

KAZUISTIKY V ANGIOLOGII

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44. angiologické dny s mezinárodní účastí

Číslo 1

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Milé kolegyně, vážení kolegové,

máte v rukou kongresové číslo časopisu *Kazuistiky v angiologii* s ochutnávkou programu 44. angiologických dnů s mezinárodní účastí ve formě abstraktů některých přednášek a posterů. Dovolte mi, abych Vám za organizační výbor kongresu pestrý program více přiblížila.

Navazujeme na předchozí úspěšné kongresy, přičemž v loňském roce byl náš kongres ryze mezinárodní, v rámci každoročního setkání vaskulárních společností, které jsou členy ESVM (European Society for Vascular Medicine). I v letošním roce bude tato organizace reprezentována dobrými řečníky, ať již z Francie, Německa, Maďarska, Slovenska nebo Itálie. Nicméně letos jde především o národní kongres v českém jazyce.

Těžištěm programu jsou sympozia – ať již tematicky zaměřená na jednotlivé skupiny chorob v rámci členění angiologie (zejména zaměřená na ischemickou chorobu končetin, chronická žilní onemocnění apod.), či sympozia spřátelených společností (hematologové budou mluvit o novinkách v prevenci a léčbě žilní trombózy, hypertenziologové proberou témata týkající se sekundární hypertenze, diabetologové se zaměří na novinky v léčbě diabetické nohy a ukážou nové technologie, lipidologové nám připomenou důležitost těsné korekce dyslipidemie a ukážou nové možnosti intervence, cévní chirurgové přednesou novinky v operativě). Těšit se můžete i na rozsáhlý páteční blok přenosů z katetrizačních sálů z Prahy, Ostravy, Třince a Bratislavy. Tentokrát nepůjde jen o intervence na tepnách, ale nově je zařazen i přenos moderní, rozvíjející se endovaskulární léčby povrchových žil.

Určitou novinkou, určenou zejména pro mladé angiology, je možnost prezentace zajímavých kazuistik v samostatné sekci. Samozřejmě i sestry mají připraveny svůj blok přednášek. Kromě toho budou probíhat workshopy, zaměřené nejen na sonografické vyšetřování tepen a žil. A nenechte si ujít ani malý blok *Pro a proti* na téma *Paclitaxelem potažené balonky a jejich význam pro celkové přežití – pozitivní nebo negativní?*

A stejně jako se nemůže kongres konat bez Vás – aktivních i pasivních účastníků, nemohl by proběhnout bez podpory výrobců léků a zdravotnické techniky, z nichž někteří připravili samostatná minisympozia.

Stejně jako každoročně budou během kongresu oceněni autoři v roce 2018 publikovaných článků a monografií. Proběhne také panelová diskuse se zástupci zdravotních pojišťoven. Proslovena bude i Puchmayerova přednáška, dále přednáška shrnující problematiku cévní medicíny v evropském kontextu a přednáška o stoleté česko-slovenské spolupráci univerzitních pracovišť.

Je pro mne ctí a radostí, že Vás mohu jménem svým i celého výboru České angiologické společnosti co nejsrdečněji uvítat na 44. angiologických dnech v Praze a popřát Vám radost ze setkávání a získání nových odborných poznatků. Děkujeme, že jste vážili cestu do Prahy a doufáme, že nebudete litovat.

Debora Karetová
předsedkyně České angiologické společnosti ČLS JEP



Dear colleagues,

You are holding the special congress issue of the journal “Angiology Case Studies” in your hands. It contains the overview of the programme of the 44th Czech Angiology Days with the international participation in a form of abstracts of some papers and posters. On behalf of the organizing committee I'd like to give you a closer idea to this rich programme.

This congress is a follow up to the earlier successful conferences, where our last congress was purely international, it was held within the annual meeting of vascular societies that are members of ESVM (European Society for Vascular Medicine). This Society will be represented by excellent speakers from France, Germany, Hungary, Slovakia or Italy this year too. Nevertheless, this year's congress will be primarily national congress in the Czech language.

Our programme is centred around symposia—either thematically focused symposia within individual groups of vascular diseases (with particular interest in ischemic lower limb disease, chronic venous diseases, etc), or symposia of our related societies (i.e. haematologists will speak about news in the prevention and treatment of venous thrombosis; experts in hypertension will discuss issues of secondary hypertension; diabetologists will focus on the news in the treatment of diabetic foot syndrome and they will show us some novel technologies; experts in lipid metabolism will remind us how important is to maintain the tight correction of dyslipidemia and they will show us the novel options of therapeutic interventions; and vascular surgeons will present the news in surgical procedures).

You may also look forward to a large set of broadcasts from cath labs in Prague, Ostrava, Třinec and Bratislava on Friday. The broadcasts won't be only about arterial interventions, but you may watch a modern, developing endovascular treatment of superficial veins this year. A certain novelty that is intended mainly for younger angiologists is a possibility to present their interesting case reports in a separate section. Certainly, nurses have prepared their own set of lectures too. Besides that, there will be workshops focused on ultrasound examinations of arteries and veins. And please don't miss a small section named *Pros and cons* focused on *Paclitaxel-coated balloons and their significance for the overall survival—is it positive or negative?*

In the same manner as the conference couldn't be held without you—the active and passive participants, it couldn't be held without the support of pharmaceutical companies and medical technology manufacturers, some of who have prepared their separate mini-symposia.

As every year, the authors of papers and monographs will be awarded during the congress. Also, the panel discussion with representatives of health insurance companies will take place. Puchmayer's lecture will be presented, as well as the lecture summarizing vascular medicine topics within a European context, and the lecture about hundred year lasting cooperation between the Czech and Slovak University Departments.

It is my honor and pleasure to give you a warm welcome to the 44th Czech Angiology Days in Prague both personally and on behalf of the whole committee of the Czech Angiology Society. We would like to wish you productive meetings and gathering new professional knowledge. We would like to thank you for coming to Prague and we hope that you won't regret it.

Debora Karetová
President of the Czech Angiology Society ČLS JEP



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HOW WE CAN REDUCE THE INCIDENCE OF POSTTHROMBOTIC SYNDROME

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The study was initiated following the observation of complete recanalisation of thrombus in subjects with DVT treated with rivaroxaban after 1–2 weeks. The aim of this observational retrospective study was to evaluate clinically and by means of Echo colour Duplex the fibrinolytic effect of rivaroxaban in patients with recent and previous DVT.

