pressures in the capillary area is expected. However, at the same time the results suggest, that VCT cyclic pressure reducing intravasal could also contribute to the development of pre-existing arterial collateral. It also

shows, that the effect of VCT is related to the properly selected biotropic parameters of physical therapy. Performed case studies reinforce the potential for effective and efficient use of VCT in the treatment of peripheral circulatory disorders in diabetic patients.

SIGNIFICANT FEATURES CHARACTERIZING THE NATURE OF VARICOSE VEIN DISEASE

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Varicose vein disease is characterized by inherent vein wall deficiency, venous reflux, and tendency to recurrence. Vein wall deficiency is largely caused by lack of collagen III and elastin, which entails increased distensibility, impaired contractility, permanent dilatation, and results in incompetence of varicose veins. Venous reflux in incompetent veins is set off by ambulatory pressure gradient occurring during calf pump activity with higher pressure in the iliac/femoral/popliteal vein and lower pressure in deep lower leg veins. Saphenous reflux induces ambulatory venous hypertension, the severity of which depends on the intensity of the centrifugal streaming. The ten-

dency to recurrence is caused by a phenomenon called hemodynamic paradox. Abolition of saphenous reflux removes the hemodynamic disturbance of any degree of severity but at the same time it triggers unfavourable run if events result in recurrent reflux. After abolition of saphenous reflux, calf pump activity induces drainage of venous blood from the thigh saphenous system into deep lower leg veins. As a consequence, the dividing line of the ambulatory pressure gradient, which is situated in healthy people just below the knee, is displaced into the thigh between the femoral vein and the incompetent superficial saphenous system. The pressure gradient, once dislocated into the thigh, sets off physical and biochemical chain of events provoking the development of recurrent reflux.

A concept of the therapeutic procedure called Hemodynamic Based Treatment of Varices counteracting the tendency to recurrence is presented. It embodies abolition of reflux at its source (mostly at the sapheno-femoral junction) as well as hindrance of drainage of venous blood from the thigh saphenous system into deep lower leg veins in the isthmus, i.e. at the knee level. In this way, the tendency of recurrence would be kept at bay; in addition, it would inhibit the development of ambulatory venous hypertension in the veins below the knee and might preserve long segments of the great saphenous vein for potential use as bypass graft.

ENDOVASCULAR TREATMENT OF CHRONIC ILIOFEMORAL OCCLUDED LESIONS

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Background: To report the treatment of stenting for chronic iliofemoral occluded lesions.

Material and methods: From November 2009 to November 2016, 31 patients (25 women; 34 median age years) were admitted for endovascular treatment of chronic venous occlusions after deep venous thrombosis. The major symptoms were venous claudication, oedema and pain. Lesions were unilateral, 26 on the left side. Most commonly, our patients were treated by self-expanding Wallstents. Twenty-two procedures required stenting across the inguinal ligament. Primary stenting should always be performed under general anaesthesia.

Results: No perioperative death or pulmonary embolism occurred. Primary recanalization was accomplished in 31/31 (100%). The follow-up was with clinical examination, Colour duplex ultrasound and CT venography. Venous claudication, oedema and pain resolved in those successfully recanalised.

Conclusion: Endovascular stenting is a safe, effective and minimally invasive technique for the treatment of iliofemoral occluded lesions. Endovascular stenting is the current method of choice in this therapy.

ASVAL (AMBULATORY SELECTIVE VARICOSE VEIN ABLATION UNDER LOCAL ANAESTHESIA)

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Ambulatory selective varicose vein ablation under local anaesthesia is a method based on the ascending theory – antegrade haemodynamic evolution of varicose veins of lower limbs. Authors explain the need for individual approach to the treatment of lower limb varicosities. Minireview summarizes basic principles. Case report documents diagnostic and treatment protocol.

PHARMACY THAT HELPS TO QUIT SMOKING

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Aim: To train hospital pharmacists and pharmaceutical assistants in smoking cessation in the network of Czech hospital pharmacies and to increase the number of smokers trying to quit, with the special focus on patients before elective surgery.

