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## Book of Abstracts





Abstracts are listed in Czech alphabetical order by the first author's surname.

Index of authors and co-authors is available at the end of the book.

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

## NEW ANTICOAGULANTS AND DVT: CLINICAL OBSERVATIONS

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**Aim** of this clinical, instrumental, observational research is to observe the anticoagulant effect of rivaroxaban in patients with recent and previous DVT. We examined with clinical approach and echoduplex six patients affected by DVT. Four patients with previous popliteo-femoral DVT and VTE, mean age 50–70, males with femoral total recanalization and 30% of popliteal recanalization. These patients were in therapy with inhibitors K vitamin since four years but they had no compliance with this therapy for kind of life (frequent long distance travel and diet observance). For this reason we passed to new anticoagulant therapy, (rivaroxaban). Two patients, one male, one female, mean age 70–85 years, with recent femoral DVT and previous (about three years ago) popliteal-femoral DVT with femoral vein recanalization. These two patients were intolerant to Heparins and for that and to avoid the blood controls, preferred the new anticoagulants therapy.

**Results:** The first 4 patients after 30 days with Rivaroxaban therapy examined with echoduplex, showed a complete recanalization of popliteal vein. The second group of the patients showed after 14 days of rivaroxaban therapy a complete recanalization of femoral vein, recent occlusion, and after 30 days complete recanalization of popliteal vein.

**Conclusions and Comments:** Apart from the rapidity of the recanalization of the recent vein thrombosis (valves save and postphlebitic syndrome avoiding?), the most important phenomenon is the recanalization of the old distal vein thrombosis. The number of the patients is small but this clinical-instrumental observation puts us to consider a fibrinolytic action of this drug. No adverse events.

## THE FOAM-SCLEROTHERAPY IN THE TREATMENT OF SEVERE CHRONIC VENOUS DISEASE IN ELDERLY PATIENTS

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**Introduction:** The increase in the average age of the general population has caused a continuous increase in the occurrence of severe CVI among the elderly with serious effects on the quality of life of these patients, who are frequently unwilling and/or have contraindications to surgery (stripping, Linton procedure, SEPS). Ultrasound guided foam sclerotherapy appears to be the most promising alternative to surgery as it is minimally invasive and because of its reduced cost and favorable safety profile. Our study aims to assess whether foam sclerotherapy is able to improve the clinical conditions and quality of life of these patients.

**Material and Methods:** Between December 2005 and December 2014 we performed ultra-sound guided foam sclerotherapy in 94 patients with C4–C6 (CEAP classification) CVD, with a mean age of 73.8 years (range 68–85). All patients were evaluated before and after treatment and evaluated every year for 8 years through the Venous Severity Score System (VSSS) and quality of life questionnaire (SF12). 34 had been suffering from one or more leg ulcers (C6 – CEAP) for an average period of 3.2 years; they suffered from physical disability and a poor quality of life. 39 patients underwent internal or external saphenous trunk treatment; as to the remaining 55 patients, incompetent perforating veins and relapsing collateral varices accounting for ulcers and venous hypertension were treated. At the end of treatment, all patients were followed up with objective clinical exams, CDU, VCSS, VDS and SF12 questionnaire at 6–12 months each year thereafter.

**Results:** During the 6–84 month follow-up period (mean/average, 31.9 months) symptoms improved or disappeared in all patients. Ulcer healing was observed in 28 out of 34 patients (82.3%) with an average treatment time of 3.7 months. On average, VCSS improved from a baseline value of 13.6 to an after-treatment value of 4.1,  $p < 0.001$ ; VDS score improved from 1.9 to 0.8,  $p < 0.001$ . We obtained a complete



success in 86 patients (91.4%), a partial success in 5 patients (6.8%) and 3 failure (4.1%). No major or minor systemic side effects have been observed. The statistical evaluation of the SF12 questionnaire (test Wilcoxon) 0–72 month period (mean/average 31.9 months) has showed the improvement of the quality of life for both the physical and mental component. PCS-12,  $p < 0.001$  (MCS-12,  $p < 0.018$ ).

**Conclusions:** All patients expressed their gratitude and a high level of satisfaction for the functional, clinical improvement achieved after the treatment; especially patients with a more severe CVD (C4–C6) could achieve a significant improvement in their quality of life (SF12). In elderly patients, usually reluctant to undergo surgery, foam sclerotherapy is in our opinion a treatment of first choice; it allows this group of patients to hope for a cure and gain back, at least to a partial extent, their autonomy with significant positive repercussions on a psychological and social level.

### CHEST PAIN, ELECTROCARDIOGRAM AND CARDIOVASCULAR DISEASES IN YOUNG PATIENTS

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Chest pain and electrocardiogram in young patients may lead to difficulties in interpretation and differential diagnosis between normal variants and pathological aspects.

**Aim:** Our aim was to research these particularities in young patients presented to the emergency room for chest pain atypical for coronary heart disease, but with electrocardiographic abnormalities.

**Method:** We selected a number of 90 patients (p) aged under 50 years, 50 men and 40 women, from the 2,014 hospitalized cases. After a careful personal history, ECG, chest radiography, echocardiography, stress test, coronary angio-CT or pulmonary angio-CT were performed.

**Results:** Males were most commonly diagnosed with: coronary heart disease – 28 p (56%), 5 p with acute miopericarditis, 6 with pulmonary thromboembolism, 3 with early repolarization, 3 p with drug usage and 5 p were without cardiac disease. 11 (28%) women were diagnosed with coronary artery disease, 6 with pulmonary thromboembolism, 6 had miopericarditis, 3 Tako-tsubo cardiomyopathy, 1 aortic dissection and 1 was diagnosed with abnormal origin of the coronary arteries.

**Conclusions:** Women are more likely than men to have a non-cardiac cause or non-atherosclerotic cause of ECG abnormalities and atypical chest pain. The stress testing has a higher negative predictive value in women. Atypical chest pain with non-specific ECG abnormalities, even subtle ones can be a marker of coronary or other type of structural heart disease, with increase cardiovascular mortality in young patients.

### EPIDEMIOLOGY OF LYMPHEDEMA: WHAT DO WE ACTUALLY KNOW?

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The incidence of lymphedema (LE) is the decisive factor for planning of current treatment needs and preventive programs. Nevertheless, because of lacking of relevant obligatory registration (national and WHO registers) real incidence of LE is difficult to be judged.

The author used epidemiologic data of LE incidence from his own previous studies, searching in MEDLINE for present literature (recent 7 years period) and WHO register, but has not obtained sufficient concrete relevant data. The author presents investigated figures of LE incidence secondary to malignancies treatment. Published incidence rates vary substantially because of different locoregional treatment in workplaces and institutions (surgical technique and radiation therapy).

Because of lacking evidence of LE incidence in particular countries approximation of relevant data from comparable countries is necessary for rough orientation. In Middle European countries updated data from Germany are evaluable. The incidence in this country reaches 1.7 pts./per 1,000 of inhabitants (women 2%, men 1.7%), in Italy 0.9 pts., in Austria 0.6 pts./per 1,000 of inhabitants. In the Czech Republic is approximated 0.6 pts./per 1,000 of inhabitants (sc. approximately 8,500 pts. requiring systematic care). The incidence of LE in tropical countries and China (caused by filariasis) reaches about 200 million of inhabitants (infected are more than 900 million.).

For discussion the author submits urgent problems: (1) Diagnosis of LE is problematic, the criteria are not standardized, (2) The ratio of primary (due to patho-lymphangiogenesis) to secondary LE incidence varies in large scale from 31% to 73% of patients according to different specialization of working places and registration, (3) Might be degenerative changes in lymphatic system the cause of lymphatic drainage insufficiency by the seniors (according to Foeldi, 4,5 million Germans suffer for LE).

In conclusion: the real actual epidemiology, resp. incidence of LE remains in general still unknown.

### DEPRESSION – NEGATIVE FACTOR IN LYMPHEDEMA MANAGEMENT

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Nowadays, complex decongestive therapy (CDT) of lymphedema (LE) is based on psychosomatic conception of the

disease. It is generally accepted, lymphedema (LE) affects the patients physically as well as psychologically. The lymphedema patients are influenced by a plenty of psychosocial factors. Depression (very often associated with anxiety) represents one of the most important problems.

Since 10/2005 till 12/2014 in general 779 lymphedema patients underwent complex treatment (CDT). Therapeutic outcomes were based on regular checking, seminars focused on patient's adherence in long-term treatment activities incl. self-treatment and specialized questionnaire evaluation. Collected knowledge evoked consequential cognitions. The most frequent negative factor influencing patients' psychological condition seems to be depression with subsequent anxiety. Depression is based on broken body-image, limitations in dressing, problems in family and partner's relation (incl. sexual life), limited social interactions and others. These factors decrease significantly patient's quality of life. The onset of depression and anxiety starts a lack in patient's active participation in treatment program as well as self-care resulting in worsening of lymphedema. Depression and anxiety need a special treatment – conventional psychotherapy on its own is insufficient. Rational psychopharmacological approach (anti-depressive and anxiolytic drugs medication) must be integrated into patient's complex treatment (in cooperation with psycho-specialist). The onset of depression seems to be very often unrecognized by "somatic" doctors from specific reasons: (1) signals of early signs of depression are often qualified as a lack of will, laziness, hypersensibility or hysteric reaction and, (2) lymphologist might underestimate the fact, that depressive symptoms may manifest themselves not only in "verbal sphere", but also "nonverbally" and, therefore, might be easily overlooked. Depression strikes the patient! He becomes passive, apathetic and ignores the treatment daily-régime. So, a "vicious circle" starts: depression ... increasing patient's passivity ... decreasing treatment effort ... progression of lymphedema ... worsening of depression.

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## CYSTIC ADVENTITIAL DISEASE OF THE POPLITEAL ARTERY

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Cystic adventitial disease of the popliteal artery is a rare and benign disease. Over three hundred cases of cystic adventitial disease were collected from over two hundred world literatures and were classified into two groups: first, typical cystic adventitial disease of the popliteal artery, and second, that of the stem vessels in extremities other than popliteal artery. The appearance of claudication in a young male non-smoker and the typical angiographic findings usually confirm

the pathology. The treatment of choice is incision evacuation of the cyst. A saphenous by-pass graft provides a good alternative if incision evacuation fails to restore good peripheral pulses. From the etiological point of view, the group in which the cyst was connected with joint capsule was identified as the joint group.

## ACUTE ARTERY OCCLUSION OF LOWER LIMB AS A FIRST SIGN OF POLYCYTHEMIA VERA

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Authors report a case of 36-year-old man with no prior medical history who presented to emergency department with pain in his left lower limb. The patient was smoker and his medical history was unremarkable. On examination, there was no edema of the legs, no sign of trauma, and both the dorsalis pedis and posterior tibial artery were palpable. The patient underwent venous ultrasonography which showed no sign of deep venous thrombosis. The diagnosis of muscle distension was established, the patient was recommended to administer NSA drug on demand and was sent home. The next day the patient presented to emergency department with cold skin and pain in his left lower limb. On examination, pulses in the lower limb were present as day before, but skin was cold in this region. Computed tomographic angiography showed acute arterial occlusion of the proximal dorsalis pedis and the distal peroneal artery. A mural thrombosis of an apparently normal abdominal aorta was the cause of the peripheral embolism. Anticoagulation therapy was initiated, and the patient was discharged home in stable condition. As polycythemia was found in ambulatory control blood sample, he was referred to hematologist for further assessment that established diagnosis of polycythemia vera. The patient is seen for follow-up exams in hematology, is on oral warfarin and is treated with phlebotomy. The follow-up CT scan revealed no thrombosis of abdominal aorta.

## DENSITOMETRY – A NEW MODALITY FOR DETECTION OF AORTIC CALCIFICATION

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**Background:** The presence of abdominal aortic calcification (AAC) is an established risk factor for cardiovascular disease. AAC correlates with total atherosclerosis burden. Instant vertebral assessment (IVA) using single-energy X-ray



absorptiometry can visualize abdominal aortic calcification. We questioned whether IVA-densitometric method could be used for AAC assessment.

**Methods and Results:** We enrolled 54 women with mean age 62.3 (range 45–91) years. Lateral IVA images of the lumbar spine were obtained and scored for AAC using a validated 8-point scale. Patients with a score of 3 or more in AAC-8 are considered at risk for cardiovascular diseases. IVA images showed that 39 (72.2%) of the participants did not have any detectable AAC, whereas the prevalence of significant atherosclerotic burden, defined as an AAC score of  $\geq 3$ , was 6 (11.1%).

**Conclusions:** Instant vertebral assessment (IVA) may provide a useful tool to detect abdominal aortic calcification. IVA's main advantages are low radiation dose and short exam time.

### VASCULAR CALCIFICATION – PATHOPHYSIOLOGY AND CLINICAL IMPORTANCE

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Vascular calcification is associated with increased risk of myocardial infarction, limb amputation, and morbidity after vascular surgery. Population ageing, metabolic syndrome, chronic kidney disease and diabetes mellitus are accompanied by an increased prevalence of extraosseous calcification, mainly in the aortic valve region and arterial walls.

Vascular calcification occurs at two anatomic sites: in the intima, where it is invariably associated with atherosclerosis, and in the tunica media, e.g. mediocalcinosis. Calcification of the media of peripheral arteries is referred to Monckeberg's sclerosis and occurs commonly in aged and diabetic individuals.

In our study a group of diabetics with X-ray examination verified mediocalcinosis of lower limb arteries was investigated. In this group of the patients there was high frequency of diabetic neuropathy and approximately 50% patients had in the history or at the present time ulcers or gangrene of leg.

In the second group we investigated retrospectively patients with amputations of legs. All diabetics had the manifestations of diabetic neuropathy and the great part of them had the symptoms of diabetic foot with mediocalcinosis.

It looks like that mediocalcinosis of arteries of lower extremities is very unfavorable factor in prognosis of diabetics.

### PROGNOSTIC VALUE OF CAPILLAROSCOPY IN SCLERODERMA PATIENTS LONG-TERM FOLLOW-UP OF 234 PATIENTS

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Nailfold capillaroscopy is known as a sensitive and specific test for the diagnosis of systemic sclerosis in patients with Raynaud phenomenon. Hildegard Maricq also suggested that two different capillaroscopy patterns with different prognostic significations could be differentiated: the active pattern, with predominant capillary destruction and disorganization, and the slow pattern, with giant capillaries and a smaller decrease in capillary density. The systematic recording of capillaroscopy patterns in all patients with systemic sclerosis in our center since 1982 allowed us to evaluate the prognostic value of this classification in a retrospective study.

**Patients and Methods:** Patients validating the ACR (1980) or the LeRoy criteria for systemic sclerosis who benefited from a capillaroscopy between 1982 and 2007 and a follow-up of at least three years in our centers were included. Classification in slow or active patterns was performed blindly from the report of their first capillaroscopy examination. Follow-up data were obtained from the hospital records in these patients who were systematically evaluated on a yearly basis. When no information was available for more than one year, a phone interview of the patient or his attending physician allowed the collection of the outcome. Prognostic value of the capillaroscopy patterns was tested using the Kaplan-Meier survival analysis for the prediction of global survival, survival without significant new visceral involvement, and survival without digital ulcer.

**Results:** 234 patients (201 women and 31 men) were included. Their mean age at inclusion was  $52 \pm 15$  years; 18 had a diffuse cutaneous systemic sclerosis (dcSSc), 105 a limited cutaneous systemic sclerosis (lcSSc) and 111 a limited systemic sclerosis (lSSc). Nine patients (3.7%) had a normal capillaroscopy pattern, 174 slow scleroderma pattern (74.5%) and 51 (21.8%) an active scleroderma pattern. The mean duration of follow-up was  $9.8 \pm 4.9$  years; during this follow-up, 47 patients died (20.1%), 59 suffered from the onset of a new significant visceral involvement and 37 experienced new digital ulcers. Kaplan-Meier analysis showed a significant difference between the two capillaroscopy patterns for the three prognostic criteria: mortality ( $p < 0.001$ , with 20 years survival rates of 48% with the active pattern and 80% for the slow pattern), the survival without new visceral involvement ( $p < 0.001$ ) and the survival without digital ulcer ( $p = 0.034$ ).

**Conclusions:** These results confirm that, in addition to its diagnostic value, nailfold capillaroscopy also provides interesting prognostic information in patients with systemic sclerosis.