To accomplish this, two populations of patients were evaluated. Group 1 was comprised of 31 patients (ranging from age 52 to 73 years) with popliteal-femoral DVT (12 months ago) treated with standard anticoagulant therapy. In these patients we found a complete superficial femoral recanalisation and partial recanalisation of the popliteal vein (30% of residual thrombus). These patients had normal creatinine clearance and liver function. Their therapy was switched from warfarin to rivaroxaban due to a lack of compliance with the warfarin therapy. Group 2 was comprised of 22 patients (ranging in age 65–82 years) with previous popliteal-femoral DVT and documented complete common femoral veins recanalisation and presented with a recent superficial femoral vein re-thrombosis (1 week before). These patients had normal creatinine clearance and liver function. Their therapy was switched from warfarin to rivaroxaban due to a lack of compliance with the warfarin therapy.

In Group 1 all patients exhibited the complete recanalisation of the popliteal veins after 4 weeks of the rivaroxaban therapy. In groups 2 all patients exhibited the complete recanalisation of the popliteal veins after 4 weeks, and the complete recanalisation of the acute re-thrombosis of the superficial femoral veins after 2 weeks of the rivaroxaban therapy.

No adverse events for both groups were observed.

Our results suggest that rivaroxaban could have a pro-fibrinolytic effect not only on the recent thrombus but also on the organised thrombus that results in a complete recanalisation of affected veins. It is proposed that this lytic effect will preserve venous valve structure and lead to a reduction of the incidence of post-thrombotic syndrome in rivaroxaban treated patients.

LARGE VESSEL VASCULITIS

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Large vessel vasculitis is a group of inflammatory diseases affecting the aorta and its major branches. They include primary large vessel vasculitis (Giant cell arteritis and Takayasu arteritis). Clinical manifestation is initially non-specific, patients may show with flu-like symptoms. Specific symptoms arise from downstream tissue ischaemia of the affected vessel.

Swollen arteria temporalis or visual impairment is one of the specific symptoms of Giant cell vasculitis (GCA). Upper limb claudication or different blood pressure in the arms is typical for Takayasu arteritis. The main criterion of how to differentiate these two clinical units is the age of onset. GCA occurs in elderly patients over 50 years old, TA occurs in patients younger than 40 years old. The key for establishing the diagnosis is mainly PET-CT. Ultrasonography shows vasculitis-specific homogeneous circumferential wall swelling and luminal narrowing which can be precisely detected by CT angiography. Laboratory finding is the elevation of inflammatory markers (CRP, ESR). These methods are also used in the monitoring of disease activity, but no exact algorithm on how to follow up these patients is currently available. The mainstay in therapy is immunosuppression with glucocorticoids.

Special biological agents, particularly anti-TNF α effective in TA therapy, anti-IL-6 and abatacept, a CTLA4 molecule fused with a part of IgG1 effective in GCA therapy, are now at the forefront of the therapeutic interest. Biological treatment is currently applied in the 2nd or 3rd line of treatment when glucocorticoids lose efficacy. Revascularisation should be performed in the inactive phase of the disease.

The group of patients at the 2nd Internal Dept., General Hospital in Prague, followed up from 2013, consists of 27 patients, 19 women and 8 men with an average age of 60 years old. In most of them the diagnosis was established by PET-CT, only in few of them via *a. temporalis* biopsy. We assume that most of the patients are diagnosed with GCA mainly because of the higher age (n=23). Aorta is also frequently affected in this group of patients. TA has been diagnosed in 4 patients, 3 of them are women with an average age of 26 years. All of the patients were treated by immunosuppression with glucocorticoids, 8 patients by combination of immunosuppression. 7 patient reached remission. Intervention was performed in 3 patients. One patient died at the age of 67.

Many questions still remain unanswered especially in monitoring of the disease activity. PET-CT is quite expensive, so we need to reveal new laboratory markers of arterial inflammation and damage (matrix metalloproteinase, etc.), correlate them with common signs of inflammation and imaging methods to determine disease activity and to optimize the treatment.

EARLY AND NON-INVASIVE DETECTION OF ENDOTHELIAL DYSFUNCTION WITH SPECIFIC FOCUS ON DIABETIC PATIENTS

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Cardiovascular diseases are the most common cause of death and physical incapacity in many countries, with vascular obstructive stenosis affecting cerebrovascular, coronary and other arterial territories. High cardiovascular risk people, like smokers or those suffering from diabetes mellitus, are victims of lower limbs arterial obstructive disease, which courses a long period in absence of both symptoms or clinical evidence. Early-stage diagnosis, obtained through non-invasive strategies has been proposed as a means of diagnosing incipient vascular occlusion. The objective of this paper is to provide an overview of existing telemedical programs aimed early and non-invasive detection of major cardiovascular risk factors with specific focus on lower limb perfusion and the corresponding improved chance for patients to reverse the pathological processes in time. The survey will cover several telemedical programs both in the Czech Republic and in other countries like Brasil including a comparison of results.

PULMONARY EMBOLISM CAUSED BY ASYMPTOMATIC ANEURYSM OF POPLITEAL VEIN

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The presented case-report describes a 41-year-old man who was admitted to hospital with bilateral pulmonary embolism, manifested by progressive dyspnea during usual walking.

This symptom lasted about 24 hours and no other symptoms and signs were observed before (i.e. leg pain or swelling).

CT angiography was performed with a finding of bilateral pulmonary embolism and acute *cor pulmonale*, confirmed by echocardiography. Since there were initially no signs of haemodynamic instability, the i.v. anticoagulant treatment was started with a transient improvement of subjective trouble and right ventricular dysfunction as well. But during the first day haemodynamic deterioration and a progression of right ventricular dysfunction occurred and this was the reason for system thrombolytic treatment with a fast positive effect.

Meanwhile, an ultrasound examination was performed to detect the source of pulmonary embolism. The ultrasound examination found deep vein thrombosis located in the calf veins, small saphenous vein and a large aneurysm of popliteal vein, which has been without symptoms so far.

The patient was discharged in a good condition with oral anticoagulant treatment, in the same time the treatment of newly diagnosed arterial hypertension and dyslipidemia was started. An examination of congenital thrombophilia was performed as well, the result of that was negative.

After 4 months, when echocardiography was normalized and thrombotic vein matter was dissolved, the patient underwent an uncomplicated surgery resection of popliteal vein aneurysm.

Now, a year after the surgery, the patient's condition is very good, without a subjective problem and without any objective signs of chronic venous insufficiency.

ACUTE PAINFUL BLUE FINGER SYNDROME: A DIAGNOSTIC CHALLENGE

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Introduction: An acute blue finger syndrome is a rare pathology with a risk of recurrence and tissue loss.

Case report: A 41-year-old female was admitted to our outpatient department with a painful acute bluish discoloration of her left thumb and left little finger (Fig.1). She did not have any similar episodes in the past.



Fig. 1: Blue finger syndrome

Her systemic examination, complete blood count, renal and liver functions, electrocardiogram, and chest X-ray were normal. Her erythrocyte sedimentation rate was increased.

Antinuclear antibody and extractable nuclear antigen antibody were positive.