Method: The training course was prepared for hospital pharmacists and pharmaceutical assistants with the use of scenarios for the actors of the simulation centre, including also the e-learning program. Seminars occurred from October 2016 until December 2016 in Prague, Hradec Králové and in Brno.

Results: 41 hospital pharmacists and 39 pharmaceutical assistants were trained. From the beginning of the project, the newly trained health professionals provided 300 brief interventions and 38 consultations in their pharmacies.

Conclusion: The education of hospital pharmacists and pharmaceutical assistants is some of potential ways how to effectively address the smokers in the pharmacies, without the need of referring them to the doctors. It allows also improve the quality of care of patients before the elective surgery, especially in the places with limited access to Nicotine Dependency Centres.

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FIRST EXPERIENCE WITH NEW NORMAL VALUES FOR INTIMA-MEDIA THICKNESS OF THE COMMON CAROTID ARTERY

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Measurement of ACC IMT is important to refine the risk of death from cardiovascular disease. German authors suggested new standards in 2015 and we compared them with the present evaluation.

We examined 100 individuals without clinical cardiovascular disease; the average age was 55.6 years. We determined the risk of death according to SCORE tables. We performed ultrasound examinations of the carotid arteries and pulse wave velocity expressed as CAVI and measured ankle pressure expressed as ABI.

Pathologic findings of the carotid artery for people at high risk of death was 55%, in persons at risk to below 25%. When using the new standards, it was 74% and 67%. Correlation with other parameters were much better in the evaluation of the carotid arteries in the old way.

Conclusion: The new evaluation standards for IMT ACC do not seem to be beneficial.

OUR EXPERIENCE WITH HYBRID PROCEDURES IN PERIPHERAL ARTERIES

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Hybrid procedures in peripheral arteries may be defined as a combination of an open surgical and endovascular approach accomplished in one session in a single operating room.

The common types of hybrid procedures are as follows:

- 1) Surgical reconstruction (endarterectomy or thromboembolectomy) of arteries in the groin – common, deep or superficial femoral arteries or proximal anastomosis of femoropopliteal bypasses or distal anastomosis of aortofemoral bypasses are usually affected. This reconstruction is combined with PTA or stenting of iliac, femoropopliteal or crural arteries.
- 2) Completion of Fogarty thromboembolectomy – e.g. stent deployment in the proximal anastomosis of aortofemoral bypasses, percutaneous aspiration thromboembolectomy or mechanical thromboembolectomy in infrainguinal occlusions etc.

In our department, a register of hybrid procedures in the treatment of peripheral artery disease has existed since the year 2004. Totally 96 procedures have been performed until now.

A growing number of hybrid procedures can be seen over the past years. Some interesting hybrid interventions are demonstrated in this paper.

Main advantages of hybrid procedures involve: 1) Lesser burden for a patient because of shorter anaesthesia than in a traditional operation. It may be useful in older and high-risk patients. 2) The management of lower limb ischemia is faster – it may be important especially in acute or critical limb ischemia. 3) Minimal extent of the vascular reconstruction – e.g. instead of femoropopliteal bypass an endarterectomy proximally and PTA distally can be performed, a natural arterial bed is preserved. 4) Lower cost owing to shorter hospital stay.

In addition, data from the literature are mentioned: Some trials comparing open surgery (femoropopliteal bypass) with hybrid intervention (endarterectomy of femoral arteries and PTA or stenting distally) revealed a comparable immediate and long-term patency of both methods. Thus, hybrid interventions represent an effective and minimally invasive approach in the treatment of patients with multifocal peripheral artery disease.