**KAZUISTIKY  
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## INFECTED THROMBOSIS

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Infected thrombosis is a serious medical condition requiring targeted antibiotics and anticoagulation therapy. Our case report concerns 36-year-old man with the basic diagnosis Crohn's disease. The patient with chronic immunosuppressive therapy was indicated for ileocecal resection because of high disease activity. The central venous catheter was placed into the right internal jugular vein on the operation day. The septic condition occurred the fifth post-operative day, the source was an infected thrombus in the right jugular vein, extending into subclaviobrachial region and also in the upper part of the right brachiocephalic vein. The situation was further complicated by the right side basal bronchopneumonia. The *Staphylococcus aureus* was diagnosed from repeated blood cultures and from the tip of the catheter as well.

The patient was treated with a combination of antibiotics and simultaneously was anti-coagulated with the therapeutic dose of LMWH. His chronic medication, corticosteroids and azathioprine, were interrupted, the patient has been treated only by mesalazin. Duration of antibiotic treatment was repeatedly discussed. We used the same recommendation as there are for *Staphylococcus aureus* bacterial endocarditis. Infection markers and chest X-ray was completely normalized after four weeks of antibiotic treatment. Anticoagulation will be carried out for at least six months as recommended. The patient will regularly undergo an ultrasound scan.

## VENOUS INSUFFICIENCY – THE KNOWN AND UNKNOWN

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The author devoted her lecture to the pathophysiology, symptomatology, diagnosis and treatment of chronic venous disease.

The pathophysiology of chronic venous disease is mainly venous inflammation, which causes damage and valvular incompetence leading to reflux and venous hypertension.

In chronic venous diseases, connective tissue changes occur in the walls of varicose veins. The results of various studies point to the importance of adherence of leucocytes to the venous walls as well as changes in the walls of the affected veins. These changes lead to inflammation and cascade of other processes ultimately causing disease chronicity. In the varicose veins, longitudinal and circular smooth muscle bundles of the venous wall are separated. It was shown that venous wall thickness varies in different sections of a varicose vein. In patients

with chronic venous insufficiency activated neutrophils were detected in peripheral blood. Although it is not clearly known what plasmatic factors can induce neutrophil activation, such activators are obviously important in the pathogenesis of primary venous dysfunction and development of chronic venous insufficiency, and also they also play a role in the formation of venous ulcer. After this activation the neutrophils migrate into the venous endothelium and there is production of toxic metabolites and free oxygen radicals. In the walls of varicose veins was also demonstrated imbalance between matrix-metalloproteinases and their inhibitors. It causes destruction and morphological changes of valves and weakening of the venous walls. Inflammatory interactions of leukocytes and the endothelium play a crucial role in the development of venous dysfunction, followed by subsequent development of the venous insufficiency and reflux and development of varicose veins. These factors are particularly important in terms of implementing appropriate treatment where a major role is played by venopharmacs.

Extremely important is the patient's history, focusing in particular on the subjective symptoms, and family history. The patients report in the first stages of the disease feelings of tension in the legs, cramps, sometimes burning sensation and especially oedema of the ankles following exertion. Later, the patients develop skin changes; persistent oedema and 1% of patients develop venous ulcers.

The diagnosis is based on the correct classification of the disease stage in the CEAP classification and imaging methods, such as Duplex ultrasound and plethysmography.

The basic treatment modalities include – conservative and surgical treatment. The basic pillar of the therapy of the venous disease is wearing compression stockings or proper use of elastic bandages, as well as lifestyle changes, use of venopharmacs and topical treatment. The mini-invasive methods include sclerotherapy – foam or liquid, and other options, according to the extent of the disease, include various surgical methods.

## PHOSPHOROUS IN VIVO MR SPCTROSCOPY AND ITS MEDICAL APPLICATIONS

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Magnetic resonance (MR) has become an important diagnostic tool in biomedicine. Besides MR imaging that gives us mainly morphological information, in vivo MR spectroscopy enables non-invasive observation of biochemical pathways in the living tissue. Not only protons (<sup>1</sup>H) but also other isotopes (i.e. <sup>31</sup>P, <sup>13</sup>C, <sup>23</sup>Na, <sup>19</sup>F, etc.) are often used for MR spectroscopic examination. To enable usage of non-proton MR spectroscopy, it is necessary to equip the MR scanner with a multinuclear unit that results in limited availability of these techniques. Another problem is low sensitivity in comparison to proton MR imaging and spectroscopy.

Very useful method for clinical applications is phosphorous ( $^{31}\text{P}$ ) MR spectroscopy. It enables the observation of energy phosphate metabolism and intracellular compartmentation through the signals of phosphomonoesters, phosphodiester, inorganic phosphate and nucleotide triphosphates, mainly adenosine triphosphate. The last typical signal of  $^{31}\text{P}$  MR spectra *in vivo* is phosphocreatine. Although it is a dominant signal in muscles, it is not readily observable in spectra of the liver because of its low contribution to hepatic metabolic processes. In addition, pH values,  $\text{Mg}^{2+}$  concentration and other parameters can be calculated from the metabolite signal positions.

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## VENOUS THROMBOEMBOLISM IN SENIORS – IN THE CONTEXT OF POLYMORBIDITY

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**Background:** Venous thromboembolism (VTE) occurs across generations. It affects the young as well as the seniors. VTE is a disease of aging, with a low rate of about 1 per 10,000 annually before the fourth decade of life, rising rapidly after age 45 years, and approaching 5–6 per 1,000 annually by age 80. The VTE risk factors typical for seniors that contribute to the increase of VTE incidence are following: 1. age alone, 2. cancer, 3. anti-tumor therapy, 4. injury, 5. immobilization.

**Methods:** 219 patients with VTE were followed in last six years by the Outpatient Department of Angiology. Phlebothrombosis was diagnosed by color duplex ultrasound and pulmonary embolism was diagnosed by CT pulmoangiography or ventilation/perfusion lung scan.

Observed risk factors: family history of VTE, all patients underwent genetic analyses of inherited thrombophilia: factor V Leiden G1691A, factor II G20210A, MTHFR C677T, MTHFR A1298C. Following secondary risk factors of VTE: malignancy, trauma, surgery undergone less than 5 weeks prior to VTE, using of hormonal contraceptives, pregnancy, hormonal replacement therapy or hormonal anti-cancer therapy, chemotherapy, radiotherapy, travelling, immobilization, inflammatory disease. Within educational part of study we interviewed patients if they were able to explain the principle

of phlebothrombosis, principle of pulmonary embolism and how many risk factors of VTE they were able to list.

**Results:** 100 (45.7%) of them were men and 119 women (54.3%), from 21 to 90 years. 20,55% of followed patients were 21–45 years old. 40,18% of patients were 66–90 years old. 21.6% of seniors and 13.3% of young adults underwent pulmonary embolism, difference is not statistically significant (Fisher's exact test with  $p=0.476$ ). We identified recurrence of VTE in 52.3% of seniors and 28.9% of young adults, difference is statistically significant ( $p=0.018$ ). 42.2% of young adults and 28.4% of seniors in our study group had more important thrombophilia mutations, difference is not statistically significant ( $p=0.336$ ). 11.4% of seniors and 22.2% of young adults reported VTE in relatives, difference is not statistically significant ( $p=0.113$ ). 34.1% seniors had malignant disease but only 4.4% of young adults, difference is statistically significant ( $p<0.000$ ). 17.0% of seniors and 24.4% of young adults underwent VTE in the context with trauma (we did not discriminate the kind of trauma), difference is not statistically significant ( $p=0.589$ ). 11.4% of seniors and 8.9% of young adults underwent perioperative VTE, difference is not statistically significant ( $p=0.575$ ). 31.1% of young adults and 4.5% of seniors underwent VTE regarding to use of hormones, difference is statistically significant ( $p<0.000$ ). 4.4% of young adults and 4.5% of seniors underwent VTE regarding to travelling, difference is not statistically significant ( $p=0.426$ ).

Young adults achieved higher education than seniors. 53.3% of young adults achieved secondary education, 37.8% of young adults achieved higher education as compared with 34.1% and 22.7% of seniors, difference is statistically significant ( $p<0.000$ ). Patient knowledge about principle of VTE and about risk factors was studied by questionnaire. We expected better knowledge of young adults of the principle of the disease. 93.3% of young adults and 79.5% of seniors were able to explain the principle of venous thrombosis, difference is statistically significant ( $p=0.057$ ). We had same assumption for patient knowledge of the principle of pulmonary embolism, it was confirmed ( $p<0.000$ ). 48.9% of young adults but only 28.4% of seniors could explain the principle of pulmonary embolism. 17.8% of young adults and 48.9% of seniors were unable to specify neither risk factor of VTE. Young adults named in most cases two risk factors (40%). 82.2% of young adults and 51.1% of seniors named at least one risk factor of VTE. This difference was statistically significant ( $p=0.008$ ).

**Conclusions:** We have confirmed that the presence of secondary risk factors in the elderly is more pronounced than in young adults. Lower education, lower availability of modern communications technology seem to be a disadvantage for seniors, therefore they appear to be the target group for personalized forms of education in the community.



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## CYSTIC ADVENTITIAL DISEASE OF THE COMMON FEMORAL ARTERY

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**Purpose:** To summarize current knowledge about the etiology, presentation, diagnostics and treatment of cystic adventitial disease with the addition of a new case from our medical institution.

**Case report and Methods:** A 40-year-old man, a previously completely healthy non-smoker, presented with an approximately two-month history of rapidly progressing intermittent claudication in the left thigh and calf with a symptom-free interval of 30 meters. MRA and duplex ultrasound proved an isolated finding in the lower limb arteries – a cyst in the wall of the left common femoral artery approximately 3 cm in length, leading to a smooth, hemodynamically significant stenosis. Surgery proved CAD, the affected adventitia was resected circumferentially around the entire vessel wall app. 8 cm in length. The normal diameter of the artery was restored and the pulse to the periphery of the limb was preserved. The histological examination of the cyst wall showed a chronic fibroproductive inflammation. The postoperative course was uneventful. Five months after the surgery the patient is symptom free and without duplex ultrasound findings of recurrence, stenosis or dilation of the operated artery.

Information about this new case is presented together with that on the relevant publications obtained from Pubmed database.

**Conclusions:** CAD is a rare vascular condition but it must be considered in the differential diagnosis above all in middle-aged male patients without evidence of atherosclerotic disease in whom intermittent claudications develop suddenly with a rapid progression or with a fluctuation in severity. A large vessel near a joint is affected, most frequently the popliteal artery – in up to 85% of cases. MRA together with duplex ultrasound are the methods leading to accurate diagnosis. Surgery is treatment of choice (either evacuation with the removal of the cystic wall or resection and grafting).

## COMPLICATIONS OF TEVAR AND THEIR LATE OUTCOMES

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**Objective:** TEVAR is becoming more and more popular in treating diseases of the thoracic aorta.

**Methods:** We have performed 142 TEVAR procedures. 74 patients had hybrid procedures at the aortic arch, 68 underwent stentgraft implantation of the descending aorta. Total

arch debranching in 24, intercarotid by-pass in 22 and transposition of the left subclavian artery in 28 patients were performed.

**Intraoperative complications** occurred in 6 patients. One dissection of the ascending aorta due to partial clamping for side to end of a bifurcated graft. The patient using CP by-pass got interposition graft of the ascending aorta from which the total arch debranching was done. One severe bleeding was experienced from the stump of the left subclavian artery during S-C transposition needed expeditious thoracotomy to oversaw it. In one patient proximal fixation of an endograft in landing zone to did not succeeded properly and due to its distal shifting proximal extension was necessary.

Three cerebral embolisation were recorded during arch hybrid procedure – all in shaggy aortic arch – two healed completely. One patient has permanent partial blindness.

**Early complication:** In one patient the left limb of a bifurcated graft to the common carotid artery occluded without symptoms and diagnosed at the control CTA two days after procedure. Successful thrombectomy was performed. A septic patient with penetrating aortic ulcer three days after successful endografting of the descending aorta had rupture of the stomach passed away.

**Late complications** were recorded in two patients. One had slowly growing perigraft aneurysm due to type two endoleak at the descending aorta and was treated successfully by thoracotomy two years after endografting. In one old patient 11 years after arch hybrid procedure huge aneurysm developed proximally to the endograft and included the ascending aorta. The high risk patient refused any reintervention and died 3 months after diagnosis.

**Results:** All intraoperative and early complications were managed successfully but two. Two of cerebral microembolisations healed completely, one has persisting partial blindness.

One late complication of expanding aneurysm sack had successful surgery, the other died refusing reintervention.

**Conclusion:** Although TEVAR has reduced surgical trauma significantly the severe pathology of the thoracic aorta and technical difficulties may lead to early and late complications. Careful early and late controls are needed to detect and treat them in time.

## CHANGING THE VIEW OF THE SERIOUSNESS OF "NON-THROMBOGENIC" THROMBOPHILIA?

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The motto of my paper is not to set clear criteria, limits, but ask questions and contemplate.

In the course of the last years following factors have identified by the hematologist as being relevant thrombogenic factors: f. V. mutations, Leiden and APC resistance. The other



five commonly examined thrombophilic mutations are considered irrelevant or not significant thrombogenic risk factors in the development of phlebotrombosis (FT). During the daily work of the vascular clinic, I have been amazed by the frequent presence of "non-thrombogenic" irrelevant thrombophilia in diagnosed femoro-popliteal (FP) thrombosis patients.

In 2014, I have noticed that during the recanalization of obliterans femoro-popliteal phlebotrombosis (FP FT), the septum is often present, dividing the longitudinal course of the lumen of deep venous system of the legs in the areas affected by phlebotrombosis.

During 2014, I have identified septum in 46 cases within femoro-popliteal phlebotrombosis in our clinic.

Group: **46 patients (limbs), 30 men, 16 women, average age 61 years**, phlebotrombosis in **26 cases localized FP**, 7x P, 2x F, **septum in 27 cases of popliteal (P)**, 13 F, 7x FP.

**Congenital thrombophilia confirmed in 36 cases (80%)**, 2x thrombophilia excluded, 8x uninvestigated.

Out of the 36 cases of confirmed thrombophilia: **10 "relevant"** (9x f. V. Leiden, 1x APC resistance) **26 cases of "irrelevant" thrombophilia**.

**Out of the 26 cases of "irrelevant" thrombophilia: in 17 cases *restitutio ad integrum* (RAI) achieved**, recanalization of thrombosis in 9 cases until now.

**The average duration for achieving RAI: patients "irrelevant" thrombophilia and sept. vein 7 years.**

**3.3 years within the control group of patients with phlebotrombosis without septum.**

We have verified that the **average time to reach the RAI** in patients with thrombosis in phlebo-irrelevant thrombophilia and **septum was significantly longer than patients without septum** on significance level  $\alpha=0.05$ . ( $W0.05=\{t;t<-1.64\}$ )

Finally, I beg to ask three questions that I can not clearly answer:

**1. Are the "irrelevant" thrombophilic states in real life "relevant"?**

**2. Is the presence of septal property, combined with non-thrombogenic thrombophilias a decisive thrombogenic factor?**

**3. Is the septum the only decisive thrombogenic factor for FP FT?**

## EMERGENT CAROTID THROMBECTOMY AND ENDARTERECTOMY FOR ACUTE SYMPTOMATIC OCCLUSION OF THE INTERNAL CAROTID ARTERY AS A RESCUE THERAPY AFTER FAILED INTRAVENOUS THROMBOLYSIS

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Acute ischemic stroke due to internal carotid artery (ICA) occlusion has a poor prognosis and optimal treatment remains unclear. The early attempts to restore blood flow with carotid endarterectomy often ended with catastrophic results, most likely due to postoperative intracranial hemorrhage. Emergency endarterectomy and thrombectomy of the occluded ICA has not been investigated as an option of rescue therapy to preserve perfusion of viable brain and salvage ischemic but not yet infarcted brain.

Thrombolysis with recombinant tissue plasminogen activator is effective in improving clinical outcome in the treatment of acute ischemic stroke. However, intravenous thrombolysis results in low recanalization rates particularly in the event of internal carotid artery occlusion. Partial or complete recanalization following thrombolysis only occurs in approximately 10% of occluded internal carotid arteries. Additionally thrombolysis up to 6 hour after the onset of stroke has been found to increase the risk of postoperative symptomatic and fatal intracranial hemorrhage even after the clearance of alteplase.