Doppler and duplex study of her both upper limb vessels and brachial-brachial wrist index was also normal. Transesophageal echocardiography found PFO (foramen ovale patent) (Fig. 2). We did not find venous thrombosis. Capillaroscopy showed pictures of mega capillaries (Fig. 3).

Treatment and conclusion: Our patient was treated with low molecular weight heparin and Prostvasin. We are planning to close the PFO with an occluder.

She will be monitored by a rheumatologist for a possible diagnosis of systemic scleroderma, but for now she is without a specific treatment.

Vascular supply of each finger is terminal, which is why peripheral embolism is associated with a poor prognosis.

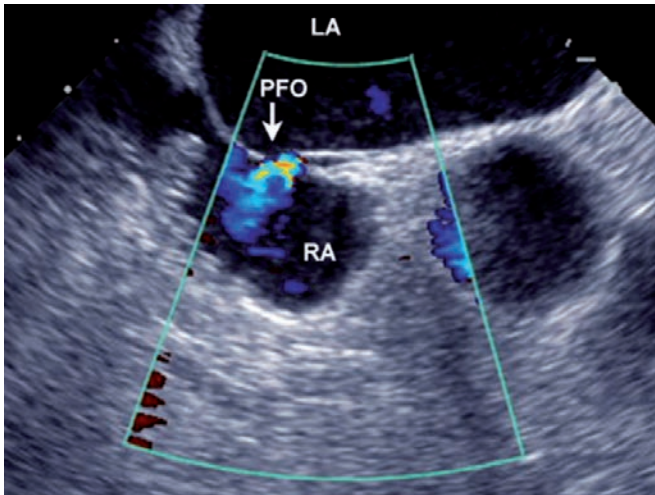


Fig. 2: Foramen ovale patent (ECHO Lab IKEM)

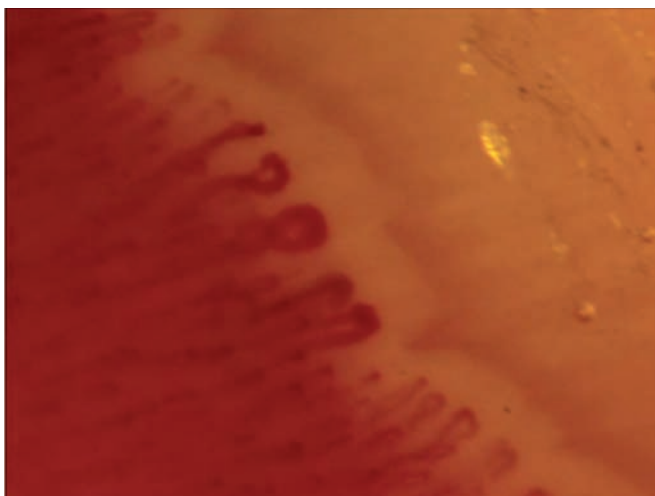


Fig. 3: Mega capillaries

AORTO-ILIAC ENDARTERECTOMY: ALTERNATE SURGICAL TECHNIQUE

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Aorto-iliac occlusive disease is best treated with endovascular angioplasty/stenting or with surgical bypass, depending on the disease severity. Aorto-iliac endarterectomy was frequently used until the 1980s. However, it can still be performed in cases of previous failure or contraindication of standard methods. The aim was a retrospective evaluation of a single-centre case series of aorto-iliac endarterectomy.

Nine patients at the mean age 60 ± 8 years (46–71 years) were treated by aorto-iliac endarterectomy between 2013 and 2018. Rutherford categories of leg ischaemia were 2 (moderate claudication) 3×, 3 (severe claudication) 2×, 4 (rest pain) 1×, 5 (toe gangrene) 2× and acute limb ischaemia 1×. The reasons for endarterectomy approach were: late in-stent iliac occlusion in an oncology patient, failure or complication of a previous endovascular treatment of short iliac stenosis 3×, high infection risk of prosthesis use in long iliac-femoral occlusion 2×, and short iliac occlusions 3×. Two patients after a previous organ transplant were on immunosuppression.

Technical success rate was 100%. There was no peri-operative (≤ 30 days) death or amputation. Mean follow-up was 15.2 months (15 days–3.6 year). One patient required an additional tibial bypass 1 month after endarterectomy to heal foot gangrene. Two patients developed a symptomatic re-stenosis which was treated with iliac stenting 8 months and 14 months after the procedure, respectively. One patient was early lost to follow-up. All other patients clinically improved and recovered from leg ischaemia. Two patients died of tumour with preserved limb 1.1 month and 3.1 years after the procedure, respectively. Six remaining patients are asymptomatic with a patent revascularisation to date.

Aorto-iliac endarterectomy is a vital alternative technique for revascularisation in selected patients when other methods seem inappropriate. However, restenosis may occur in mid-term follow-up.

INFERIOR VENA CAVA ATRESIA AS A RISK FACTOR OF DEEP VEIN THROMBOSIS

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Inferior vena cava atresia (IVCA) is rare in general population. Its prevalence is not higher than 1%. The prevalence is much higher (about 5%) in selected population, mainly in young men (under the age of 30) presenting with idiopathic deep vein thrombosis or pulmonary embolisation. The cause of IVCA is either congenital or based on intrauterine or peripartum thrombosis.

We are presenting a case report of a patient with idiopathic low-risk pulmonary embolisation. Thrombosis of internal iliac vein based on IVCA was verified as a source of the embolisation. It is possible to say, that this is a typical clinical manifestation of thromboembolic disease, because of the congenital abnormality of deep vein system. The patient was a young 23-year-old man with an absence of severe internal diseases, screened major thrombophilias were ruled out, duplex sonography ruled out deep venous thrombosis of lower extremities and finally CT phlebography verified the most common collateral pathway (so called internal pathway)–lumbar and intercostal veins and vena azygos and hemiazygos.

We are also presenting a discussion of literature-based data for duration, form of anticoagulant treatment and prevention of recurrence of deep vein thrombosis.

OBESITY AND CLIMATE CHANGE

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Obesity leads to severe acute and long-term health consequences and increases the cost of social care. Several studies have highlighted the link between obesity and changing climatic conditions.

We try to illustrate the problem by a case report of an extremely obese 62-year-old woman, a former smoker, a hypertensive patient, after a heart attack with an implanted pacemaker, a diabetic, for several years in a chronic dialysis program. The reason for admission was an unbalanced hypertension. The patient was extremely obese (height of 157 cm, weight of 135 kg, BMI was 54.7 kg/m², waist circumference 160 cm).

All examinations and therapies have become difficult during the hospitalization. Sometimes we faced almost irresolvable situations, for example when the patient fell to the floor at night,

and the currently attended medical staff could not pick her up. We had to wait for 3 hours until the second shift of the attending staff arrived to put the patient back on the bed. Patient died despite the excessive medical effort. Pathological anatomical autopsy was not performed.