ENDOVASCULAR REPAIR FOR TYPE B AORTIC DISSECTION – NEW PERSPECTIVES AND OUR RESULTS

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Introduction: The incidence of acute type B dissection (TBD) is 5/100 000 per year. In the past years, conservative strategy consisting of high blood pressure control and pain therapy was recommended. INSTEAD study in 2006 compared conservative and endovascular (EV) treatment during two-year follow-up. It found no difference between these groups. However, conservative group mortality of 25–35% was documented in other studies. The results of prolonged INSTEAD-XL study covering the five-year follow-up were published in 2013. In the EV group, there was no mortality and aortic diameter expanded in 4% of patients, while in the conservative group, mortality was 17% and diameter increase in 28% of patients.

Methods: From May 2010 to May 2016, we implanted tubular thoracic stent graft (SG) for acute, subacute or chronic TBD to a cohort of 26 patients (14 men, 12 women), aged from 30 to 83 years (median 60 years). The dissection was acute or subacute lasting from 1 to 21 days from the onset to the implantation (median 5 days) in 18 patients. The indication for procedure in this group was haemorrhage in 7, pain or uncontrollable hypertension in 6, rapid expansion of the false lumen or new blood leak into the already thrombosed false lumen in 3, paraparesis in one and visceral malperfusion in one patient. During the period from the second to the ninth month after

the dissection onset, we implanted thoracic SG due to chronic TBD in 8 patients. The indication for procedure was late progression of the false lumen diameter in 5, recurrent pain in one, acute occlusion of the common iliac artery in one and new blood leak into already thrombosed false lumen in one patient. Left subclavian artery was deliberately covered by SG in 16 (62%) procedures, left common carotid simultaneously with left subclavian in 2 (7.7%) interventions. During the same procedure, we performed carotid-subclavian bypass in 2, carotid-carotid cross-over bypass in 2 and femoral-femoral cross-over bypass in one patient. Thoracotomy and blood clot removal was needed in two persons.

Results: The procedure was successful in 23 cases. In one patient, proximal extension was needed due to SG distal displacement. One patient died during 30 days (mortality 1/26; 3.8%). There was one acute retrograde type A dissection necessitating cardiac surgery. One patient was affected by paraparesis which subsided after spinal fluid drainage. Temporary dialysis was needed in two persons with partial renal failure (serious morbidity 4/26; 15%). During longer follow-up we documented late retrograde type A dissection after 2 and 3 months after the implantation (2/26; 7.7%).

Conclusion: New data from the international studies and our own cohort show better results with early endovascular treatment of type B dissection by stent graft implantation than conservative strategy in selected patients.

WAS THERE ANY OTHER WAY? FIRST EXPERIENCES WITH IDARUCIZUMAB IN PILSEN CASE REPORTS

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Recently the "new oral anticoagulants" (NOAC) started to be more frequently applied in the treatment of thromboembolic disease. There are three drugs available for this indication in the Czech Republic – direct thrombin inhibitor dabigatran (Pradaxa) and two inhibitors of FXa – rivaroxaban (Xarelto) and apixaban (Eliquis). So far, there has been only dabigatran as the only available antidote for serious bleeding or the need for rapid treatment of coagulation. This is idarucizumab, brand name Praxbind. The authors noted and analysed the data from six patients receiving dabigatran, whose state of health required the administration of the antidote. They focused on medical history, especially the indication for anticoagulation therapy, the dosage, the presence of any bleeding risk factors, renal function, etc. The available data show that all of these patients had significant impairment of renal function before the start of therapy with dabigatran. Therefore, they had an increased risk of overdose and subsequent bleeding. It means that in these patients, the choice of dabigatran

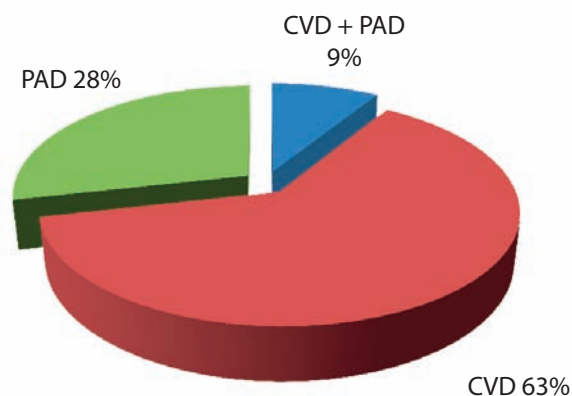
for anticoagulant therapy was incorrect or the dosage wasn't adequately reduced. So the bleeding complications could have been prevented, or their severity mitigated. Although, according to available data and the resulting recommendations NOAC treatment is safe, however it is necessary to observe the contraindications and the recommended dosage in specific situations/cases.