We present two cases with severe acute stroke due to ICA occlusion where emergent carotid artery endarterectomy and thrombectomy was performed within 120 and 85 minutes after failed intravenous thrombolysis.

## THROMBOPHILIA TESTING IN SELECTED AND NON-SELECTED PATIENTS WITH VENOUS THROMBOEMBOLISM

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The last IUA (International Union of Angiology) Guidelines recommend thrombophilia testing after the first event of venous thromboembolism (VTE) only in selected cases. Patients older than 40 years with a provoked event and all above 60 should not be tested. However, rigid compliance with these selection criteria may theoretically cause missing a significant disorder. We compared the results of thrombophilia workup in 544 patients after the first VTE, meeting or not meeting the proposed selection criteria. We performed molecular genetic and coagulation assays and ELISA for antiphospholipid antibodies. Moreover, we focused also on strong thrombophilia (homozygous factor V Leiden or prothrombin gene mutation, protein C, S or antithrombin deficiencies, antiphospholipid syndrome or combination of  $\geq 2$  thrombophilias).

In the patients above 40 (n=416), the prevalence of thrombophilia was 25.4% in provoked events and 28% in unprovoked events (p=0.55) and the prevalence of strong thrombophilia 7.3% and 8.8%, respectively (p=0.59).

In the patients above 60 (n=243) and under 60 (n=301), thrombophilia was found in 27.6% and 29.2%, respectively (p=0.67) while the prevalence of strong thrombophilia was 9.1% and 4.7%, respectively (p=0.041).

Factors associated significantly with positive thrombophilia finding were positive family history of VTE (including superficial vein thrombosis) – OR 1.80; 95% CI 1.71–2.77 and proximal location of deep vein thrombosis (DVT) – OR 1.94; 95% CI 1.25–3.02.

In conclusion, in the group of 544 patients with a first VTE event, thrombophilia (including strong thrombophilia) in subjects above 40 years of age was found almost equally in provoked and unprovoked cases. Prevalence of thrombophilia was similar in the patients under and above 60 while strong thrombophilia was even more frequent in those above 60. In the whole group, thrombophilia was significantly associated with positive family history and proximal DVT location.

### THE ENDOVASCULAR REFLUX-ELIMINATION OF PERFORATING VEINS WITH RFITT AND FOAM SCLEROTHERAPY

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**Introduction:** During the last years, many endovascular techniques have been developed in order to eliminate not only the reflux in stem veins but in perforators and their tributaries, too.

**Aim:** The aim of this study was to use endovascular RFITT and the foam sclerotherapy for the occlusion of perforators as the prime source of reflux and their tributaries.

**Material and Methods:** The Celon method was used for the thermal treatment. Polydocalon with the concentration 1% and 2% was used for the foam sclerotherapy. The RFITT was accomplished in 127 perforators in total. This group was divided into 3 subgroups. The first one consists of patients where only RFITT was carried out – n=41, in the second, there were the patients with RFITT realized with sclerotherapy during one session – n=48, in the third, RFITT was completed with sclerotherapy in 1 month after the RFITT intervention – n=38. The control group included perforators treated only with sclerotherapy – n=81. The CelonProSurge micro and Celon ProCurve probe were used for the RFITT.

**Results:** The effectiveness of the procedure in the first group was 87.8%, in the second group 93.7%, in the group three 92.1% and in the control group 76.5% in one year follow-up. There was no significant difference between the effectiveness in groups 1, 2 and 3. The marginal difference was among all three groups with RFITT and the control group. Significant differences were in the parameter of the extinction of visible varicose veins with the reflux from perforators. The extinction was faster in group 3 than in group 2 and in the control group

and the slowest was in group 1. The significant difference was observed between groups 2 and 3 compared with group 1 and the margin difference was between groups 2 and 3 compared with the control group.

**Conclusions:** All procedures are effective. The most important is the combination of RFITT and the sclerotherapy one month after thermal intervention.

### DETECTION OF AUTOIMMUNITY IN VASONEUROSES (RAYNAUD'S PHENOMENON) IN 24-MONTH FOLLOW-UP

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**Aim:** Prospective study of random group of 216 patients with symptoms vasoneuroses. Statistical analysis of the occurrence of autoantibodies and contribution angiological examination in the diagnosis of autoimmune conditions.

**Method:** 216 patients (165 women, 51 men) with vasoneuroses (mostly Raynaud's phenomenon) were tested and monitored for at least 24 months. Was evaluated by duplex ultrasound and plethysmographic examination, clinic, anamnesis data, laboratory and immunological findings. Autoimmune antibodies was monitored 21 types. In 2-year period, patients were examined on an average of 3 times. Data were processed by statistical program PAST 3.0.

**Result:** Autoimmune disorders were during the 24-month observation period diagnosed in 43% of cases compared with 29% detected during the initial examination. The highest probability of detection (p<0.05) were labor. tests for ANA, ANAblot, antiENA and RF, the SS-A / Ro and Scl70. Capillaroscopic pathological finding was statistically significant (p<0.02), an indicator of the probability of occurrence of autoimmunity. Standard angiology examination and plethysmography were not statistically significant (p<0.3) useful for diagnostics.

**Conclusion:** In a random sample of patients with vasoneuroses revealed a significant increase in seizures of autoimmunity during the 24-month follow-up. Beneficial for diagnosis was capillaroscopic examinations, and ANA, ANAblot, antiENA and RF, SS-A / Ro and Scl70 analyses.

## NEAR-INFRARED SPECTROSCOPY FOR THE DETECTION OF LIPID RICH ATHEROSCLEROTIC PLAQUES: POSSIBLY A USEFUL TOOL FOR OPTIMIZATION OF CAROTID ARTERY STENTING

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**Introduction:** Intravascular near-infrared spectroscopy is an invasive imaging modality that has recently been validated for the detection of lipid rich atherosclerotic plaques in the coronary arteries. The method has many possible applications, which include detection of vulnerable atherosclerotic plaques prior to their rupture, prevention of distal embolization of lipid debris during interventions, optimization of stenting and adjustment of pharmaceutical therapy. This presentation aims to summarize the current knowledge in the field and evaluate options for its future applications in carotid interventions.

**Text:** Near-infrared spectroscopy (NIRS) is a technique that is capable of determining the chemical composition of substances based on the different absorbance of near-infrared (NIR) light. Every substance has a characteristic pattern of absorbance as if it had its specific NIR fingerprint. A catheter that combines intravascular ultrasound (IVUS) with NIRS (TVC Imaging System, InfraReDx INC., Burlington, MA) has recently been developed for the identification of atherosclerotic plaques that contain lipid rich cores. The method has already been validated and used in many coronary artery cases and a number of possible applications has been found. Our team recently published the first case of the use of NIRS in carotid artery stenting (CAS). We believe that the possible applications of NIRS in CAS may be analogous to those found in the coronary arteries. The detection of emboli-prone carotid plaques by NIRS prior to intervention may improve risk stratification of patients and thereby assist in the selection of CAS versus carotid endarterectomy. This is a choice that often depends upon the relative risks of the two procedures. The knowledge of lipid core plaque location may assist in placement of stents, and the choice of a distal or proximal protection device. The compositional information might also help with the adjustment of pharmaceutical therapy.

**Conclusion:** Near-infrared spectroscopy is a useful novel diagnostic tool. Here, we provide insight into this issue and summarize the possible applications of NIRS in carotid interventions.

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## TOTAL MORTALITY AND PLASMA CHOLESTEROL LEVELS. CZECH HAPIEE STUDY

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Based on the results of studies performed over forty years ago, the high levels of plasma cholesterol are considered to be a risk factor for cardiovascular and total mortality. However, data's from large studies of the third millennium are sparse and controversial. We followed a link between plasma levels of total and LDL-cholesterol and an eight-year mortality (total, cardiovascular and cancer) in a sample of 6.653 individuals (age range 49–65 years; 627 deaths, including 233 from cardiovascular disease and 283 from cancer) of Czech studies HAPIEE. The lowest total and cardiovascular mortality ( $p=0.01$ ) were associated with total cholesterol levels between 5.15 and 6.18 mmol/L. Cancer mortality was highest ( $p=0.01$ ) in the group with total cholesterol 5.15 mmol/L or less. Analysis of LDL-cholesterol showed similar results. Adjustment for dyslipidemic treatment did not change the results. All relationships exhibit the typical “U” shape curve. The results from the HAPIEE study do not support the assertion, that elevated levels of total and LDL-cholesterol levels are linearly associated with a higher total and cardiovascular mortality.

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## EXTERNAL ILIAC ARTERY ENDOFIBROSIS

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Endofibrosis of the external iliac artery is an uncommon disease affecting primarily young, otherwise healthy, endurance athletes. External iliac artery endofibrosis is an uncommon condition first described in 1984. We report two unusual cases of external iliac artery endofibrosis in cyclists treated. Resected arterial segments displayed a variety of histopathological changes including intimal thickening, medial hypertrophy and inflammation, calcifications, adventitial thickening and luminal thrombi. There is increasing recognition of this condition as an unusual cause of lower limb pain in athletes, particularly cyclists. The published series demonstrate a wide range of pathological appearances, highlighting the need for pathologists to be aware of this entity and its characteristic clinical features, as well as the spectrum of possible

histological changes. This case highlights an unusual finding in association with external iliac artery endofibrosis and provides an opportunity to briefly review the literature on the subject.

### THROMBOLYTIC TREATMENT OF DEEP VEIN THROMBOSIS – ANALYSIS OF FILE

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**Introduction:** Ileo-femoral thrombosis is serious disease which might be complicated by the pulmonary embolism with lethal consequences or if it is treated late and incorrectly the patient might suffer from postthrombotic syndrome. Deep vein thrombosis of upper limbs and neck is also serious disease especially in case of patient in terminal kidneys failure with limited options of access to dialysis. The effective treatment of those thrombosis is the thrombolysis, which has its indications and contraindications, which must be followed.

**Aim:** The retrospective analysis of file of patients who underwent thrombolysis of deep veins from 2009–2014.

**Methods:** Evaluation of therapy success in risk factors of thrombosis in file of patients with deep vein thrombosis treated by thrombolytic therapy.

**Results:** In 2<sup>nd</sup> Department of Surgery of University Hospital in Olomouc 42 thrombolysis were performed 2009–2014 because of ileo-femoral thrombosis and 1 because of deep vein thrombosis of upper limb and neck. 36 patients suffered from thrombosis in left leg, 7 patients in right leg. In file there were 30 women and 13 men with average age 36.3 years. The average length of symptoms was 4.3 days. We focused on risk factors of the thrombosis. The thrombophilic status was found in 28 patients. In 38 patients full recanalization was achieved.

### EXTRACRANIAL ANEURYSM OF THE INTERNAL CAROTID ARTERY – CASE REPORT

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Aneurysms of the extracranial carotid arteries are rare, with largely unknown incidence. Their surgical repair accounts between 0.2–5.0% of all carotid artery surgeries. We usually distinguish true and false aneurysms. While the true aneurysms are atherosclerotic origin, the pseudoaneurysms arise from trauma, post-carotid endarterectomy, infection, spontaneous dissection or local radiotherapy. Due to their risk of neurological complications or rupture if untreated, aneurysms should be repaired regardless of technique. Authors

present a case of the surgical treatment of a true internal carotid artery aneurysm in a woman manifested with pulsatile mass in her neck without neurologic symptoms.

### COMPARISON OF CLINICAL EFFECTIVENESS BETWEEN HYBRID APPROACH AND CONVENTIONAL METHODS OF TREATMENT FOR THROMBOSED ARTERIOVENOUS GRAFT FOR HEMODIALYSIS

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**Introduction:** In the Czech Republic, arteriovenous graft (AVG) is used as the last option for providing access to hemodialysis before central venous catheter. AVG creation is indicated only in patients with exhausted autologous subcutaneous venous circulation. The advantages of using PTFE grafts are short maturation time and multiple potential access sites. Their overwhelming disadvantage is their propensity for venous outflow stenosis. Most graft fail, due to stenosis on the venous outflow anastomosis, that can be managed surgically or by percutaneous methods with/without stent (PTA) or stent graft (SG) implantation.

**Purpose:** To compare influence on implantation SG for the treatment of thrombosed AVG associated to venous anastomotic stenosis after thrombectomy and thrombosed AVG after thrombectomy with PTA without SG to long-term patency.

**Results:** Between 1/2009 – 12/2014 73 AVG were performed. Throughout the follow-up were 35 AVG thrombosed. First group of 20 thrombosed AVG after thrombectomy underwent PTA or surgical patch or new anastomosis. Second group of 15 thrombosed AVG after thrombectomy underwent implantation of SG (Viabahn) for venous outflow stenosis. Secondary patency at 12 months in group without SG was 47,6% and 71,8% in group with SG.

**Conclusion:** Compared to AVG without implantation SG, SG implanted for venous anastomotic stenosis in thrombosed AVG provided better long-term outcome.

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## INTRAOPERATIVE ULTRASONOGRAPHY IN MODERN VENOUS SURGERY

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**Introduction:** The authors present their experience in the field of intraoperative ultrasonography (IU) in venous surgery. Nowadays we cannot imagine performance of the endovenous thermal ablation without using Doppler ultrasonography. In this presentation we point out another approaches of intraoperative ultrasonography in open venous surgery.

There are some situations during open venous surgery when we can use Doppler ultrasonography. The most common situation is in ligation of insufficient accessory lateral vein, when IU finds exactly the position of the vein and surgeon can lead incision directly above the vein. The great saphenous vein is preserved in these case. It takes shorter time, smaller incision, than in open surgery. Every surgeon can get into difficult situation, when cannot find a sapheno-femoral or sapheno-popliteal junction or it takes very long time. It is became more frequently in overweight patients. It is clear, there is increasing risk of complications such as injury of lymphatics or deep veins system.

**Conclusions:** IU brings smaller incision, shorter operating time and more safety than without IU.

There are some disadvantages of these approaches. There is a need of portable ultrasonography machine in operating theatre, skilled doctor with Doppler ultrasonography.

This method is suitable for specialized departments in venous surgery.

## THE MISTAKES ASSOCIATED WITH SURGICAL TREATMENT OF ULCUS CRURIS VENOSUM

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The **aim** of the study is to show the mistakes have been connected with surgical treatment of *ulcus cruris venosum*. Despite the fact, that the surgical treatment of an insufficient superficial venous system patients with ulcer is an efficient method, and in case of high ligation is a gentle and cheap, remains too small number of operated patients.

New guidelines of Society of Vascular Surgery and American Venous Forum (2011) clearly showed, that the ablation of

the incompetent superficial veins is recommended in addition to compression therapy (Grade 1A).

We performed retrospective study operated patients from 2011–2014. We found out the reasons, why the patients with ulcer did not underwent surgical treatment earlier. The most common reasons were the worries from surgical infections of the incisions. The another reasons were deep veins thrombosis in history, age of patients, general anesthesia.

**Conclusions:** We found out, that there are many incorrect reasons leading to delayed surgical treatment. The surgical treatment of superficial venous system must be the basic part of health care patients in the early stage of *ulcus cruris venosum*. The method of choice are endovenous thermal ablations.

## ARTERIA BRACHIOMEDIANA SUPERFICIALIS

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**Introduction:** *Arteria brachiohumeral superficialis* is an extremely very rare variant of the upper limb arterial system. Anatomically, it is an *arteria humeral* branched proximally to the bifurcation of the *arteria brachialis* featuring a superficial course in the *regio brachii anterior*, *fossa cubitalis* and *regio antibrachii anterior*.

**Methods:** This contribution reviews in detail literature concerning the superficially coursing *arteria humeral* branched proximally to the *fossa cubitalis* and completes it with a new case report.

**Results:** It has been reported only twelve times in the last 100 years. However, the new case reported is combined with a variation of *musculus palmaris longus*, featuring two tendons with an interposed belly.

**Conclusion:** The knowledge of the arterial variant of the upper limb features high clinical relevance for the catheterization through the radial or ulnar artery, for the harvesting of the forearm artery as a graft, for the possible collateral circulation in cases of the arterial closure, for surgical management of the carpal tunnel syndrome or in case of an injury of the superficially located variant artery.