Our patient moved from north-eastern Slovakia to Bratislava in early July 2017 in the hope of better care and support. While in the city she came from the maximum temperature in the first half of August 2017 around 33 °C. In Bratislava, where she came to live with her daughter in early July, it was up to 40 °C. We believe that the extremely obese patient has been terribly intolerant of these temperature records, which seems to have been signified by a worsening of her health condition.

The growing level of income and the consequences of globalisation have led to a rapid increase in obesity and vice versa a consumer's lifestyle contributes to climate change. The health care system should be prepared to deal with the obesity epidemic.

ENDOVASCULAR TREATMENT OF AN ISOLATED COMMON ILIAC ARTERY DISSECTION IN A 38-YEAR-OLD PATIENT

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Isolated iliac artery dissection (ISIAD) without the involvement of aorta is a rare medical condition. The causes for this condition can be classified as either traumatic or non-traumatic. The “non-traumatic” group of medical conditions that causes ISIAD are various connective tissue disorders (CTD) such as Marfan syndrome, Ehlers-Danlos syndrome, fibromuscular dysplasia, cystic medial degeneration Erdheim-Gsell and atherosclerosis.

Case presentation: A 38-year-old male patient was referred to our centre for a sudden onset of rest pain and paraesthesia on the right lower limb (RLL). Upon admission, the RLL was pulseless with mild paraesthesia in the foot. Acute limb ischaemia was classified as clinical Rutherford grade IIb. Left lower limb showed no signs of ischaemia with palpable peripheral pulsation on the anterior tibial artery and left dorsal artery of the foot. The patient underwent a computed tomography angiography (CTA) revealing an isolated common iliac artery dissection (CIA).

The patient was indicated for an endovascular repair. The procedure was performed through the contralateral groin under local anaesthesia. Through a 6 French sheath, a hydrophilic guidewire was used to cross through the true lumen of the dis-

sected CIA into the common femoral artery. The entry of the dissection was localised in the right distal CIA above the iliac bifurcation. The proximal part of the EIA was spastic without an atherosclerotic infiltration. The entry of the dissected CIA and proximal part of the EIA were treated with self-expanding nitinol stent. The patient's collagen connective tissue workup was negative. Postprocedural hospital stay was uneventful. No reperfusion compartment syndrome occurred after the procedure. The patient was discharged on the 3rd post-procedural day with palpable peripheral pulsation. The patient was given a daily dose of 100 mg of acetylsalicylic acid (Aspirin).

Endovascular treatment of ISIAD is a viable treatment modality with low periprocedural complications, mortality and morbidity.

HEPARIN INDUCED THROMBOCYTOPENIA TREATED WITH FONDAPARINUX – SINGLE CENTRE EXPERIENCE

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Heparin-induced thrombocytopenia (HIT) is the most frequent drug-induced, immune-mediated type of thrombocytopenia which is associated with significant morbidity and mortality. Substances belonging to the appropriate anticoagulation therapy are lepirudin, danaparoid or argatroban. Fondaparinux has also been successfully used in HIT.

We present a cohort of 10 patients (8 males, 2 females, the mean age of 67 years old and the age range 46–86 years old) with HIT. All patients were safely and effectively treated with fondaparinux, even in case of a severe renal impairment.

Diagnosis of HIT was based on Keeling's scoring, screening immunological test for HIT (STic EXPERT[®] HIT) and sandwich ELISA (detection IgG/heparin-PF4).

Results: tab. 1.

The treatment of HIT should start as soon as a 4T score of ≥ 4 or more is calculated. The first step is the discontinuation of heparin and a treatment with an alternative anticoagulant should be introduced. Substances belonging to the appropriate anticoagulation therapy indicated for patients with HIT are lepirudin, danaparoid or argatroban. Unfortunately, none of these compounds are immediately and routinely available in the vast majority of Czech hospitals. Therefore, fondaparinux remains the therapy of choice in this scenario.

Fondaparinux and DOACs are emerging as major HIT treatment options, in spite of the absence of regulatory approval for the treatment of HIT. More data from randomized controlled trials are needed.

ROBOTIC VASCULAR SURGERY – ITS ROLE IN PRESENT TIME

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The aim of this presentation is to compare the surgical method with robotic, laparoscopic and open surgical approach to the treatment diseases of the abdominal aorta and its branches.

Tab. 1.

Age (years)	Diagnosis	LMWH dose	Duration till HIT (days) Drop of Plt (10 ⁹ /l)	HIT manifestation	Fondaparinux Dose and duration (days)	Time to platelet recovery (days)	Further anticoagulation
66	Tumour rectosegmoideus + acute proximal DVT	Therapeutic	6 260/86	Rethrombosis	Therapeutic 7.5 mg, 5 days	5	dabigatran
66	Adenocarcinoma lungs	Prophylactic	9 270/110	Thrombosis DVT	2.5 mg every other day	26 till death	-
56	Femoral DVT	Therapeutic	6 188/62	Re thrombosis	Therapeutic 7.5 mg, 7 days	7	dabigatran
46	Femoral DVT	Therapeutic	6 175/52	Re thrombosis	Therapeutic 7.5 mg, 5 days	5	apixaban
68	AF, valve replacement	Therapeutic	8 225/31	Thrombosis DVT	Therapeutic 7.5 mg, 6 days	6	warfarin
77	Femoral DVT, underlying malignancy – colon	Therapeutic	13 185/44	Re thrombosis	Therapeutic 10 mg, 6 days	6	rivaroxaban
86	Erysipelas	Prophylactic	14 371/45	Skin necrosis	Prophylactic 2.5 mg, 21 days	7	none
64	TKR – total knee replacement	Prophylactic	5 176/76	Skin necrosis	Prophylactic 2.5 mg for 3 days, then 10 mg 3 days	6	rivaroxaban
71	Acute glomerulonephritis	UFH flush, dialysis	9 224/27	Thrombosis DVT	Prophylactic 2.5 mg every other day	16 (other cause of thrombocytopenia)	none
68	Head injury	Prophylactic	14 225/57	Thrombocytopenia	Prophylactic 2.5 mg 6 days	6	none

We performed 445 robotic vascular procedures in our hospital between 2005 and 2018. The range of operations included a reconstructive surgery for aneurysms, deliberations of *truncus coeliacus*, type II endoleak solutions and other hybrid procedures. The mortality rate was 0.2%, postoperative complications occurred in 2.3% of cases and conversions to open surgery were required in 5% of cases.

Robotic operations in vascular surgery are very successful and patient-friendly. Of course a further development of this mini-invasive vascular surgery is obvious. It should be concentrated to specialized centres with a sufficient erudition of a surgeon in significant number of procedures. Czech robotic centres perform these operations in varying numbers, but comparably with other world centres. A sign of success of these methods is a minimum of complications, a shortened hospital stay and a better recovery time. These consequences are different in other countries according to the health and social system.