VASCULAR DISEASES OF THE LOWER EXTREMITIES IN SLOVAK POPULATION

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Diseases of the arterial, venous and lymphatic system of lower extremities are very common in the population of the Slovak Republic. However, we still do not know the precise incidence, prevalence and risk factors which contribute to the development of peripheral arterial disease of lower limbs, chronic venous disease and lymphatic oedema. The aim of our pilot study was to obtain knowledge on the basic risk factors, diagnostic and therapeutic procedures used in the outpatient angiologic departments in Slovak Republic. Altogether 10 659 patients (57% women, 43% men) were investigated by 96 angiologists and vascular surgeons. From the investigated patients 63% of them suffered from chronic venous disease (CVD), 29% had peripheral arterial disease of lower limbs (PAD) and 9% of investigated had both CVD and PAD (figure). 470 patients had lymphatic oedema. All patients were investigated clinically, BMI was calculated, ABI was measured, basic laboratory screening was done. The majority of patients with CVD were in the clinical class C2 (29%), C3 (37%) and C4 (15%). PAD patients were most often in the clinical class IIa (33%), IIb (26%) and IIc (12%) according to the Fontaine classification.



STENTING OF NON-THROMBOTIC ILIAC VEIN LESIONS IS SAFE AND IMPROVES LEG ULCER HEALING

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The **aim** of this study was to analyse how safe and reliable is iliac vein stenting in patients with non-thrombotic iliac/femoral vein lesions. Prospectively maintained database of 50 consecutive patients was analysed. Total 53 iliac veins were stented for non-thrombotic lesions (compression of iliac vein) between 2011–2016. Patients suffered from variety of symptoms including intractable swelling (C3), lipodermatosclerosis, healed ulcer (C4, C5), active venous ulcer (C6), venous claudication's or a combination of symptoms. Patients' median age was 72 years (range 22–90), male to female ration 21:29, median follow up was 8.2 months (range 1 to 36 months).

Perioperative mortality was 0%, surgical complication rate in 30 days was 2% (1 stent thrombosed; primary stent patency rate was 96%), 2 patients developed a non-surgical complication during first 30 days.

Sixty-eight percent of patients with active leg venous ulcer (C6) healed within 12 weeks post intervention.

Conclusion: Non-thrombotic iliac vein lesion stenting is safe and reliable and it might be suitable for selected group of patients with advanced skin changes due to venous hypertension.

OUR EXPERIENCE WITH ASVAL METHOD – FIRST 35 PATIENTS WITH GREAT SAPHENOUS VEIN REFLUX TREATED WITH ISOLATED PHLEBECTOMY

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Aim: Beside traditional descendent theory of primary varicose veins formation, new – ascendent theory – exists. Instead of junctions, in this theory the place of reflux creation are side branches of the main vein trunk. Side branches exstirpation leads to reflux disappearance, and the principle of isolated phlebectomy is called ASVAL method. We present our initial experience with the ASVAL method on first 35 patients.

Methods: We enrolled 35 patients into our study (the same number of limbs), 27 women and 8 men with average age of 49 years (from 23 to 69 years). All patients had truncal insufficiency of great saphenous vein (GSV) with distal insufficiency point (DIP) in maximal distance 10 cm bellow the knee and insufficient side branches. 23 patients were in C2 stage, 9 patients in C3 stage and 3 patients were in C4 stage of chronic venous disease (CVD) according to CEAP classifica-

tion. GSV diameter at junction level was from 0.4 to 1.3 cm (average diameter 0.92 cm), at mid thigh from 0.4 to 1.0 cm (average diameter 0.69 cm). Isolated phlebectomy without stripping was performed, and patients were followed-up after 7 days, and 1, 3 and 12 months after procedure.