[www.geum.org/angio](http://www.geum.org/angio)

## TREATMENT OF SUPERFICIAL THROMBOPHLEBITIS OF THE LOWER LIMBS – ARGUMENTS TO SUPPORT PROPERLY TIMED SURGICAL INTERVENTION

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Lower limb superficial venous thrombosis (SVT) represents serious and dangerous disease. The thrombus (T) expansion into the deep veins system (DVS) in 5–44%, pulmonary embolism (PE) in 4–17%, and post-thrombotic syndrome in 5–44% of cases represent main threats for the patient. SVT recurrence rate was proved to be as high as 15–20%. DUS based diagnosis is essential, the exact T extension should be detected. The aim of treatment is to block the extension of the SVT into DVS, prevent PE, reduce the perivascular inflammation, and avoid SVT recurrence.

ANTICOAGULANT THERAPY prevents DVS progression of T, and PE only. T of GSV/SSV stays in situ. Varicose veins (VV) thrombosis recurrence rate remains 15–20%. Anticoagulant therapy (4–12 w.) was very expensive, the cost of LMWH being the highest. Nevertheless, clinical studies (POST, OPTIMEV) have shown the thromboembolic complications incidence of 10.2% (DVS thrombosis 4%) in follow-up of 3 months after LMWH based anticoagulant therapy.

SURGICAL TREATMENT offers options as follows:

1) Local surgical therapy by thrombectomy (TE) relieves pain immediately.

2) GSV/SSV ligation above the T head does not prevent the proximal T expansion up to, or above the sapheno-femoral junction (SFJ).

3) Simple SFJ ligation (without stripping and/or TE) does not forestall SVT recurrence.

4) Radical surgery under local anesthesia and LMWH protection is our method of choice since 1967. Properly timed crossectomy along with diseased vein TE meets all SVT therapy requirements.

Author's opinion was based on own experience with DUS diagnosis and surgical treatment of acute ascending SVT of GSV/SSV in 67 patients (in 2 bilateral). 69 operations were performed in 42 women, mean age 53.8 (36–83 y.), and 27 men – age 54.9 (40–73 y.). In 18 patients the T expanded as far as to SFJ. No perioperative complications, neither PE were detected.

**Conclusion:** Properly timed one session crossectomy and thrombophlebotomy prevents the T extension above the SFJ (e.g. avoids the threat of PE), relieves pain immediately, prevents SVT recurrence, avoids long term anticoagulation (most expensive article of therapy costs), avoids long term compressive therapy, reduces work incapacity time, and improves the quality of life.

Extensive SVT in pregnancy should be diagnosed and treated as an emergency according to our experience.

## EVOLVING ANTICOAGULANT STRATEGIES IN VENOUS THROMBOEMBOLISM

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Venous thromboembolism (VTE) is a relatively common disease with acute risk of death and potential long-term consequences in term of postthrombotic syndrome or chronic pulmonary hypertension. Anticoagulant therapy is the basic therapeutic procedure; thrombolytic therapy and the introduction cava filter are appropriately indicated for individual cases. In past few years, new direct oral anticoagulant drugs (NOAC) have occurred – Xa factor or thrombin inhibitors which have demonstrated the same efficacy and even higher safety in comparison to conventional treatment. In mid 2014, 3 drugs of this group are registered in Czech Republic – rivaroxaban (Xarelto), dabigatran (Pradaxa) and apixaban (Eliquis). These drugs have comparable efficacy and safety but they differ in schedule of dose administration. Rivaroxaban and apixaban can be administered immediately after diagnosis of venous thrombosis or hemodynamically stable pulmonary embolism. LMWH application has to precede few days the administration of dabigatran. Limitation of new drugs is their price. Unavailability of antidotes is temporary because current researches continue to find one for dabigatran and another for both of xabans. Duration of anticoagulant treatment after acute phase depends on the presence of thrombosis risk factors and the individual bleeding risk. Minimal duration of anticoagulant therapy is 3 months, commonly 6–12 months and in high risk patients it is “long term” treatment. Good results of new anticoagulant drugs in trials in term of thromboembolism recurrence prevention may change established habits in VTE patients with long term treatment.

## BALLOON ANGIOPLASTY +/- STENTING VS MEDICAL THERAPY FOR HYPERTENSIVE PATIENTS WITH RENAL ARTERY STENOSIS

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There is controversy about the value of correcting renal artery stenosis (RAS) by angioplasty with or without stenting in the management of patients with hypertension and/or deteriorating renal function, compared with optimal medical management. This debate arose after case reports and some small case series in the 1990s reported that correction of RAS by angioplasty or surgery led to clinical improvement in patients with severe uncontrolled hypertension and/or deteriorating renal function. More recently several randomised

controlled trials (RCTs) have failed to confirm the success of this treatment over medical therapy.

This paper analyses a recent Cochrane systematic review of RCTs, suggests subgroups in which the possibility of benefit from correction of RAS has not been excluded, and explores the problems of including such patients in RCTs.

## CONTROVERSIAL TOPICS IN THE DIAGNOSIS AND THERAPY OF VARICOSE VEINS OF LOWER EXTREMITIES

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Venous surgery is developing very fast last years and many techniques which were considered as "gold standards" some years ago have different alternatives now leading to same or even better results in diagnosis and treatment. It is the case of chronic venous insufficiency of lower extremities presenting mainly as varicose veins.

During the last Phlebological days with International Participation held in November 2014 in Hradec Králové, the discussion on different topics in this field was organised among participating specialists from different European countries. Six important themes were discussed:

What is the optimal procedure for ultrasound examination of the superficial venous system?

Local or general anesthesia in surgical management of varicose veins – what's better?

Saphenous ligation – is it still a golden standard procedure in the surgical treatment of truncal varicosis?

Optimal endovascular treatment of truncal varicosis – laser or radiofrequency?

Surgical treatment of calf perforators – is it really necessary?

Superficial varicophlebitis – conservative or surgical treatment?

Relapses of junctions – surgical revision or foam sclerotherapy?

Every session was followed by secret auditorium voting using electronic devices and this paper will present the most important arguments of specific speakers and the results of auditorium voting.

## RENAL DENERVATION FROM THE NURSE'S PERSPECTIVE

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Arterial hypertension is the most common cardiovascular disease affecting up to 35% of adults in developed countries.

Renal denervation represents a non-pharmacological treatment option of arterial hypertension. The principle of renal denervation is the use of radiofrequency energy to interrupt the sympathetic nervous pathways between the kidney and the brain, which leads to reduced activity of nerves responsible for arterial constriction and contribution to the development and persistence of severe hypertension. It is intended especially for people who are unable to achieve a long-term blood pressure control. It provides permanent reduction of blood pressure and risk of complications for patients with hypertension resistant to antihypertensive drugs. Renal denervation is therefore an opportunity to help patients with severe hypertension who do not respond to pharmacological therapy. The aim of this work is to provide nurses with information about the principles of renal denervation, evaluate the effectiveness of this method and focus on specific nursing care of the patient at the intensive care unit before, during and after the interventional procedure.

## TOBACCO DEPENDENCE – THE MOST OFTEN NEGLECTED CARDIOVASCULAR RISK FACTOR

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Tobacco dependence is one of the four major risk factors for cardiovascular disease. Even though this fact is generally known, health professionals do not pay enough attention to it and have lack of awareness about treatment possibilities.

According to World Health Organization, all health professionals should provide at least brief intervention to all patients. This includes following steps: ask about tobacco use, advice to quit and assist with cessation, in its shortest version, and should be implemented at each clinical contact. Such an intervention can last from several seconds up to several minutes, according to time possibilities of the provider. If the patient is not motivated to quit, motivational intervention should follow. In case of lack of skills/time to provide extended intervention, those motivated for quitting can be referred to one of 38 Centers for Tobacco-Dependent across the Czech Republic (see [www.slzt.cz](http://www.slzt.cz)), where treatment is covered by health insurance (except of pharmacotherapy).

Further aspects of tobacco dependence and its treatment in the Czech Republic will be discussed.

## PSEUDOANEURYSM OF THE PROFUNDA FEMORIS ARTERY

Kološová R.<sup>1</sup>, Kozák J.<sup>2</sup>, Pavlas I.<sup>1</sup>, Kučera D.<sup>2</sup>, Válka M.<sup>2</sup>

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True aneurysms of the profunda femoris artery are rare. We see pseudoaneurysms of the same artery more frequently. Their most common causes are damage of vessel wall following various types of injuries (blunt or penetrating injuries, femur fracture, orthopedic operations and catheterization). True aneurysm is usually caused by a vascular degenerative process.

We describe the case of 79-year-old man afflicted by painful, enlarging, pulsatile mass in his upper left thigh without any known preceding injury or invasive procedure. Doppler ultrasound and consecutive CTAG examinations were executed and revealed a left PFA pseudoaneurysm. Subsequent endovascular treatment was given in Centre of Vascular Interventions, Ostrava-Vítkovice with successful cure of PFA pseudoaneurysm with coil embolisation. Control Doppler ultrasounds showed regression of hematoma without proceeding perfusion.

It can be difficult to distinguish between true and false aneurysm in practice, as we show in our case report. Our patient had negative history of injury or interventional procedure. Furthermore, there were not seen any considerable degenerative changes of the vessels or aneurysms of the other arteries. On account of angiography the mass was evaluated as pseudoaneurysm and was successfully treated with endovascular coil embolisation.

## ENDARTERECTOMY OF THE COMMON CAROTID ARTERY IN ACUTE STADIUM – CASE REPORT

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Most of literature in carotid surgery is concentrated on internal carotid artery (ICA) and only few of articles are concentrated on common carotid artery (CCA). Research of literature in English language describe from 1965 till 2012 altogether 21 articles, including 146 patients. Authors describe about one symptomatic acute occlusion of common carotid artery in 76-year-old woman, which was operated in acute stadium of stroke. It was a thrombendarterectomy according to Vollmar performed. Immediate of the first day after surgery the neurological condition of the patient was advanced. After few days after surgery she was demitted in very good condition.

## DYNAMIC <sup>31</sup>P MR SPECTROSCOPY

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*In vivo* phosphorus magnetic resonance spectroscopy (<sup>31</sup>P MRS) is a non-invasive method suitable for the assessment skeletal muscle oxidative capacity during dynamic exercise-recovery challenge. Therefore, in the last decades, <sup>31</sup>P MRS has been used, to describe normal skeletal muscle physiology, training status and defects accompanying various muscular, systemic metabolic disease and cardiovascular diseases.

Although exercise-recovery <sup>31</sup>P MRS experiments are used in many institutions for a range of applications, the published data on metabolic capacity or oxidative fluxes in healthy volunteers and specific patient groups often differ between the sites. This discrepancy is usually referred to be caused by different study population, measurement protocol, data processing or equipment used. The inter-individual differences can, of course, play a major role in small studies, but their importance tends to decrease and should be eliminated in larger studies and diagnostic applications.

This lecture will describe the available RF-coils, MR-compatible ergometers, experimental set-up and data processing issues. Their use will be illustrated on different measurements on low and high magnetic field and optimal strategies for data acquisition and post processing will be discussed. Clinical applications with the focus on exercise physiology, diabetes mellitus and peripheral arterial disease will be reviewed.

## PROPHYLAXIS OF THROMBOEMBOLIC EVENTS IN CANCER PATIENTS

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Venous thromboembolism (VTE) is a major complication and the second leading cause of death in cancer patients. It occurs in 4–20% of oncological patients. The risk of VTE in these patients is increased about seven times, moreover, the presence of thromboembolism not only impairs the quality of life, but also worsens the survival prognosis.

The risk of VTE is derived from the histological type of tumor (often mucin-producing tumors), its stage, the presence of metastases and the therapeutic approach. During tumor mass disintegration after irradiation, chemotherapy or after surgery it is released large amount of tissue factor, which leads to chronic intravascular microthrombotization associated with microangiopathic hemolysis, to the development of disseminated intravascular coagulation in the perioperative period or to the increased risk of postoperative VTE. Cancer patients



have at least twice higher the risk of postoperative venous thrombosis and more than three times higher the risk of fatal pulmonary embolism compared with the patients without malignancy undergoing comparable procedure. Postoperative thrombophilia in these patients takes longer than usual 7–10 days. The risk of thromboembolism can also support the hereditary disposition to hypercoagulation, especially F V Leiden or FII G20210A mutations. The risk of VTE is about twice higher in cancer patients when they are carriers of F V Leiden.

Thromboembolic disease is a complication that can be prevented by adequate prophylaxis. Actually 4–44% of patients hospitalized for malignancy get pharmacological thromboembolism prophylaxis. Mostly low molecular weight heparin prophylaxis is indicated for immobile patients (>3 days confined to bed) with active cancer, family or personal history of VTE, or with other VTE risk comorbidities. Patients undergoing high risk cancer surgery (abdomen, pelvis) should receive extended prophylaxis up to 28 days.

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## HOW TO MONITOR NEW DIRECT ORAL ANTITHROMBOTICS WHEN NEEDED?

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New direct oral antithrombotics (NOACs) – direct inhibitor of thrombin (dabigatran) and direct inhibitors of F Xa (rivaroxaban, apixaban) – do not require routine monitoring of coagulation. However, the quantitative assessment of the drug exposure and the anticoagulant effect may be needed in emergency situations. Standard coagulation assays are variably affected by NOACs but cannot provide drug quantification and results are not equivalent to INR testing for warfarin.

The activated partial thromboplastin time (aPTT) may provide a qualitative assessment only of the presence of dabigatran. If the aPTT level at trough (i.e. 12–24 h after ingestion) still exceeds two times the upper limit of normal, this

may be associated with a higher risk of bleeding, and may warrant caution especially in patients with bleeding risk factors. Next routine test, the thrombin time (TT), is very sensitive to dabigatran levels and, thus, if the TT is normal, no significant effect of dabigatran exists. The prothrombin time (PT) may provide a qualitative assessment only of the presence of factor Xa inhibitor rivaroxaban. But, PT is not sensitive for the assessment of next F Xa inhibitor apixaban effect. Therefore, for both F Xa inhibitors is better to use the chromogenic assay of F Xa inhibition. But, laboratories should determine the sensitivity of their methods to the presence of NOAC.

At present, the quantitative tests for F Xa inhibitors and dabigatran with specific calibrators do exist (chromogenic assays and diluted thrombin-time, respectively). Their major problem is, that here are no data on a cut-off of these specific tests, below its, elective or urgent surgeries are “safe”. These tests do not account for the pharmacodynamics of the drugs and potential drugs interactions, too. Therefore, development and implementation in new quantitative laboratory assays will enable further dose optimization is needed.

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## PROPHYLAXIS OF VENOUS THROMBOEMBOLISM IN PREGNANCY – CURRENT VIEW

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Venous thromboembolism (VTE) is an infrequent, yet serious cause of both maternal and fetal morbidity and death during pregnancy and the puerperium. Women with a prior VTE, a family history of VTE, certain clinical risk factors and thrombophilia are at considerably increased risk for pregnancy-related. Heritable thrombophilias are also important co-determinants of VTE risk in pregnancy. The mechanisms

**Table 1. Effect of the NOACs on coagulation assays**

	dabigatran	rivaroxaban	apixaban
Significant anticoagulant effect unlikely	APTT and TT normal	PT normal	Normal PT (does not not exclude presence of therapeutic apixaban)
Anticoagulant effect present	TT prolonged, APTT prolonged	PT prolonged	PT prolonged or normal
Specific assays to quantify drug presence	Dilute thrombin clotting time (Hemoclot assay)	Modified Anti Xa assay specific for rivaroxaban	Modified Anti Xa assay specific for apixaban
APTT – activated partial thromboplastin time; TT – thrombin time; PT – prothrombin time			

through which pregnancy and hormonal therapies increase VTE risk have not been definitively established, but hormonal effects on levels of coagulation and anticoagulation factors likely play a role. Venous compression and injury also contribute to increased risk during pregnancy and the puerperium. Antithrombotic prophylaxis during pregnancy is mainly based on low-molecular-weight heparin (LMWH). They are safe and a single-day administration for VTE prophylaxis is effective. Actually, some agreement exists about LMWH treatment in “very high” and “high” thrombotic risk pregnant women. Only preliminary data are available about “moderate” and “low” thrombotic risk of pregnant women. Monitoring of the antiXa levels is indicated for use in pregnancy because evaluates efficacy and safety of doses of LMWH. Although prophylactic LMWH appear safe, there are important drawbacks to their use in pregnancy (inconvenience, discomfort of daily injections, risks of bleeding, skin reactions, and thrombocytopenia).