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EMERGENCY CAROTID SURGERY – FACTORS INFLUENCING INDICATION

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Indication for carotis artery surgery has been an evergreen topic. Factors influencing the intervention are related to surgical techniques, to the real value of carotid artery stenting, to the grade of stenosis and the quality of plaque and the increasing role of the best medical treatment.

Unfortunately, prospective randomized studies have paid less attention to the wide range of plaque surface related instability and to individual differences of the Willis circle capacity. These factors may be decisive in indication and timing of any intervention.

At our department we have about 350 carotis artery surgical reconstructions in a year.

28% of our interventions have been done urgently. A real acute intervention is rarely indicated for injuries and/or acute occlusions. The so called urgent surgery represents the majority of these cases.

Factors indicating emergency surgery:

1. unstable neurology
 - repeated TIA and stroke in evolution – in some cases of small extension
 - fresh cerebral deficit
2. vulnerable plaque – with or without symptoms
 - exulcerated plaque with thrombotic apposition
 - haemorrhagic plaque
 - plaque dissection

In our practice for a primary intervention we prefer eversion endarterectomy. Primary CAS would be done in unfit patients in case of a hostile dissection of carotid artery (FMD, trauma).
3. interrupted or very low capacity of Willis circle with high grade ICA stenosis with or without symptoms

If Willis circle is patent with good caliber communicating arteries, the intracranial arterial pressure decreases the stream velocity within the stenotic area and poststenotic ICA.

This situation promotes ICA occlusion – without any symptoms. If no or low capacity communicating arteries are present at the Willis circle, the poststenotic low pressure enhances the speed of stream at the stenotic area and increases shear stress at the plaque surface enhancing a risk of embolisation and development of focal or extended cerebral necrosis with neurological deficit.

Based on the professional philosophy above, we achieved a postoperative stroke rate 1.5% with a 3% wound bleeding rate requiring hematome evacuation. Transitory peripheral nerve damage 8%, permanent 1%.

THE STENT GRAFT USE IN TREATMENT OF OPEN SURGICAL COMPLICATIONS IN THE AORTO-ILIAC AREA

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Endovascular treatment with stent grafts is one of the methods used to treat abdominal aortic and iliac artery aneurysm. It is known that elderly patients benefit from endovascular procedures rather than from an open surgery, as do patients suffering from co-morbidities such as severe COPD and heart and renal failure. Endovascular treatment can also solve complications, which happen after previous open procedures, since these patients are at a higher risk for open surgery.

From 2000 to the first half of 2018, we identified 62 patients, who underwent an open surgery for aneurysm in the aorto-iliac area. Some of them developed an aneurysmal dilatation on the adjacent artery during the follow-up, others formed a false aneurysm in the anastomosis of the initial vascular substitution. Endovascular treatment was indicated and performed. Retrospectively we have collected and evaluated data about this group of patients.

In all cases the stent graft implantation was technically successful.

Endovascular approach provides an option for a therapy with less risk than an open surgery in some demanding cases, which were previously solved only by an open surgery. The authors present case reports from their own group of patients treated by a stent graft.

THE OCCLUSIVE PLETHYSMOGRAPHY AND ITS ASSOCIATION WITH MICRO- AND MACROCIRCULATION PARAMETERS IN PATIENTS WITH DIABETIC FOOT

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The diagnosis of peripheral arterial disease (PAD) is a key point in the diabetic foot management. The aim of our study was to assess the possible association of a newly introduced device – the occlusive plethysmography with some parameters of micro- and macrocirculation in patients with DF (the diabetic foot).

We have included 36 patients with DF (mean age 66.1 ± 10.6 years, diabetes duration 23.3 ± 10.9 years, HbA_{1c} 63.6 ± 20.7 mmol/mol) into our study, who were treated in our outpatient foot clinic and underwent in total 111 uni- or bilateral measurements of the occlusive plethysmography (assessing calf flows through major arteries (p1) and arterioles and capillaries (p2) after the proximal occlusion) combined with evaluations of micro – (detected by transcutaneous oxygen tension – $TcPO_2$) and macrocirculation (by duplex ultrasound/angiography). Based on the duplex ultrasound/angiography findings, patients were divided into two study groups – patients with monophasic flow or obliteration in proximal arteries (AFS, AP – group M) and those with triphasic flow without significant stenosis in evaluated proximal parts (group T).

Postocclusive calf flows through major arteries (p1) were significantly lower in group M in contrast to subjects from group T (50.7 ± 25.5 vs. 70.9 ± 46.9 mL/min; $p=0.012$). However, postocclusive calf flows through arterioles and capillaries (p2) did not differ significantly between both study groups (22.8 ± 15.9 vs. 24 ± 23.3 mL/min; NS). The study group M revealed significantly lower $TcPO_2$ values in contrast to group T (32.2 ± 18 vs. 45.9 ± 16.1 mmHg; $p=0.03$). But when we subanalysed study subjects based on the $TcPO_2$ values, those patients with unsatisfied microcirculation status ($TcPO_2 < 40$ mmHg) had paradoxically higher postocclusive calf flow in arterioles and capillaries in contrast to patients with $TcPO_2 \geq 40$ mmHg (33.9 ± 25.9 vs. 18.8 ± 13.5 mL/min; $p=0.0007$).

Findings of the occlusive plethysmography corresponded better with changes in macrocirculation in patients with the diabetic foot. Patients with altered microcirculation had higher postocclusive calf flow through arterioles and capillaries probably due to better arteriogenesis in their calves.

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THE ACTIVE FUNCTION OF VENOUS BRAIN SYSTEM ON HAEMODYNAMIC BRAIN CIRCULATION

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Based on anatomical and biomechanical studies, creating models of brain venous system and studies of biomechanical and histological quality of dura mater with ascertainment of lymphatic system in dura mater, a hypothesis and then a theory about active function of the venous brain system on haemodynamic brain circulation and more functions of outflow vessels structures of the brain was stepwise created.

A study, which proved the influence of angiosynthesis, self-oscillation of the vessel's wall, on active outflow of brain vessels, was made. Further away, we studied the physiology of cavernous sinus together with the whole sinuses brain system and immunologic function and the influence of venous and lymphatic systems on liquorodynamic function.

Venous physiology aspects: haemodynamic regulation – Starling resistor, a combination of bridging veins, venous brain system and venous brain sinuses – primarily cavernous sinus (“physiological jewellery box”) as a pulsing pump, thermodynamic part of the brain influencing brain liquorodynamic functions (liquor production, absorption and flow). The important influence is so-called “movement of the brain” on bridging veins system, another important effect is electromagnetic continuum on bridging brain veins as muscular type of veins.