Results: After 12 months, GSV diameters were at junction level from 0.3 to 1.1 cm (average diameter 0.73 cm), and at mid thigh from 0.3 to 0.9 cm (average diameter 0.42 cm) ($p=0.003$). After 12 months, 66 % GSV trunks (23 limbs) were sufficient. We counted GSV thrombosis in 2 patients, no other major complications were present.

Conclusion: We achieved very good results using ASVAL technique in most of patients, and we confirmed significant haemodynamics effect on GSV – in term of reflux disappearance, and in vein diameter as well. ASVAL method is still waiting for scientific and solid assessment, but it has its own place in new phlebological miniinvasive treatment modalities.

TRENDS IN COMPLEX DECONGESTIVE THERAPY

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Complex decongestive therapy (KDT) has become a commonly used term in lymphology for legally compliant treatment of hyperosmolar swelling.

This can be defined as a set of therapeutic measures designed to reduce swelling and subsequent maintenance of a reduced volume of limbs or other body parts affected by the swelling.

It is a treatment method with a broad perspective of multidisciplinary medical use, which brings back comprehensive view of care for a chronically ill person in today's atomized medicine. Therapeutic interventions typically take place in the entire bio-psycho-social complex, with maximum possible effort to ensure quality of life and/or functional health. Lymphology is a young but rapidly developing field that in 25 years of its existence has put into practice a range of therapeutic and diagnostic innovations in care for patients with chronic swelling.

Our short article discusses these innovations and other trends.



KAZUISTIKY V ANGIOLOGII

MICROCIRCULATION DEVELOPMENT AFTER IMPLANTATION OF NON-PULSATILE MECHANICAL CARDIAC LONG-TERM VENTRICULAR ASSIST DEVICE (VAD)

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Although till now there is no mass data available, we would like to present some interesting preliminary results on response of microcirculation to long term use of VAD.

Since peripheral blood flow beds (nutritional and thermoregulatory) do not respond identically on different stimuli (such as heat, cold, position, pulse or continuous blood flow), for examining of the nutritional blood flow, we chose direct observation by Intravital Capillaroscopy and for thermoregulatory one then Laser Doppler Flowmetry.

We have consecutive intravital capillaroscopy data of density, recruitment, permeability of capillaries and Laser Doppler Flowmetry measurements of perfusion and response on various tests like hyperaemic and veno-arteriolar reflex etc. The data set was collected on six patients after implantation of VAD (HeartMate2¹) in IKEM² where we examined both nutritional capillary and thermoregulatory blood flow bed.

According to our preliminary analysis, number and recruitment of capillaries slightly decreases with length of VAD application. There are indirect signs that permeability of capillaries increases with time. Generally, the flow velocities are slower but more constant compared to healthy control cases. Next steps should focus on changes in vasomotion of peripheral bed and a task of residual heart action in the process.

¹HeartMate2 (<http://heartmateii.com>)

²IKEM (<https://www.ikem.cz/en>)

IS EVERY REFLUX TO THE GREAT SAPHENOUS VEIN INDICATED FOR RADICAL SURGERY?

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Specialized centers are often asked for second opinion, before patient is accepting recommendation for surgery. Sometimes the reflux is just transient. Sometimes there are justifiable doubts about hemodynamic impact of reflux in the thin saphenous vein. Better understanding of different types of valvular damage, describing commissural refluxes from intervalvular refluxes is crucial for the treatment strategy. This improve our ability to make the right decision which patient will profit from ASVAL and for which is EVLA or RFA exigency. We try to explain, this small but important details. Last but not least there is a subgroup of patients with transient reflux for which medical treatment can be satisfying.

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