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## CHARACTERISTICS OF RESPONDERS TO CELLULAR THERAPY IN PATIENTS WITH CRITICAL LIMB ISCHEMIA

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**Background:** The aim of our study was to assess the effects of bone marrow cells (BMCs) application in patients (pts) with “no-option” critical limb ischemia (NO-CLI) and to address factors associated with the therapeutic benefit of cellular therapy.

**Methods:** Seventy patients (age 64±11 years, M:F 62:8) with advanced CLI (Rutherford category 5.6) not eligible for revascularization were randomized to treatment with 40 ml of bone marrow mononuclear cells (SmartPreP2 System) either using local intramuscular (n=36) or selective intra-arterial infusion (n=34). Pts with limb salvage were considered as responders to BMCs therapy. In the subgroup of 60 pts bone-marrow concentrate was analyzed for concentration of CD34+ cells and total nucleated cells. In the subgroup of 41 pts mesenchymal stem cells (MSCs) were isolated and characterized.

**Results:** The amputation free survival in overall group was 69% (48/70 pts) at 12 months. Eight pts died unrelated to stem cells therapy (11%), the limb salvage in survivals was 77% (48/62 pts). In responders, a significant improvement in transcutaneous oxygen pressure (tcpO<sub>2</sub>), pain scale, quality of life, wound healing, and Rutherford category of limb ischemia was noted at 6 months persisting up to 12 months. Responders (48 pts) were characterized by lower age (61±11 vs 67±10 years, p<0.05), lower baseline Rutherford category (5±0, vs 5.4±0.5, p<0.05), higher tcpO<sub>2</sub> (17±10 vs 6.2±6 mmHg, p<0.005), and lower pain intensity (scale 0–10) before procedure (4.3±2.3 vs 6.2±1.7, p<0.005), as compared with non-responders (14 pts). Importantly, baseline C-reactive protein levels were lower in responders as compared with non-responders (10±16 vs 68±91 mg/L, p<0.05). Responders were characterized by higher CD34+ cell counts (CD34+ 30±16×10<sup>6</sup> vs 21±13×10<sup>6</sup>, p<0.05) despite a similar number of total nucleated cells (4.4±1.4×10<sup>9</sup> vs 4.0±1.1×10<sup>9</sup>, p=0.15). The expression of cell markers CD44 and CD90 in MSCs from responders was significantly higher compared with non-responders (p<0.05). Additionally, patients with good response to cell application were treated by higher dose of atorvastatin during the follow-up period (21±17 vs 9±8 mg, p=0.001) compare with non-responders. There were no differences in IM versus IA application after 6 as well as 12 months in all observed parameters.

**Conclusion:** Bone marrow mononuclear cells delivery is effective method of therapy of patients with NO-CLI. Both IM and IA cells delivery are comparable methods of treatment. Lower age of patients, less advanced CLI, higher concentration of administrated CD34+ cells, but also of MSCs, and treatment with higher doses of atorvastatin are associated with better clinical outcome of cell therapy.

## TREATMENT OF SEEMINGLY UNTREATABLE PATIENT

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The primary goal of treatment in patients with critical limb ischemia is healing of the defect at the cost of only a temporary patency of intervened artery.

The authors describe a case report of a 86-year-old polymorbid patient in a social care home, yet independently mobile patient with a defect of the right lower leg and heel with a gradual progression over seven months to the area of the Achilles tendon. During this period the patient became step by step immobile. Present comorbidities: heart disease, diabetes, stroke in the past, hypertension, anemia normochromic normocyt first grade. The patient was treated by outpatient

surgeon for progression of defect and sent to hospitalization to Department of Surgery University Hospital Bratislava in April 2014. Color duplex ultrasound findings were realized with hemodynamically significant stenosis in femoral-popliteal segment. The patient was consulted by Department of Vascular Surgery and in May 2014 she was hospitalized there. Revascularization procedure of femoral-popliteal artery was performed in the form of angioplasty with stenting. In June 2014 revascularization procedures was accompanied by complete excision of tendinum Achillea cum necrectomy evacuation of the abscess. A gradual healing of the defect was lasting within months. Management of this patient required very close and permanent cooperation of specialists. Current color duplex ultrasound is without relevant restenoses, stent-flow is proper. Rehabilitation of patient continues with walking using G apparatus in December.

Successful revascularization is not the ultimate goal of therapy in these patients, but only part of the overall care. Achieving satisfactory healing of the lesion requires a multidisciplinary approach various specialists (interventional radiology and medicine, vascular surgeon, podiatrist, plastic surgeon, general practitioner, and physiotherapist). The key role plays family background and further care outside the health facility or social services homes. Such cooperation can also contribute to reduction of major amputations in Slovakia, where the incidence is still high.

## TEN YEARS EXPERIENCE IN RADICAL ENDOVENOUS LASER THERAPY OF LOWER EXTREMITY VARICOSE VEINS

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The paper is aimed to show our experience with endovenous surgical treatment of superficial venous insufficiency of the lower limbs.

**Subjects and methods:** We have been performing the radical endovenous laser therapy in the treatment of the chronic venous insufficiency of the great and the small saphenous veins with the device Cerelas D 15 (Biolitec Inc.) since 2004. The 980 nm wavelength was used until the end 2007, and the 1,470 nm wavelength has been used from 2008 to date. All patients underwent the procedure under the conditions of the aseptic operation theatre, the length of their hospitalization ranged from a few hours to 24 hours. In total, we treated 835 patients, 65.5% of them were females, the great saphenous veins were closed in 724 cases, the small saphenous veins in 103 cases, bilateral procedure was performed in 102 cases and the accessory veins in 77 cases. The power of the laser beam decreased from 12W in the groin to 2W in the ankle. The amount of energy released per unit length oscillated around 80 J/cm. We

always sought to treat simultaneously all varices on the extremities during the initial endolaser therapy. All dilated branches of the main veins were closed either by laser, or instrumentally with combined approach, or by sclerotisations.

**Results:** 448 (53.6%) patients were examined within 1 to 8 years after the procedure. The partial recanalizations in the main veins were observed in 7 (6.5%) patients, with the 980 nm device, and in 29 (8.5%) patients with 1,470 nm device, respectively. The complete recanalization in the main veins was observed in 3 (2.8%) patients with 980 nm device and in 8 (2.3%) patients with 1,470 nm device, respectively. All patients with total recanalization have been reoperated. The recurrence in the groin was found in 3 (2.8%) cases with 980 nm device and in 19 (5.5%) with 1,470 nm device, respectively. The recurrence in the popliteal area was found in 1 (0.9%) with 980 nm device and in 5 (1.46%) with 1,470 nm device, respectively. The immediate complications after the surgery were: longer lasting paresthesia in 12 (2.67%), skin burn of mild degree in 7 (1.56%), deep venous phlebotrombosis in 1 (22%) patient.

**Conclusions:** A vast majority of our patients was satisfied with the endolaser therapy provided for their varices. The benefit of radical treatment may be summarized as follows: better postoperative comfort and immediate cosmetic effect, significantly shorter work incapacity, faster achievement of full socio-economic activity. The administration of the cold physiological saline solution close to the laser fiber is a great advantage, in present time. We believe, that if we offer the radical treatment of lower extremity varices via endolaser therapy, the procedures should be performed in conditions of the aseptic operation theatre, with the choice of different types of anesthesia, crossectomy, instrumental removal of varices, in special cases.

We believe, that the more radical treatment is performed initially, the longer lasting effect may be expected, of course in synergy with the complete care of the insufficient venous system.



## DIFFERENCES IN ACUTE REJECTION BETWEEN CRYOPRESERVED AND COLD-STORED ARTERIAL ALLOGRAFTS IN RATS

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**Introduction:** Vascular prosthesis infection remains a serious problem in vascular surgery. Replacement of an infected prosthesis with a cold-stored or cryopreserved arterial allograft is a therapy of choice of this life-threatening condition. However, a late immune-mediated degeneration of arterial allografts with their rupture risk represents a limitation of this procedure. The influence of both types of conservation protocols on arterial antigenicity is still not clear.

**Aim of the study:** To compare the acute antibody- and cell-mediated rejection of both cryopreserved and cold-stored arterial allografts 30 days after their transplantation in rats.

**Material and Methods:** Infrarenal aortal grafts were obtained from male Brown-Norway rats (BN; RT1n) and divided into two groups according to the conservation protocol used. Half of grafts were stored for 180 days in the liquid nitrogen. Another half was stored for 24 hours in Custodiol solution at a temperature of 4 degrees Centigrade. Both of these protocols are routinely used in our clinical practice. All grafts were subsequently transplanted to the abdominal aorta of male Lewis rats (LEW; RT1l). No immunosuppressive or anticoagulation therapy was used. Histological and immunohistochemical evaluations of transplanted grafts were performed on day 30 posttransplant. Flow cytometry analysis of day 0 and day 30 sera obtained from Lewis recipients in both groups was performed to determinate the presence of antibodies against Brown-Norway MHC class I and MHC class II antigens.

**Results:** Both cryopreserved and cold-stored allografts induced strong donor-specific anti-MHC class I and anti-MHC class II antibody production on day 30. However, immunoglobulin G mediated destruction of *tunica media* was

observed only in cold-stored allografts. In addition, cold-stored arterial allografts showed extensive intimal hyperplasia and massive infiltration of *tunica adventitia* by MHC class II+, CD8+ and CD4+ cells of recipient origin. In contrast, only slight intimal hyperplasia, no destruction of *tunica media* and low immune cells infiltration of *tunica adventitia* were observed in cryopreserved aortal allografts 30 days posttransplant.

**Conclusion:** Cryopreserved aortal allografts showed markedly lower acute antibody- and cell-mediated rejection compared to cold-stored allografts in our experimental study.

## USEFULNESS OF VENA CAVA FILTERS FROM CLINICIANS VIEW

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There is a controversy regarding the appropriate indication for inferior vena cava filters (VCF) in treatment of venous thromboembolism. The presented overview is an attempt to support practical decisions with some existing data. Large literature on filters is available but only one study fulfils the parameters of prospective randomized comparative study – PREPIC-1. During 8 years of follow-up, in the group with VCF pulmonary embolism (PE) was less frequent than in the group without VCF, but for the price of more frequent deep vein thrombosis (DVT). Other observational studies using permanent filters like in PREPIC-1 showed similar results. Since last 10 years retrievable (temporary) filters are available giving the possibility to avoid late complications of VCF when the risk of PE is no more threatening. PREPIC-2 study using retrievable VCF was designed to elucidate whether the use of retrievable VCF will solve increase in recurrent DVT in the late phase (>6 months) after IVC insertion. Results are available as a conference abstract form only. As communicated, recurrence of DVT as well as recurrence of PE were less frequent in the group without than with inserted VCF. Evaluation of cases from RIETE registry did show only a trend which was in favor of VCF for the whole mortality. More prominent was the protective effect of VCF in hemodynamic unstable patients with PE (cardiogenic shock, massive embolism) either with or without thrombolytic therapy, as derived from NSI registry in USA. Meta-analysis of studies in patients with polytrauma showed a VCF protection when anticoagulation was contraindicated mainly. Data derived from literature are shortly discussed on background of existing guidelines. It seems, VCF filter on the top of the efficient anticoagulation therapy in PE is indicated mainly in hemodynamically unstable patients. Prophylactic IVC filter placement is an option in selected patients at high risk of thromboembolism for whom pharmacologic treatment is contraindicated or ineffective. For definitely conclusions is the available evidence still insufficient.



## BASIC PRINCIPLES OF THE SURGICAL TREATMENT OF SEVERE CHRONIC VENOUS INSUFFICIENCY

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Chronic venous insufficiency (CVI) is a medical condition including valvular incompetence with venous reflux, venous hypertension and failures of the microcirculation, as is typical of advanced varicose veins of the legs.

The aim of surgical treatment is not only to remove varicose veins, but also remove venous hypertension, or at least substantially reduced it. In practice this means to abolish all reflux points at sapheno-femoral junction (SFJ), sapheno-popliteal junction (SPJ) and all insufficient direct perforators. At the level of the superficial venous system remove entire insufficient venous system and insufficient perforators (stripping or ablation methods).

In the most of cases of primary varicose veins is present SFJ insufficiency, when is as a treatment usually indicated cross-section. Cross-section of the VSM with high ligation of the VSM is a fundamental and principal intervention used for SFJ insufficiency in severe varicose veins. It was the Trendelenburg, who in the year 1890 proposed ligation VSM in SFJ and therefore this intervention was named as Trendelenburg operation. This method has been modified by many different surgeons, but also has various deformations. Low ligatures of VSM without dissection and ligatures v. tributaries was often performed, leaving a stump of VSM, what was the cause of recurrent varicose veins.

The second serious indication for surgery and cross-section of SFJ are anomalies of SFJ. All v. tributaries to siphon of VSM can create various anomalies. These anomalies needs to be resolved after the ligation of VSM. These include abnormal orifice of VSM to *v. femoralis communis*: aneurysm, double junction of the SFJ, plexiform junction, H-shaped junction, anomalies of the orifice of *v. saphena accesoria* (VSA) and others.

A third indication for cross-section is ascension of thrombosis in VSM up to SFJ. The authors demonstrate their own rich clinical material and clinical experiences with surgery of SFJ and its anomalies.

Most radical intervention used when the superficial venous system is insufficient (VSM, VSP) is stripping. Stripping may be total, partial and invagination. Other varicose convolution can be removed by various techniques.

In the surgery of CVI have insufficient perforators (*vv. communicantes*) an important role. Perforators connect superficial and deep venous system and their insufficiency plays an important role in the development of CVI. Most commonly are affected Cockett perforators, less Boyd and Dodd perforators, when insufficient their reflux participate in the development of venous hypertension.

Perforator incompetence is defined as the return flow of venous blood lasting more than 0.3–0.5 seconds during the relaxation phase after the release of manual compression. Macroscopically is as insufficient considered perforator greater than 3 mm, which is also indication for perforator interruption. If the cause of perforator insufficiency is insufficiency of VSM or VSP and the width of the perforator is less than 3 mm is sufficient to operate on superficial venous system.

Indications for perforator interruption:

1. if the incompetence of deep venous system is associated with reflux without evidence of damage in superficial venous system;

2. while reflux is in both superficial and deep venous system perforator ligation and compressive therapy is recommended;

3. in isolated perforator insufficiency with evidence of CVI.

In general, the incidence of incompetent perforators is mainly in patients with severe CVI (clinical stage C4–C6 by CEAP classification) an indication for surgical treatment and perforator interruption. These perforators sometimes reach up to a width of 10–12 mm.

The authors demonstrate their own clinical results with perforator surgery for severe forms of CVI.

In vascular incompetence on level of deep venous system are indicated valvuloplasty and other various techniques.

## THE EFFECTIVENESS OF THE COMPRESSION THERAPY AFTER SCLEROTHERAPY OF THE VARICOSE VEINS

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**Introduction:** In the current guidelines on the treatment of varicose veins, compression is recommended as a routine measure following varicose vein intervention including the sclerotherapy.

**Aim:** the aim of the study is to determine the influence of the compression therapy to the risk of the formation of the sclerothromb (trapped blood) in the veins after sclerotherapy.

**Material and Methods:** 80 patients were applied short or longer regimen of compression (bandages – 4 patients and compression stockings – remaining 76 patients). The regimen was assigned to one individual patient according to randomized key. The formation of the trapped blood, risk of recanalization, type of sclerotherapy, the intervention accomplishment, the form of sclerosing substance (liquid or foam) and other parameters were noticed according to the study protocol.

**Results:** The statistic significant difference ( $p=0.001$ ) was found in both groups comparing the venous pain before and after sclerotherapy. The statistic significant difference ( $p=0.011$ ) was found in both groups comparing the fatigue before and after sclerotherapy. The types of vein not influence these results. No statistic significant difference ( $p=0.370$ ) was observed between both regimens using the  $X^2$  test at the risk

of forming sclerothromb. The statistic significant difference ( $p=0.014$ , using the  $X^2$  test) was found only in teleangiectasies, comparing both groups in parameter at the risk of sclerothromb forming. No statistic significant difference was observed between both regimens using the  $X^2$  test at the risk of recanalization.

**Conclusions:** The shorter regimen of compress therapy is sufficient after this intervention. The longer wearing of the compression does not influence the risk of forming a sclerothromb and decreased the risk of recanalization. Only in the case of teleangiectasies the longer regimen is recommended.