The studies of dura mater show physiological quality of this structure of brain wrappers not only as protective structures, but also structures influencing liquorodynamic, haemodynamic, immunologic and electrophysiological functions, further participating together on the brain thermodynamic function. The system of lymphatic dura mater structures is important, both from liquorodynamic aspect and immunologic functions.

The whole study brings a new view on the brain vessel system physiology and its outflow part as a greatly active constituent.

THROMBOEMBOLIC PROPHYLAXIS IN NEUROSURGICAL PATIENTS

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Prophylaxis of thromboembolism in neurosurgical patients remains a difficult problem as the anticoagulant treatment increases the inherent risk of haemorrhage into the operative site. Neurosurgical patients constitute one of the highest risk groups for postoperative thromboembolic complications. Physical methods of thromboprophylaxis have been successful

in reducing the incidence of postoperative deep vein thrombosis, but the residual incidence remains considerable. Postoperative regimen avoids the risk of surgical haemorrhage and appears to offer increased protection for this group of patients.

We began with systematic thromboembolic prophylaxis in 1997. Since then we have observed 11,663 patients with cranio-cerebral surgery, including 3,888 patients with skull base procedures.

Our methods of prophylaxis combine mechanical compression stockings and low-molecular-weight-heparin (LMWH) and water internal body management of patients. We have 2 groups for prophylaxis in craniocerebral procedures: elective and urgent.

In the elective group we start with the LMWH prophylactic therapy early (6–10 hours after the surgery), after a postoperative CT control without a haemorrhagic complication (made 4–8 hours after the surgery). Mechanical compression stockings are applied before the surgery and worn for at least 4–5 days after the surgery, when the patient walks normally.

In the urgent group and the group with haemorrhagic complications we start with prophylactic treatment later, after 72 hours. Mechanical compression stockings are applied before the surgery and worn as long as needed.

Our results of pulmonary embolism: 8 cases in the whole series (0.06%) and only 1 death (0.008%). In the skull base group 2 cases (0.05%). In the group with haemorrhagic complications 4 patients (0.03%) and 1 death (0.008%) because of a massive PE and massive haemorrhagic complications during the therapy.

In our group, evolution of fibrinogen level is very important. We observed an important dualistic process in the treatment: thrombotic and thrombolytic at one time.

The author consults this problem with literature.

SUPERFICIAL VEIN THROMBOSIS AND CANCER

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The potential association of cancer with superficial vein thrombosis (SVT) has been far less studied than that with deep vein thrombosis (DVT).

The aim of our study was to assess the prevalence of active malignancy in patients diagnosed with SVT of legs, to evaluate types of malignancies and characteristics of subjects with active cancer and SVT and, moreover, to compare groups with cancer associated SVT and cancer associated DVT.

We perform a single-centre retrospective study of prospectively collected data. Patients treated at the thrombosis clinic from 2006 to 2018 were divided into three groups – those with

isolated SVT (n=191); SVT with concurrent DVT and/or pulmonary embolism (PE) – (n=85); those with DVT (n=785). In these three groups we evaluated the prevalence of active malignancy (i.e. diagnosed in 12 months or less prior to thrombosis and/or ongoing antitumour therapy), the type of tumour, demographic and clinical characteristics of patients.

The prevalence of active malignancy was 4.2% in patients with isolated SVT (the most frequent type of malignancy was breast cancer); 13.1% in those with SVT and concurrent DVT/PE (mainly breast and urinary tract cancer); and 8.9% in patients with DVT (prostate, colorectal, lung cancer and haematologic diseases). The mean age in the group with SVT and cancer was 61.5; in SVT with DVT/PE and cancer 68.8; in DVT and cancer 68.3 years. Females represented 75% of patients with SVT and cancer, 37.5% in SVT with DVT/PE and cancer and 30% in DVT and cancer.

Conclusion: The prevalence of active cancer in patients with isolated SVT compared to those with DVT is lower but not negligible. The difference in gender distribution between cancer associated SVT and cancer associated DVT requires further investigation.

RELATIONSHIP BETWEEN CARDIOVASCULAR DISEASE AND COGNITIVE FUNCTION IN EASTERN EUROPE

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Maintained cognitive function (CF) is one of the most important criteria for healthy ageing. The link between CF and CVD morbidity or mortality is rarely examined outside of Western Europe or North America, and to date no such studies have been carried out in Eastern European populations. The aim of our study was to assess the relationship between previously diagnosed CVD and CF, as well as between CF and CVD mortality in ageing Eastern European population samples.

Data was used from Russian, Czech, Polish and Lithuanian individuals (age 45–69 at baseline) who participated in the Health Alcohol and Psychosocial factors In Eastern Europe (HAPIEE) prospective cohort study (n=25,128). Memory, verbal fluency, and processing speed of participants was assessed at baseline and three years later. Data on pre-existing CVD was collected via self-report and mortality during follow-up was ascertained by a linkage with death registers.

In multivariable adjusted logistic regression models, participants with high combined cognitive function scores were less likely to have reported CHD (OR: 0.78; 95%CI: 0.68–0.90) or stroke (OR: 0.38; 95%CI: 0.30–0.49) in their medical history. In longitudinal models, a higher CF score was significantly related to a lower risk of CVD (HR: 0.50; 95%CI: 0.40–0.62), CHD (HR: 0.54; 95%CI: 0.41–0.72) and stroke (HR: 0.26; 95%CI: 0.14–0.49) mortality.

In this prospective analysis of Eastern European individuals, we found that cognitive function was strongly related to both pre-existing CVD and CVD mortality. Further research is needed to explore the exact pathways of how CVD and cognitive function impact each other.

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ARTERIA BRACHIOULNARIS

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Variations of principal arterial trunks of the upper extremity should be considered when performing catheterisation via the *arteria radialis* and *arteria ulnaris*. They comprise variations in the branching pattern, course as well as tortuosities, loops, hypoplasia or absence. The *arteria brachioulnaris* is the second most common variant, reported in approximately 3–5% of cases. By definition, it is the *arteria ulnaris* with a “high origin”, located proximally to the *fossa cubitalis*. It typically courses more ventrally and medially to the proper *arteria brachialis*. It can be classified either as the proper *arteria brachioulnaris* (showing typical course of the *arteria radialis* in the forearm but very rare) or as the *arteria brachioulnaris superficialis* (crossing over the flexor tendons). It can originate within the arm in the *fossa axillaris*, but most commonly is branching in the distal third of the arm. The anatomical knowledge of the *arteria brachioulnaris* is fundamental and necessary for surgical, radiodiagnostic, interventional, and traumatologic procedures.

Supported by Charles University in Prague, Project PROGRES Q37.

TROMBOSIS OF THE ANEURYSM OF VENA POPLITEA AS A CAUSE OF PULMONARY EMBOLISM

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Pulmonary embolism is a life-threatening disease caused by an obstruction of the *a. pulmonalis* or its branches. The clinical process can vary from a clinical mute form to a circulatory arrest. Most often there is a thromboembolic obstruction, less often a fat embolism or embolus with amniotic fluid.

About 90% of emboli come from the proximal leg deep vein thrombosis or pelvic vein thrombosis.

The following is a case report of a 54-year-old woman treated for phlegmona of the right popliteal area and hospitalized with tachypnoea, chest pain, and changes on ECG. It must be noted that the patient's clinical state was impaired by her given state of anxiety. Lab test results showed high levels of D-dimer, TnT – which combined with clinical symptoms lead to a suspicion of PE. CT pulmonary angiography confirmed this diagnosis.

Echocardiography assessed the right ventricular dilatation and right ventricular dysfunction and pulmonary hypertension. Anticoagulant therapy LMWH was initiated. During the hospitalization, it was gradually replaced by NOAC.

Duplex ultrasound of legs indicated a popliteal vein aneurysm (size 20x30x28 mm) with residuum of venous thrombosis.

Standard PE therapy has lead to the normalization of echocardiographic findings without signs of pulmonary hypertension, to the complete thrombosis resorption and stationary aneurysm.

Within a few months, the aneurysm of the popliteal vein has resolved in a surgical resection and subsequent end-to-end anastomosis. Perioperative development of severe paresis of the *n. peronues* on the right leg.

The case report points to an unusual location of DVT origin. Venous aneurysms are a very rare anomaly that is most often found on lower extremities. Popliteal venous aneurysms are very rare and most often asymptomatic. However, they can be discovered due to pulmonary embolism, which can occur despite an effective anticoagulation therapy. The surgical removal of aneurysm in symptomatic patients is therefore important. Randomly captured asymptomatic aneurysms require an ultrasonic monitoring.

OPTIMAL MANAGEMENT OF ANXIETY AND PAIN DURING ENDOVENOUS THERMAL ABLATION OF VARICOSE VEINS

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Anxiety is common to all surgical procedures and being awake can increase it. Anxiety increases pain during and after surgery, increases analgetic requirements and delays recovery.

Endovenous thermal ablation of truncal varicose veins of lower extremities is nowadays considered a gold standard of treatment. Possible causes of pain during the procedure include the procedure itself and the introduction of necessary anesthesia as well (tumescence local anesthesia). An older generation of haemoglobin specific lasers combined with bare fibers require higher power which causes more pain during the procedure. Modern water specific lasers combined with radial emitting fibers can achieve excellent results with lower power and with much less pain.

To reduce anxiety and pain during the varicose veins surgery under tumescence local anesthesia there is little or no benefit using the EMLA cream locally, changing the temperature of the anesthetic solution or even changing the anesthetic itself (lidocaine = bupivacaine = ropivacaine). On the other hand, a significant benefit can be a meticulous explanation of the procedure during a pre-operative examination, a positive temper during the procedure and a verbal interaction between the operating team and the patient, the use of a fine needle and a perfusion pump with a slow speed and a light sedation in some cases.

Using per-procedural hypnosis, stress balls and hand reflexology such as modern IT technologies (iPad, 3D goggles) could be promising but not enough proved in everyday practice.

EMBOLISATION IN A PAEDIATRIC PATIENT – A CASE REPORT

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Having been bitten by a pit bull, a 10-year-old girl underwent a cervical spinal fusion surgery in 2016, followed by a spinal hardware removal two years later. Subsequently, an acute cerebrovascular accident occurred. MRI showed mild ischaemic changes in the pons area of the brain, and a basilar artery occlusion. Acute cerebral angiography and mechanical thrombectomy were indicated. After a complete recanalisation the patient showed no marks of a neurologic deficit with mild ischaemic changes in the pons, in both cerebellar hemispheres, thalamus and in the left posterior cerebral artery baseline without signs of haemorrhage. Histology of the extracted material

proved the presence of haemostyptic foam used in neurosurgeries. The full arterial flow rate was reached by means of angiography and the clinical condition of the patient was stabilized.

DIAGNOSIS AND MANAGEMENT OF VENOUS THROMBOEMBOLISM (ASH 2018 GUIDELINES)

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Venous thromboembolism (VTE) is the third most common vascular disease. The evidence-based guidelines from the American Society of Hematology (ASH) intend to support patients, clinicians and others in decisions about preventing VTE in these groups. ASH formed a multidisciplinary guideline panel. The panel agreed on 19 recommendations for acutely ill and critically ill medical inpatients, people in long-term care facilities, outpatients with minor injuries and long-distance travelers. Strong recommendations included provision of pharmacological VTE prophylaxis in acutely or critically ill inpatients at acceptable bleeding risk, use of mechanical prophylaxis when bleeding risk is unacceptable, recommendations against the use of direct oral anticoagulants during hospitalization and against extending pharmacological prophylaxis after hospital discharge. Conditional recommendations included not to use VTE prophylaxis routinely in long-term care patients or outpatients with minor VTE risk factors. The panel conditionally recommended use of graduated compression stockings or low-molecular-weight heparin in long-distance travelers only if they are at high risk for VTE. Modern diagnostic strategies for venous thromboembolism (VTE) incorporate pretest probability (PTP) assessment. The ability of diagnostic tests to correctly identify or exclude VTE is influenced by VTE prevalence and test accuracy characteristics. For patients at low (unlikely) VTE risk using D-dimer as the initial test reduces the need for a diagnostic imaging. For patients at high (likely) VTE risk the imaging is warranted. For PE diagnosis ventilation-perfusion scanning and computed tomography pulmonary angiography are the most validated tests, whereas lower or upper extremity DVT diagnosis uses ultrasonography. A research is needed on new diagnostic modalities and to validate clinical decision rules for patients with suspected recurrent VTE. These ASH guidelines assume the choice of anticoagulant has already been made. The panel agreed on 25 recommendations and 2 good practice statements to optimize management of patients receiving anticoagulants.

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ELVES – WHEN? – WHERE? – WHO? – EQUIPMENT? – HOW?

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Endolaser therapy of insufficiency of the superficial venous system of the lower limbs at present demonstrates indubitable effectivity and benefits patients from around the globe. It is, in the vast majority of cases, the first-choice method of therapy. It has been very well tolerated by patients and has also shown long-lasting effects (at present for more than ten years).

According to our preceding experience with classical–stripping–method of radical treatment of varices of the lower limbs, after more than 14 years of experience with ELVeS and more than 1,500 patients, we would like to present our basic knowledge. This includes answers to questions: when? (indication), where? (out-patient x operation theatre), who? (specialization), equipment? (device), how? (method).