## LYMPHEDEMA AND LIPEDEMA IN ULTRASOUND IMAGING

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Ultrasound imaging is, after patient's history, inspection and palpation, together with lymphoscintigraphy the most common imaging technique for diagnosis of the degree and extent of lymphedema and lipedema. For the investigation we use B-mode sonography with 8–13 MHz linear probe. In transversal section, the thickness and structure of cutis and subcutis is described. The method enables at the same time the investigation of the superficial and deep vein system that is important in differential diagnosis. Characteristic signs for chronic lymphedema are thicker cutis, enlargement of subcutis with echolucent spaces with free fluid and fibrosis that all causes the non-compressibility of subcutaneous tissue. In lipedema the subcutis is enlarged as well, symmetrically on both sides, but the structure is fine with echogenic webs, and it is compressible.

Nevertheless, the ultrasound imaging of swollen leg doesn't answer the question of etiology. The image of echolucent spaces is found f.e. in congestive heart failure, renal or hepatic insufficiency. On the contrary, in latent or well treated lymphedema the image is negative (lymphoscintigraphy is positive). Apart from its low significance in differential diagnosis, ultrasound imaging is an important and objective parameter in individual monitoring of the clinical course.

## BEYOND THE ESC GUIDELINES 2012 ON CARDIOVASCULAR PREVENTION: CHOLESTEROL EVEN LOWER IS EVEN BETTER?

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Since the introduction in therapy of statins in 1987, many clinical studies have reported that these drugs reduce major cardiovascular events by reducing the low-density lipoprotein cholesterol (LDL-C) level, so inducing a revolution in the management of cardiovascular disease.

The Scandinavian Simvastatin Survival Study (4S) was the first large-scale study showing that the treatment with statins in secondary prevention reduced major cardiovascular events, cardiovascular mortality, and total mortality in patients with coronary artery disease and high blood cholesterol levels.

Then, the Cholesterol and Recurrent Events (CARE) trial, also demonstrated the cardio-protective effects of statins in patients with previous myocardial infarction and average cholesterol levels. After that, many trials were published about role of cholesterol lowering drugs in acute coronary syndrome (MIRACL, A to Z, PROVE IT, LIPID) and in chronic coronary artery disease too (HPS, IDEAL, REVERSAL, SAGE, TNT and others).

Approximately 25 years ago, the first Adult Treatment Panel (ATP) guidelines, according with first data in literature, set the stage for LDL-C as both a risk factor and a target of therapy.

Since then, ever-accumulating evidence on the role of LDL-C in atherosclerosis, coupled with the availability of more powerful statins and data that "lower is better" have led to what appears to be an inexorable march toward lower LDL-C goals, particularly for secondary prevention.

The ATP-III, in 2001, defined the optimal LDL level as <100 mg/dL and the next update in 2004, established a goal of <70 mg/dL as an option in very high-risk patients. Substantially the same happened for ESC guidelines on cardiovascular prevention in 2012.

In November 2013, the American College of Cardiology (ACC) and the American Heart Association (AHA) published a much-anticipated guideline update, in which the most surprising and controversial change was the abandonment of LDL-C targets and the suggested dose of drug useful to reduce levels of 50%. Instead, either moderate- or high-intensity statin therapy was recommended on the basis of underlying risk categories, irrespective of LDL-C response and the measurement of on-therapy LDL-C was recommended only for the purpose of assessing adherence.



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This ideological flip caused many editorial comments and new data appeared in literature about response to statin therapy. In particular, different meta-analysis demonstrated that high-intensity statin therapy doesn't always result in recommended LDL-C goal and in these cases it doesn't follow in better outcomes.

Recently, the results of IMPROVE-IT, presented at the AHA 2014 Scientific Session, reaffirmed the LDL hypothesis ("even lower is even better") demonstrated a further reduction of events with a new lower target of LDL-C of 53 mg%. Moreover, it was shown for the first time that "non-statin lowering LDL-C" reduces cardiovascular events too, so opening the way for new recommendation and maybe for future use of new cholesterol lowering therapies, like PCSK9 inhibitors, in this setting.

In conclusion the concept of "lower is better", that was abandoned for blood pressure and for glycemia in 2012 ESC Guidelines for CV Prevention, must be maintained for cholesterol and specifically LDL-C target must be a priority for patients in secondary prevention, according with all strongest data in literature demonstrating that "cholesterol even lower is even better".

## ENDOVASCULAR TREATMENT OF VERTEBRAL ARTERY STENOSIS

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**Aim:** Presentation of our experience in the endovascular treatment of vertebral artery stenosis.

**Materials:** In the years 2005–2014 in the Department of General and Thoracic Surgery (from 2014 the Department of General and Endocrinological Surgery) of Warsaw Medical University, 15 patients underwent vertebral artery stenting following percutaneous transluminal angioplasty.

**Methods:** Patients were examined before and after treatment. Each of them had a Duplex-Doppler and angio-CT scan of the vertebral arteries. Subjective assessments of the general condition and neurological status data were also noted. Follow-up included all of the patients and lasted from 6 to 117 months.

**Results:** Immediate good morphological and hemodynamic results were obtained in 15 (100%), clinical success was achieved in 14 (93.3%). During follow-up one patient had posterior circulation stroke and one died because of heart disease. 12 patients (80.0%) remained symptom-free at the last visit.

**Conclusions:** Endovascular stenting is safe and effective method for treatment of vertebral artery stenosis, with low complication rate and good long-term results. This method due to its characteristics and efficacy, according to us, is superior to best medical treatment.

## VENOUS THROMBOEMBOLISM WORSENS OVERALL SURVIVAL IN ADVANCED UROTHELIAL CANCER PATIENTS – A PROSPECTIVE STUDY

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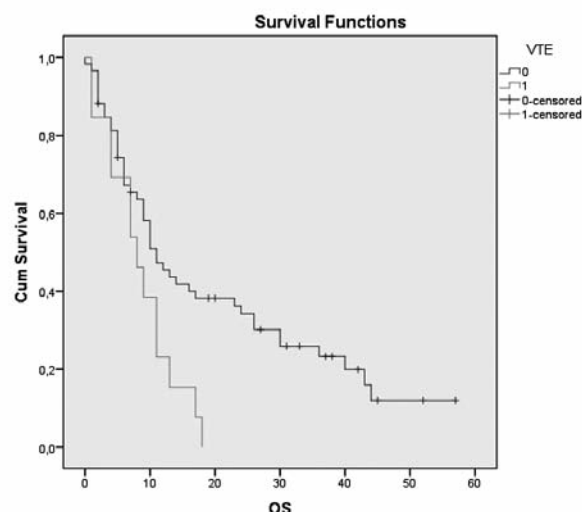
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**Background:** Cancer is established risk factor for development of venous thromboembolism (VTE). The absolute risk of VTE depends on the tumor type, the stage of disease, and treatment with neoplastic agents.

**Objective** of this study was to assess incidence of VTE events in patients (pts) with advanced urothelial cancers treated with cytostatics in the first-line setting, and to compare progression-free survival (PFS) and overall survival (OS) in the subgroups of pts without and with VTE event.

**Methods:** From May 2010 to September 2014, 72 pts (15 women, 20.8%) with advanced urothelial cancers (bladder 58 pts, renal pelvis 9 pts, ureter 3 pts, and *e loco ignoto* 2 pts) treated with first-line platinum-based combination chemotherapy were enrolled in this prospective study. Median age was 66 years (range 39–82), median number of metastatic sites was 2 (range 1–5), and median Karnofsky index was 80% (range 40–100%). Both, PFS and OS, were determined by log rank test (Mantel-Cox).

**Fig. 1. Overall survival in the group of pts without VTE event (upper line) vs the group of pts with VTE event (lower line)**



**Results:** In this study, totally 13 (18.1%) VTE events were established including 7 (53.9%) PE cases and 8 DVT cases (61.5%). Symptomatic VTE event was observed in 7 pts (53.9%). VTE was diagnosed by Doppler ultrasound and/or CT angiography. Median PFS was in the group without VTE event significantly better vs the group with VTE event [7.0 months (95% CI 4.6–9.4) vs 5.0 months (95% CI 3.9–6.1),  $p=0.046$ ]. Median OS (Fig. 1) was in the group without VTE event significantly longer vs the group with VTE event [11.0 months (95% CI 7.4–14.6) vs 8.0 months (95% CI 3.6–12.4),  $p=0.018$ ]. All patients were treated with low-molecular-weight heparins (LMWHs), median treatment was 6 months (range 1–16).

**Conclusions:** This prospective study confirmed relatively high incidence of VTE events in pts with advanced urothelial cancers treated with first-line combination chemotherapy that led to significant reduction of both, PFS and OS (in 2 months and 3 months, respectively).

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### ULTRASOUND-ACCELERATED THROMBOLYSIS FOR MASSIVE PULMONARY EMBOLISM

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A 41-year-old female presented to the regional hospital with increasing shortness of breath and cough. She was diagnosed with massive pulmonary embolism (PE) and had been primarily treated with systemic fibrinolysis (using r-tPA). Nevertheless, a repeat CTPA imaging showed persisting emboli in both right and left pulmonary arteries, as well as in segmental pulmonary arteries. Moreover, there was a new finding of a saddle thromboembolus at the bifurcation of the main pulmonary artery.

Because of failed systemic fibrinolysis the patient was referred to our medical care center. To provide more efficient dissolution of emboli we used the EKOS EndoWave Infusion Catheter System. This system enhances catheter directed thrombolysis by accelerating the fibrinolytic process via the application of ultrasound.

The EKOS-catheter was placed into the right pulmonary artery and the ultrasound accelerated thrombolysis was administered for a period of 18 hours with subsequent, almost complete dissolution of the right-sided emboli. Since the patient was still hypotensive and breathless on minimal exertion, with the evidence of persisted right ventricular pressure overload on repeat TTE, the catheter directed thrombolysis of the left-sided pulmonary artery was performed. After 24 hours of thrombolysis, the perfusion of the left lung was markedly improved and good clinical and hemodynamic outcomes were finally achieved.

The use of thrombolytic agents has become routine medical practice in the treatment of embolic and thrombotic vascular

occlusions. With the introduction of ultrasound accelerated thrombolysis we have obtained another important therapeutic tool for making patients survive high-risk massive PE.

### MYCOTIC ANEURYSM OF ASCENDING AORTA: A RARE CONDITION IMITATING RECURRENT INFECTIVE ENDOCARDITIS

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Infected aneurysm of ascending aorta is a rare but serious condition that is associated with significant morbidity and mortality. Treatment consists of antibiotic therapy combined with aggressive surgical treatment and vascular reconstruction, as needed. Endovascular therapies may have a role in the treatment of patients at high risk for open surgery. We describe a case of a 76-year-old polymorbid patient with recurrent *Pseudomonas aeruginosa* sepsis. First presentation was one year ago, with echocardiographic suspicion on infective endocarditis of aortic valve. Conservative treatment was indicated according to general condition of the patient and his wish, as well. Possible infectious focuses were treated and antibiotic therapy was continued for 2 months with no residual finding on control transesophageal echocardiography and positron emitted computed tomography (PET-CT). The patient was asymptomatic during next 3 months, but then the intermittent fever recurred and *Pseudomonas aeruginosa* sepsis was found again. The infective endocarditis or abscess of aortic valve were excluded, but the PET-CT showed a 35 mm large 18F-fluorodeoxyglucose positive aneurysm of ascending aorta – before the insertion of brachiocephalic trunc. The heart team indication was performed and high-risk surgical treatment was proposed. The patient declined any invasive procedure and was discharged with the medical treatment.

### IS ASPIRIN EFFECTIVE IN MANAGEMENT OF PATIENTS WITH PERIPHERAL ARTERIAL OCCLUSIVE DISEASE?

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The efficacy of aspirin depends on the clinical characteristics of treated population and probably also on the type or location of atherosclerotic disease. It seems that it is most effective in coronary patients with clinically unstable disease, less effective in prevention of cerebrovascular incidents and its efficacy is uncertain in peripheral artery disease (PAD) patients. One of the first meta-analysis (Antithrombotic Trialists' Col-



laboration – ATC) indicated that antiplatelet drugs significantly reduce cardiovascular events in patients with PAD. However, only one third of the PAD patients included were treated with aspirin, while the rest received other anti-platelet drugs. The latest ATC meta-analysis of randomized control trial of aspirin therapy involving patients with diabetes and PAD demonstrated no benefit of aspirin in reducing cardiovascular events. Also in patients with preclinical PAD (pathological ABI) aspirin did not result in a significant reduction of vascular events.

The new anti-platelet drugs prasugrel, ticagrelol, picotamide seem to be more effective than aspirin in PAD patients, particularly in diabetic patients with PAD.

## REGULATION AND REIMBURSEMENT OF THE CRITICAL LIMB ISCHEMIA STEM CELL THERAPY

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Critical limb ischemia (CLI) is a complicated health care problem marked by high rates of morbidity, mortality and resource utilization. The annual incidence is roughly 500–1,000 new cases per million in industrialized countries, and disease prevalence is expected to rise with increasing rates of diabetes and the aging of the population. CLI is a progressive disease without any cure. Over time arterial flow to the patient's lower extremity becomes increasingly compromised, putting them at risk for infection, amputation and death. While treatment has been directed at restoring arterial blood flow by either surgical by-pass or endovascular procedures, an estimated 25–40% of patients may not be suitable for arterial reconstruction and still others may fail reconstructive therapy. This subgroup of patients without revascularization options ("no option" CLI or NO-CLI) is a particularly challenging population with high rates of limb loss and death, and novel therapies are an active area of investigation.

Bone marrow derived stem and progenitor cells have been identified as a potential new therapeutic option to induce angiogenesis. The aim of therapeutic arteriogenesis in ischemia is the induction and augmentation of collateral artery growth which is the most important physiologic repair mechanism in PAD. The proliferation of the collateral endothelium is initiated by the up-regulation of adhesion molecules, release of cytokines leading to the attraction and perivascular immigration of bone-marrow derived monocytes. Monocytic cells of bone marrow origin secrete growth factors, induce matrix proteases and later, vessel stabilizing factors. With enough arteriogenetically active bone marrow cells in the perivascular space, the maturation of a collateral artery network needs ~6–8 weeks. With the direct transplantation of a concentrate of nucleated bone marrow cells, BMAC method closely mimics the physiological repair mechanisms in ischemia.

Big systematic review was done by Eric Benoit et al. in *Cell Transplantation*, vol. 22, 2013. In the seven RCTs patients receiving cell therapy had a significantly lower amputation rate than control patients (14.4% vs. 27.6%,  $p=0.0019$ ). Meta-analysis of amputation rates in the seven RCTs demonstrated a beneficial treatment effect with an odds ratio of 0.36, indicating that patients receiving cell therapy had a 36% chance of amputation compared to control patients.

CLI patients of Rutherford class 5 are suitable candidates for BMCs transplantation and can have a good result of treatment. The efficacy of BMCs therapy in patients with Rutherford class 4 needs further confirmation, thus more well designed, randomized, double-blind, controlled trials and the endpoints recorded by Rutherford class are needed to confirm the efficacy and safety of BMCs therapy. Again, no correlation study between the three routes of administration (intravenous, intramuscular, intraarterial) has been performed, although the present trend points towards intramuscular administration. It has been reported that the combination of both routes (intramuscular plus intraarterial) has resulted in substantial improvements in clinical outcomes, but this must be confirmed in new clinical trials.

We are very close to using stem cell therapy for no-option CLI patients from couple of reasons:

### SAFETY

- Completely autologous system
- Designed to be used point-of-care reducing contamination risks
- High degree of sterility

### SIMPLICITY

- Point-of-care processing
- Easily transportable
- Does not require dedicated trained personnel

### EFFICIENCY

- High degree of process efficiency allows the system to concentrate a clinically viable number of cells
- Titrate final volume as desired

### RAPIDITY

- Process time for biologic concentrates is less than 15 minutes
- Can be used intraoperatively (point-of-care setting)

## NURSING INTERVENTIONS FOR PATIENTS WITH STENOSIS OF THE AV FISTULA

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Hemodialysis is an extracorporeal blood purification performed by the specialized device. For this type of treatment it is necessary to surgically create a vascular access i.e. arterio-

venous fistula. AV fistula is an arterio-venous shunt in which two needles are installed. The blood is delivered into the dialysis device through one needle and then returned into patient's blood circulation through the second needle. Vascular access is a crucial prerequisite for an adequate blood flow. If this approach fails and vascular access becomes dysfunctional, one option to reopen the AV fistula is to perform angioplasty or stenting. It is an invasive technique allowing dilation of short stenoses and has a dominant position in the treatment of stenoses of AVF with the success percentage of 60–90%. One of the advantages of this technique is that it can be repeated several times and it takes from 30 to 120 minutes. Resultant stenosis less than 30% is considered to be a favorable outcome of the procedure. If it fails reparation AVF, may temporarily transfer the insertion of a central venous catheter in the internal jugular vein, this PermCath can be used for a period of six to twelve month. The advantage of Angiology department is that correct location of perm cath tip in the right atrium can be checked by the X-ray. Early recanalization of the vascular access for hemodialysis improves the patient's quality of life and renal parameters.

The aim of this work is to provide nurses with information about methods in opening the AV fistula closure and methods of introducing PermCath. It provides information about interventional procedure at the angiology operating room, but also about the nursing interventions before, during and after the procedure.

## AN OVERVIEW OF CONSERVATIVE TREATMENT OF LYMPHOSTATIC EDEMAS EMPHASIZING MANUAL LYMPHDRAINAGE AND ITS MODIFICATIONS

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According to conservative estimates, about three million people in Germany suffer more or less from some disease of the lymphatic system like primary, secondary, lip- and phlebedemas. Most patients have learnt details about the disease and the appropriate modes of treatment inadvertently from therapists or self-help groups.

Throughout the entire course of medical studies, little attention is devoted to the diseases of the lymphatic system, and consequently students and doctors in Germany have little acquaintance with the problems of lymphedema. Because of the increasing numbers of surgical operations, the incidence of lymphedema has certainly increased, but improvements in treatment and refined therapeutic techniques have done much to lessen the burden of the disease.

Depending on its severity, edema is subdivided into different stages:

Lymphedema in Stage 0

Lymphedema in Stage 1

Lymphedema in Stage 2

Lymphedema in Stage 3

### Phases of therapy

The intensive therapy consists of two-phase treatment as devised by Földi and completed by Lympho-Opt.

#### Phase I (decongestion phase)

- Hygiene/skin treatment
- Manual whole-body lymphatic drainage (5 times per week)
- Compression therapy with bandages
- Special gymnastic exercises
- Diet
- Motivation

#### Phase II (maintenance phase)

- Hygiene/skin treatment
- Manual whole-body lymphatic drainage (once to twice a week)
- Compression therapy with compression stockings
- Special gymnastic exercises
- Diet
- Motivation

### Inpatient therapy

- Treatment as an inpatient in hospital is necessary in cases of primary and secondary lymphedema in late stages II and III
- Cases of lymphedema with complications (erysipelas, other concurrent diseases, cancer recurrences)
- Cases of lymphedema with lymph fistulae, lymph cysts or lymphoceles
- Lymphedema of the face or lymphedema of the genitals
- Lymphedema of internal organs
- Children up to 8–10 years of age, accompanied by a person with parental rights
- Cases of post-traumatic lymphedema and lymphedema associated with Sudeck's bone atrophy

In our clinic inpatient treatment comprises daily manual whole-body lymphatic drainage, intermittent pneumopressotherapy with Lympho-Press devices, pulsed magnetic field therapy (we saw a better outflow of liquid while using the field), followed by compression bandaging. In the afternoon we apply the central lymphatic drainage and gymnastics.

Cross walking (with walking sticks, called Lympho-Opt walking, special exercises) and if necessary aftercare and treatment for any concomitant diseases.

Furthermore, patients are put on a reduction diet, because any overweight will have adverse effects on lymphedema.

In the event of pain, patients also receive soft laser irradiation, which is also employed to loosen or soften scars and for ulcers of the legs, together with appropriate foot baths and ulcer treatment with O<sub>3</sub> gas and later on CO<sub>2</sub> – gas for better oxygenisation.

Inpatient treatment also comprises decongestion exercises, therapeutic dancing like Zumba and relaxation exercises and Qigong. When there is fibrosis we treat the patients with sound

waves and we treat in an electrostatic field. In addition patients are given comprehensive information regarding psychiatric relief, correct nutrition and the entire complex of lymphatic diseases.

#### Summary of clinical treatment in the Lympho-Opt

- Manual whole-body lymphatic drainage
- Lympho-Press and Lympho-Wave
- Flowave
- Hivamat
- Soft laser radiation
- Pulsed magnetic field
- Infrared cabin
- O<sub>3</sub>
- CO<sub>2</sub>
- Compression bandages
- Active exercises, therapeutic dancing, Qigong
- Cross-country walks
- Psychotherapy
- Reducing diet

To improve their compliance, patients in our hospital are served with a breakfast buffet, and two meals, at midday and in the evening, with a choice from an external menu service in cook and chill style.

#### IS VENOUS HYPERTENSION REALLY SO IMPORTANT?

Spáčil J.

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**Aim:** Venous hypertension has been considered as the main cause of chronic venous insufficiency. However, venous pressure in lower limbs while standing and sitting remains higher most of the day compared to ambulatory venous hypertension. Venous pressure is influenced by body height. So we calculated 24-hour venous pressure and studied an effect of body height on the severity of chronic venous disease.

**Methods:** Published values of venous pressure in the lower limb in healthy persons and in patients with varicose veins, and reported times of walking and sitting were used to calculate venous pressure for 24 hours. We also examined 1,026 lower extremities in 124 men and 392 women. Their clinical condition was evaluated using CEAP classification. Duplex sonography was used to exclude deep venous occlusion and to evaluate venous reflux. Photoplethysmography was used to assess venous functions.

**Results:** Calculated mean venous pressure for 24 hours reached 49.3 mmHg in healthy persons, 50.6 and 52 mmHg in patient with varicose vein (C2, C3 resp. C4).

In our patients we confirmed the known relationship between age and weight and severity of clinical condition and presence of reflux. We did not demonstrate a statistically significant relationship between body height and clinical

condition, presence of venous reflux and venous refilling time after exercise.

**Conclusion:** 24-hour venous pressure in healthy subjects and in patients with varicose veins in lower limb show only very small difference. We did not demonstrate an effect of body height on the severity of chronic venous disease. The importance of venous hypertension, particularly in initial stages of the disease, should be revised.

#### UNCLEAR CAUSE OF ACUTE LIMB ISCHEMIA IN A YOUNG DIABETIC WOMAN

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We describe a case report of an 18-year-old woman. She suffered from diabetes mellitus type 1 since her 14 years and she took hormonal contraceptives. Otherwise, her familial and past history was negative. Ten days before hospitalization a rest pain in the whole left leg occurred suddenly. On admission only the femoral pulse was present in the left limb. At duplex ultrasonography, angio-CT and angio-MRI an occlusion of the superficial femoral artery from the origin was found out. This was confirmed using angiography, where only a short stump of the superficial femoral artery (SFA) with collateral filling of the SFA in Hunter's canal occurred. Popliteal artery, three crural and two pedal arteries were patent. Mechanical thrombectomy of the SFA using 6F Rotarex was performed from the contralateral approach.

After one passage of the catheter the patency of the SFA was restored, but the wall irregularities of the proximal segment of SFA an embolic occlusion of the distal popliteal artery and of the origin of crural arteries appeared. Percutaneous aspiration and new passage of the Rotarex catheter were not successful. Therefore local thrombolysis was administered which achieved a complete patency in 24 hours. Self-expandable stent 6x60 mm was implanted in the proximal segment of the SFA.

Only little relief of symptoms was obvious after this procedure – claudication in the left calf lasted after 200 meters. Thrombophilia and vasculitis were also excluded. Due to a progression of claudication a new angiography was performed – patent SFA with severe in-stent restenosis was found. This restenosis was treated using drug-eluting balloon, during the procedure severe vasospasm of the SFA occurred which had to be managed pharmacologically. Therefore a radiofrequency sympathectomy was carried out. After this procedure claudication disappeared, only atypical pain in the leg emerges occasionally.

The reason for acute limb ischemia remains unclear in this patient. Only a great tendency toward vasospasm was evident.

## HOW WE TREAT DEEP VEIN THROMBOSIS (DVT) AND PREVENT DVT RECURRENCE AND POSTTHROMBOTIC SYNDROME IN 2015

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Duplex ultrasonography (DUS) does pick up alternative diagnoses (AD) including Baker's cyst, muscle hematomas, old deep vein thrombosis (DVT), and superficial vein thrombosis. The sequential use of DUS followed by a sensitive D-dimer test and a clinical score assessment is a safe and effective non-invasive strategy to exclude and diagnose DVT and AD in patients with suspected DVT. Acute DVT patients are recommended to wear medical elastic stockings (MECS) for symptomatic relief of swollen legs during the acute phase of DVT, or when postthrombotic syndrome (PTS) is present. Discontinuation of anticoagulation at 6 months post-DVT is followed by a subsequent 20–30% DVT recurrence rate as the main cause of PTS. To bridge the gap between DVT and PTS, the frequent occurrence of PTS is best prevented by extended anticoagulation based on objective risk factors for DVT recurrence. Post-DVT rapid and complete recanalization without reflux on DUS within 1–3 months occurs in about one third of DVT patients is associated with no PTS and low risk on DVT recurrence and PTS, obviating the need of MECS and anticoagulation at 3 to 6 months post-DVT (1.2% of 100 patient/years). The presence of residual vein thrombosis (RVT) and reflux due to valve destruction, irrespective of the degree of recanalization on DUS at 3 to 6 months post-DVT, is associated with a high risk of DVT recurrence and PTS in about one third of post-DVT patients, indicating the need to extend anticoagulation with novel oral anticoagulants and to wear medical elastic stocking for symptomatic relief of PTS. Isolated acute ileo-femoral DVT and extension of proximal popliteal/femoral DVT into the ileo-femoral region are at high risk of DVT recurrence and PTS and therefore candidate for the randomized clinical trial comparing Catheter Accelerated thrombolysis Versus Anticoagulation (CAVA). We designed a prospective safety outcome management study to bridge the gap between DVT and PTS in patients with distal, proximal and ileo-femoral thrombosis, with the aim of reducing the overall DVT recurrence rate to, 3% patient/years during long-term follow-up.

## CAROTID ARTERY PLAQUE MODIFICATION DURING CAROTID STENTING ASSESSED BY NEAR-INFRARED SPECTROSCOPY AND INTRAVASCULAR ULTRASOUND

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**Aims:** A prospective single centre study of near-infrared spectroscopy (NIRS) combined with intravascular ultrasound (IVUS) during carotid artery stenting (CAS). The primary objective was to evaluate safety and feasibility of NIRS-IVUS imaging of carotid arteries and to describe size and distribution of lipid core plaques (LCP) before and after CAS. The following parameters were used to quantify size and localization of LCP: lipid core burden index (LCBI), maximal lipid core burden index in any 4 mm segment of the artery (LCBI<sub>max</sub>) and lipid core burden index in 4 mm segment at minimal luminal area (LCBI<sub>mla</sub>).

**Methods and Results:** A total of 32 patients at high risk for surgical endarterectomy (62% male, mean age 64.3±6.7 years) were enrolled. Three NIRS-IVUS pullbacks were performed: before and after stent implantation and after postdilatation. High quality NIRS data were obtained in all cases (100%). There were no periprocedural complications related to NIRS-IVUS imaging and no periprocedural stroke or death. Mean LCBI decreased from 107.4±95.4 before CAS to 44.2±59.2 after stent implantation ( $p<0.001$ ) and 29.4±38.8 after postdilatation ( $p=0.075$ ). Mean LCBI<sub>max</sub> decreased from 352.7±208.5 before CAS to 175.7±166.8 after stent implantation ( $p<0.001$ ) and 156.2±153.8 after postdilatation ( $p=0.215$ ). Mean LCBI<sub>mla</sub> decreased from 206.1±224.5 before CAS to 52.1±123.1 after stent implantation ( $p<0.001$ ) and 26.1±65.6 after postdilatation ( $p=0.098$ ). Lipid rich plaques were significantly more frequent elsewhere than at minimal luminal area (LCBI<sub>max</sub> before CAS 352.7±208.5 vs. LCBI<sub>mla</sub> before CAS 206.1±224.5;  $p<0.001$ ). LCBI ( $r=-0.24$ ;  $p=0.177$ ) and LCBI<sub>mla</sub> ( $r=-0.05$ ;  $p=0.782$ ) did not correlate with MLA.

**Conclusion:** Our results suggest that performing of NIRS-IVUS during CAS is safe and feasible and provide additional information about atherosclerotic plaques in carotid arteries. We observed significant reduction of NIRS-derived lipid core size parameters during CAS.



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## ENDOVASCULAR TREATMENT OF ANEURYSMS LOCATED AT THE ORIGIN OF DUCTUS BOTALLI IN ADULT PATIENTS

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**Introduction:** *Ductus arteriosus Botalli* (DA) allows most of the blood in fetal pulmonary artery to by-pass pulmonary circulation directly to the distal part of aortic arch. Early after birth it spontaneously occludes and during three months becomes the fibrous ligamentum arteriosum. Persisting DA is usually diagnosed in early childhood and it is usually corrected by interventional cardiologist or cardiac surgeon. The location of the DA origin on the aortic arch is a locus minoris resistentiae due to abnormal intraductal tissue. Saccular or conical pseudoaneurysms can originate on this spot during adulthood.

**Methods:** During 2008–2014 we diagnosed and treated symptomatic and asymptomatic aneurysms in a typical location at distal part of the aortic arch in 10 patients. They were 6 men and 4 women aged 66–87 (median 79 years). Hoarseness was the major sign in five persons due to laryngeal nerve compression (Ortner sy.), four aneurysms were asymptomatic. One patient had acute hemorrhage from symptomatic aneurysm. In six patients we treated endovascularly with stent graft (SG), in four we did hybrid intervention. Left subclavian artery was

revascularized simultaneously with SG in one patient or early after endovascular intervention in two patients. Branched aorto-anonymal-and-subclavial by-pass was performed before endovascular treatment in one patient.

**Results:** The pseudoaneurysm was successfully covered with subsequent thrombosis in 9 patients. Perioperatively, one patient had type I endoleak, she suffered transitory ischemic attack and respiratory failure with the necessity of prolonged artificial ventilation and she died on the 31<sup>st</sup> day after intervention. An average length of stay in survivors was 13 days. An average follow up is 18 months (5–29).

**Conclusion:** The location of the DA origin on the aortic arch in adults is a weakened spot where rarely pseudoaneurysms may originate. Endovascular treatment with SG represents a less invasive alternative to open surgery in selected patients.

## DYNAMIC <sup>31</sup>P MR SPECTROSCOPY IN PATIENTS WITH PERIPHERAL ARTERIAL OCCLUSIVE DISEASE

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Dynamic phosphorous (<sup>31</sup>P) MR spectroscopy allows non-invasive study of the differences in an energetic metabolism between patients with Peripheral Arterial Occlusive Disease (PAOD) and healthy subjects.

The aims of the study were: 1) to determine how ischemia influences muscle metabolisms in PAOD patients; 2) to find out the potential of the method in clinical routine to assess the severity of ischemia in individual patients.

We examined 25 patients (70±7 years, BMI=27±4 kg/m<sup>2</sup>, 18 males and 7 females) with PAOD and 21 healthy controls (41±12 years, BMI=28±2 kg/m<sup>2</sup>, 12 males and 9 females). Dynamic <sup>31</sup>P MR spectroscopy was performed on a whole-body 3T MR system with dual <sup>1</sup>H/<sup>31</sup>P surface coil and home-made pedal ergometer. The subjects were examined in a supine position with the coil fixed to the medial head of the gastrocnemius muscle. The dynamic examination consisted of 2 min rest period followed by 6 min exercise (plantar flexion once every 2 s; 7 kg weights) and final 6 min of recovery. Signal intensity ratios of phosphocreatine (PCr), inorganic phosphate (Pi) and phosphodiester (PDE) to ATP and intramyocellular pH were calculated from the rest spectrum together with drop of PCr, pH, rate of PCr recovery and mitochondrial capacity from the dynamic part of the examination.

We found significantly reduced mitochondrial capacity, very prolonged rate of phosphocreatine recovery and lower pH in the end of exercise in patients compared with healthy subjects.



Fig. 1. "Triple star" sign, an aneurysm at the aortic arch anterior wall

These results show negative influence of PAOD on oxidative muscle metabolism. Smaller rate of oxidative metabolism caused predominance of anaerobic metabolism and drop of pH. Big drop of pH and prolonged rate of PCr recovery explains the subjective discomfort (e.g. claudications and fatigue) in PAOD patients.

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## **SUPERFICIAL VENOUS THROMBOSIS – MYTHS AND REALITY**

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Superficial venous thrombosis (SVT) is etiologically a heterogeneous group of disorders with a different degree of inflammation and thrombosis. SVT has long been considered as a benign and limited disease or sign of chronic venous insufficiency, to be managed with local and/or systemic anti-inflammatory drugs in combination with elastic stockings. In many cases SVT is a banal condition which resolves spontaneously, but in recent years due to systematic ultrasound investigation of the venous system a large number of deep venous thromboses concomitant with SVT has been revealed. Several studies have confirmed an association between SVT and venous thromboembolism (VTE). SVT located in the saphenous main trunk seems to have the strongest association with VTE. Some physicians consider SVT an integral part of VTE, together with deep venous thrombosis and pulmonary embolism.

The clinical diagnosis of SVT is easy as symptoms and signs are overt. But for precise evaluation of the SVT extension compression duplex ultrasound (DUS) investigation is needed. Clinical investigation may the real extent of superficial thrombophlebitis underestimate, and does not give enough information on the status of the deep venous system. DUS allows evaluate the extension of the thrombus into the deep venous system through perforating veins or through sapheno-femoral and/or sapheno-popliteal junctions.

The aim of the treatment is to stop the extension of SVT in the superficial vein, to reduce the inflammation of the vein and perivenous tissues as well as to prevent the extension of the thrombus formation into the deep and the communicating venous system. The main therapeutic procedure is compression and mobilization. In patients with a limited SVT in a varicose vein (varicophlebitis) local treatment and mobilization with elastic compression will be sufficient. In contrast to SVT of a healthy vein varicophlebitis is a banal condition in majority of cases. Non-steroidal anti-inflammatory drugs may be given, either systematically or locally. Especially in cases of extensive SVT anticoagulant therapy is a good choice. According the CEVF Consensus Proposal (2011) and Consensus

Statement under the auspices of IUA, IUP, CEVF and Vascu-lab (2012) patients with SVT, with an inflamed and thrombosed superficial vein longer than 5 cm on duplex ultra-sound investigation should have anticoagulant treatment with LMWH at intermediate or therapeutic dose for 4 weeks. The dosage and duration of anticoagulation depends on concomitant diseases and other risk factors. In patients with extended SVT (more than 10 cm) with additional risk factors for VTE s.c. fondaparinux in prophylactic dose should be considered for 6 weeks.

## INVESTIGATION FOR CANCER AFTER VENOUS THROMBOEMBOLISM

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Venous thromboembolism (VTE) is a relatively common disease especially in elderly people and in high risk patients such as those with cancer, immobilized due to injury or surgery or in carriers of thrombophilic gene mutations.

VTE occurs in 4 to 20% of patients with cancer.

Investigation for cancer is usually recommended in most patients after VTE. But what is the “right investigation for cancer” in patients after VTE?

Generally, investigation should be beneficial as much as possible for the patient’s health as well as cost beneficial.

There are three main sources of information in searching for the list of investigations and tests:

1. Very careful personal and family history evaluation and physical examination of the patient – checking general signs of health and disease or anything else that seems unusual, patient’s health habits and past illnesses and treatments.

2. Age of the patient and incidence of cancer in the population – which types of cancer are the most probable in his/her age?

3. Age of the patient and national cancer screening investigations – did the patient undergo all screening tests recommended in his/her age? – breast cancer, colorectal cancer, cervical cancer.

The authors suggest the way how to create a list of suitable investigations and tests for cancer in patients after VTE, beneficial for the patient’s health as well as cost beneficial.

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## PREDICTION OF DIALYSIS GRAFTS LONG-TERM PATENCY

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**Background:** Dysfunction and loss of patency of dialysis arteriovenous grafts (AVG) are a serious cause of dialyzed patients morbidity. Various risk factors associated with shorter AVG patency have been suspected by some authors, but the results were controversial. The aim of this study was to assess if affiliated diseases, biochemical markers and other parameters of arteriovenous grafts (AVGs) influence their patency in a large Vascular Access Centre.

**Methods:** We conducted a retrospective study that included patients, who underwent creation of AVG in our institution and that were patent for at least 3 weeks after AVG creation. We included the following variables into the analysis: comorbidities (ischemic heart disease, diabetes mellitus, chronic heart failure, arterial hypertension, hyperlipidemia), smoking status, drug use (beta blockers, ACE inhibitors, statins), basic laboratory values (platelet count, hemoglobin level, fibrinogen, cholesterol and triglycerides) and graft characteristics (feeding artery, shape of the graft). The data was assessed using log-rank (Cox-Mantel) test. The differences were shown using Kaplan-Meier graphs. The data was assessed for 1,000 days of observation.

**Results:** Overall 338 patients were included in the study. For the observation period, significantly higher risk of access failure was associated with presence of ischemic heart disease ( $p=0.0035$ ). Higher levels of blood cholesterol levels were associated with longer survival of the graft in 1,000 days surveillance ( $p=0.04$ ). Lower fibrinogen blood levels showed association with shorter survival with borderline significance ( $p=0.0516$ ).

**Conclusions:** Ischemic heart disease negatively influences the cumulative patency of vascular access. Higher cholesterol blood levels are associated with lower AVG failure risk in 1,000 days period, which probably corresponds to the worse disease status of the lower cholesterol patients.

## IMPACT OF COEXISTING MULTIVESSEL CORONARY DISEASE ON SHORT-TERM OUTCOMES AND LONG-TERM SURVIVAL OF PATIENTS TREATED WITH CAROTID STENTING

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**Background:** Systemic atherosclerosis can result in both coronary artery disease (CAD) and carotid artery disease. Recently it has been shown that patients with CAD have a higher occurrence of microembolizations during carotid stenting (CAS) and it has been hypothesized that they could be at higher risk in this intervention.

**Methods:** We retrospectively evaluated an institutional registry with 437 consecutive patients who underwent coronary angiography and CAS to evaluate their short-term outcomes and long-term survival with regard to the presence of coexisting multivessel coronary artery disease (MVD).

**Results:** We performed 220 CAS procedures in MVD patients and 318 CAS procedures in non-MVD patients. The occurrence of in-hospital CAS-related adverse events was 2.7% and 2.5% in the MVD and non-MVD groups, respectively ( $p=0.88$ ). At 30 days, there was no significant difference between the groups in terms of the number of patients with adverse events (hierarchically death/stroke/myocardial infarction; 8.8% vs. 5.5%;  $p=0.18$ ). The median duration of follow-up was 4.23 years. Survival free of all-cause mortality at one, three and five years was 90% (95% CI, 86–94%), 79% (95% CI, 73–85%) and 70% (95% CI, 64–77%), and 92% (95% CI, 89–95%), 85% (95% CI 80–90%) and 76% (95% CI, 70–82%) for the MVD and non-MVD groups ( $p=0.02$ ), respectively.

**Conclusions:** These results suggest that patients with MVD combined with carotid artery disease are probably not at higher risk of early post-CAS adverse clinical events, but they have significantly worse long-term survival rates.

## CAROTID ENDARTERECTOMY (CEA) FROM THE SURGICAL POINT OF VIEW

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**Introduction:** Carotid endarterectomy (CEA) is one of the most common vascular procedures in the world. In addition to the vascular surgeon, neurologist and neurosonologist should be involved in the management of the carotid disease treatment. The present role of CAS in carotid stenosis treatment is still to be demonstrated and more evidence is required.

**Methods:** The guidelines, role of both treatment modalities (CEA and CAS) for symptomatic and asymptomatic lesions, as well as different types of CEA (traditional, eversion), types of anesthesia and typical postoperative complications are discussed. In last 2 years, results of large randomised trials were published, and this results may influence the future treatment management of patients with carotid lesions.

**Conclusion:** Contemporary carotid intervention has a low risk of serious morbidity and mortality. In agreement with present guidelines, CEA is now the standard revascularization therapy and the treatment of choice. Vascular surgeon should

compare personal results a experience with new trials result, and consider their contribution to the patients.

## LASER TREATMENT OF THE ANTERIOR ACCESSORY GREAT SAPHENOUS VEIN (AAGSV) – ABOLITION OF THE REFLUX WITH PRESERVATION OF THE GREAT SAPHENOUS VEIN (GSV)

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**Introduction:** Many surgeons still strip or ablate the great saphenous vein (GSV) during surgery for sapheno-femoral junction (SFJ) and anterior accessory great saphenous vein (AAGSV) reflux. This small study assesses the short-term efficacy and results of endovenous laser ablation (EVLA) of the AAGSV with preservation of a competent GSV in the treatment of varicose veins occurring due to isolated AAGSV incompetence.

**Methods:** Twenty eight patients undergone EVLA of AAGSV (group A) and same size group undergone traditional varicose vein surgery (group B) for the same type of disease – SFJ and AAGSV insufficiency. We compared with ultrasound the status of competency of SFJ, anatomical success of AAGSV ablation/stripping (abolition of reflux on duplex ultrasound) and VCSS (Venous Clinical Severity Score).

**Results:** In both groups, the reflux in AAGSV was successfully treated in twenty six (group A) and twenty seven (group B) patients, respectively. No difference in VCSS was found in both groups after twelve months.

**Conclusion:** EVLA of refluxing AAGSV is as effective method as traditional surgery. The method is safe and effective, and represents suitable solution for patients seeking for alternative and miniinvasive approach.

## AUTOLOGOUS STEM CELLS IN THE THERAPEUTIC MANAGEMENT OF AN EXTENSIVE PRESSURE ULCER AFFECTING OCCIPITAL AND PARIETAL BONE

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A female patient 81-year-old, in good health condition, living on her own in a house suffered a stroke in 2001, and in 2010 she was diagnosed with an inoperable brain tumor. Apart from occasional memory loss and short term nausea she had no difficulties and could take care of herself. Following a visit she paid to her relatives in December 2013 she suddenly lost consciousness, fell and was left lying on a stone floor until her



relatives found her after two days. She developed an extensive pressure ulcer in the location between her shoulder blades and the occipital and parietal bone in the skull, accompanied by loss of hair, skin, and subcutaneous tissue up to the bone in the area of 10x12 cm. After two months of hospitalization at the Department of Neurology her general condition has been stabilized, she communicates, but her mobility is limited. The pressure ulcer between her shoulder blades heals quite effectively, the manifestations on the cranium are stagnant, the pressure ulcer shows callous margins, and the bone is colored dark brown to black. Since March 2014 the therapy included gel preparations, and we also have commenced stem cell therapy with a very good effect.

### WRITTEN BY LIFE ITSELF...

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Despite the progress made in therapy in the 21<sup>st</sup> century, the Internet and the effort to inform in the media about the well elaborated preventive measures some patients keep “pampering” their wounds and the resulting condition. They sometimes even terrorize their families and their environment. The presentation will discuss conditions, in which any help offered was in vain.

### RAYNAUD'S PHENOMENON – 10 YEARS OF FOLLOW UP BY NAILFOLD CAPILLAROSCOPY

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We would like to contribute to the question: How reliable is generally nailfold capillaroscopy in connection with other methods in prediction of disease development over longer time?

Since 2000 our department has conducted a follow-up study of patients manifesting Raynaud's Phenomenon (RP). These we followed up for 10 years. Our group consisted of 327 cases with a normal capillaroscopy picture, and symptoms of RP. Stable abnormal capillaroscopy findings showed a group of 72 patients. Varying capillaroscopy picture was present at 80 patients.

We found out that the cases showing a clearly normal capillaroscopy picture, left our study classified as Primary RP, having stable results over the period.

All other persons with abnormal findings have to be examined regularly (every 6 months, best with the highest temperature span). There is necessary to apply all possible microcirculation investigation methods (ie. lab tests, Laser Doppler Flowmetry with cold and rewarming procedure, angiography etc.).

During the follow-up period 70 of 72 abnormal findings turned to various forms of Secondary RP. At the transitory group of 80 (varying picture) around one half (36 cases) was confirmed as Secondary RP.

### THE ROLE OF FDG PET/CT IN ANGIOLOGY: CURRENT STATE, CASES FROM DAILY PRACTICE

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The positron emission tomography (PET/CT) with 2-deoxy-2-[18F]fluoro-D-glucose (FDG) is a well established method in oncological diagnostics, where it has become a standard in staging and follow-up of many malignant diseases. FDG is a non-specific metabolic marker. Except in tumorous tissue FDG is accumulating in many of physiological or pathological processes with intensified metabolism, typically in the regions affected by inflammation. That is the reason why FDG PET/CT can be used for the localization of infection and inflammation, as it has been recently proved by increasing volume of literature evidence.

The most frequent use of FDG PET/CT in angiology is in the diagnosis of inflammatory diseases. The most important units are vasculitis, graft infections and inflammation of aneurysms. Assessment of the inflammatory activity of atherosclerotic plaques can have prognostic significance. These diseases frequently represent a diagnostic challenge – they often have discrete clinical symptoms and faint findings on anatomical imaging modalities. Hybrid imaging brings the possibility of targeted imaging of defined processes on the cellular level and can reveal additional information essential for establishing the right diagnosis. However, the role of FDG PET/CT in diagnosis of vascular inflammation is not unequivocally set in the literature or defined in the guidelines of angiological or cardiological societies, although its contribution was documented by many case reports and studies with limited number of patients and it is widely used and accepted modality in the daily practice.

We present an overview of current state of usage of FDG PET/CT in angiology (above mentioned clinical units) and examples from the routine work of our department.

[www.geum.org/angio](http://www.geum.org/angio)

## WHY DO VENOUS ULCERS RECUR?

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Venous leg ulcers are the end stage complication of chronic venous insufficiency. They present a painful, long lasting, treatment refractory and frequently recurring disease.

Their treatment – frequently ineffective – costs billions in the western countries. The cause of frequent recidives is complex:

- the chronic venous hypertension;
- the resulting irreversible trophic changes of the skin;
- and – last but not least – a prolonged inappropriate treatment.

How we can prevent these recurrences?

- the advanced skin changes we can hardly influence;
- the venous hypertension can be, and should be (!) relieved – in some cases by restoring the venous flow, but far more often by eliminating the reflux: in superficial veins, in deep veins and in perforating veins.

In 310 patients with venous ulcers, where no varicose vein or perforator treatment was performed, the recurrence rate in 2 years was 6%, when the reflux in varicose veins and insufficient perforators could be eliminated, it was only 1%.

Finally, what is perhaps most important, finish an incorrect ineffective treatment with ointments, cremes, different appliances, drugs, antibiotics, hyperbaric chambers, etc. without compression.

In principle the persisting venous hypertension is the main cause of venous ulcers recidives. Nevertheless, there are many other factors: first of all the absence of permanent compression, sedentary mode of life with lack of walking, overweight, a.o.

To compensate these problems, we need to reduce the venous hypertension, according to DUSG examination. In authors material outpatient sclerotherapy of varicose veins and insufficient perforators significantly reduced the recurrence rate. Walking promotes the venous return and healing. Absolutely necessary is the appropriate compression.

# EDUKAČNÍ GRANT 2015

**Zaregistrujte se k odběru časopisu na [www.geum.org/angio](http://www.geum.org/angio) a my Vám ho budeme posílat ZDARMA.**

Pro rok 2015 má Nakladatelství GEUM k dispozici edukační grant pro bezplatné zasílání časopisu **Kazuistiky v angiologii** pro **600 lékařů** v praxi odbornosti vnitřní lékařství (včetně všech podoborů, jako je angiology, diabetologie, apod.) a **400 lékařů** v praxi z odbornosti praktický lékař, pokud pečují o nemocné s chorobami cév.

Pokud splňujete následující **3 podmínky**, máte možnost získat letošní předplatné zdarma jen na základě registrace:

1. jste lékař/ka v praxi (ambulance, nemocnice, klinika, lázně)
2. pečujete ve své praxi o nemocné s postižením cév
3. doručovací adresa v ČR

*Edukační grant platí pouze pro registraci lékařů v praxi. Ostatní předplatitelé (instituce, firmy, lékaři mimo praxi) jej mohou objednat za roční předplatné 200 Kč. Údaje získané při registraci budou využity pouze pro komunikaci mezi Vámi a Nakladatelstvím GEUM (a jeho složkami) a nebudou poskytnuty žádným dalším subjektům.*



**KAZUISTIKY  
V ANGIOLOGII**

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