We believe that at present it is very important to maintain not only quality, but also extent of the first-time therapy with endolaser ablation of the diseased magistral veins in the whole length and all clusters in the limbs (eventually–in the future–with the possibility of a simultaneous treatment of the intracutaneous spider veins). We believe that the more radical treatment is performed initially (in synergy with complete care of the insufficient superficial venous system), the more lasting effect may be expected.

BRACHIO-FEMORAL PARADOX. SPIRAL FLOW, WALL SHEAR STRESS AND THEIR ROLE IN ATHEROSCLEROSIS

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Peripheral artery disease (PAD) is one of the most prevalent, morbid and mortal diseases worldwide, affecting more than 200 million individuals. Between the years 2000 and 2010, the prevalence of PAD grew at the rate of 13.1% in high-income countries and 28.7% in low- and middle-income countries. Patients with PAD have an increased risk of myocardial infarction, stroke and death, as well as significant quality of life (QOL) impairment. Atherosclerosis is associated with systemic risk factors including among others: hypertension, smoking, hyperlipidemia and diabetes mellitus.

Nonetheless, atherosclerosis remains a geometrically focal disease preferentially affecting the outer edges of vessel bifurcations. In these predisposed areas spiral laminar flow changes in turbulent and haemodynamic wall shear stress. The frictional force acting on the endothelial cell surface as a result of blood flow is weaker. This functional regulation of the

endothelium, by local haemodynamic shear stress provides a model for understanding the typical focal propensity of atherosclerosis in the setting of systemic factors. It may help guide future therapeutic strategies.

Spiral laminar flow is well known as one of the unique qualities of a healthy arterial system in human population.

Brachio-femoral paradox describes and explains an interesting fact, we mentioned previously. This means statistical difference of lower incidence of atherostenosis of brachial artery in comparison with femoral artery. These two vessels can explain that not only well-known risk factors mentioned above are important for atherosclerosis manifestation.

Flow characteristics and parameters seem to play an important role in endothelial dysfunction, which is known as a starting point of atherogenesis. The main reason, why brachial artery does not suffer from atherosclerosis, can be found in its flow parametres, which are completely different in comparison with femoral artery. In brachial artery – the spiral flow is not disturbed. The flow is smooth and has a typical spiral flow shape. Shear stress is high and there are no parts affected with endothelial dysfunction. Even while other risk factors exist, atherosclerosis changes do not appear.

In femoral artery the flow is disturbed and in Hunter's canal is completely turbulent. This is due to aorta-bifurcation, longer distance from the heart and other reasons (AFC-AFS-AFP-bifurcation).

These findings are, at present, accepted in some countries, where the health industry tries to respect the spiral flow principle to create special artificial grafts or stents.

LAPAROSCOPIC VASCULAR RECONSTRUCTIONS: OUR EXPERIENCE

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Since 2003 we have performed 153 fully laparoscopic vascular reconstructions, of which 79 were abdominal aortic surgeries. The mortality of these procedures is 0%, the postoperative morbidity 6%, the frequency of postoperative closures 1.5%, the average time spent in ICU 36 hours and the average hospital stay is 5 days. Other procedures we perform laparoscopically are the laparoscopic lumbal sympatectomy, the thoracoscopic sympatectomy, the laparoscopic treatment of endoleak type II post EVAR and the paraaortal biopsy. Since 2003 we have performed over 600 laparoscopic procedures in our department. The laparoscopic vascular surgery provides all the benefits of a mini-invasive surgery, is more gentle, shortens the time of hospitalization and convalescence, has an excellent cosmetic effect and reduces the final cost of the treatment. The great disadvantage of laparoscopic vascular reconstructions, the protracted vascular clamping, has been reduced. At the same time the practice in laparoscopy is a necessary training in “learning curve” in a robotic vascular surgery.

CAROTID DOLICHOARTERIOPATHIES – ETHIOLOGY, DIAGNOSIS AND THERAPY

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Carotid dolichoarteriopathies (CDA) are classified into three types, specifically tortuous, coiling and kinking (Metz et al. 1961, Weibel et al. 1965) and occur in 25–58% of general population. Kinking is present most often and the internal carotid artery (ICA) is affected most frequently (~94%). According to Metz et al., kinking can be divided into three grades (Grade I–III). CDA are not associated with atherosclerotic risk factors, including hypertension, hypercholesterolemia, diabetes mellitus and cigarette smoking. CDA might occur when the extracranial ICA displays a metaplastic transformation. However, the etiology of the metaplastic transformation remains controversial. Many factors, including embryological maldevelopment and age-related loss of elasticity in the vessel wall, are involved. The histological examination of ICA specimens showed a reduction of elastic fibers and muscular cells with a compensative increase of connective fibers.

It is difficult to correlate the occurrence of CDA with the onset of clinical symptoms. Cerebral haemodynamic changes are mainly associated with the degree of bending of internal carotid artery and can co-occur with a pulsatile cervical mass, pharyngeal foreign body sensation, a pharyngeal bulge covered with intact mucosa and pulsation,odynophagia, pulsatile tinnitus, hemilingular spasm. Cerebrovascular insufficiency can produce dyscirculatory encephalopathy, vertigo, diplopia, transitory ischaemic attacks or infarction. Cerebral symptoms might be caused by DICAs through thromboembolic or haemodynamic mechanisms, particularly when kinking is combined with carotid stenosis.

The diagnostic tool for the assessment of CDA includes Doppler ultrasonography, computed tomography angiography (CTA), magnetic resonance angiography (MRA) and digital subtraction angiography (DSA).

Some CDA should be treated surgically based on certain indications. Despite the success of the surgical reconstruction, an appropriate therapeutic treatment remains a subject of numerous debates due to the lack of multicentric, randomized, prospective studies. Several methods have been developed for the treatment of CDA, end-to-end anastomosis, end-to-side reimplantation, Carotid endarterectomy (CEA) with a patch, eversion CEA with resection of the excess ICA, bypass grafting and carotid angioplasty and stenting. Elimination of the affected segments of the internal carotid artery might prevent progressive cerebrovascular symptoms.

CARDIOVASCULAR TARGET ORGAN DAMAGE IN NEWLY DIAGNOSED ARTERIAL HYPERTENSION

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Hypertension is defined as office systolic blood pressure values ≥ 140 mmHg and/or diastolic blood pressure values ≥ 90 mmHg. Recent studies show that a newly diagnosed arterial hypertension can be associated with subclinical cardiovascular organ damage. Prehypertension is associated with a significantly increased carotid atherosclerotic plaque and it is a primary stratifying risk factor for carotid atherosclerosis, which can cause stroke. Abnormal LV geometry in hypertensive patients is frequently associated with diastolic dysfunction. Left atrial size is also frequently increased in hypertensive patients and is associated with adverse CV events and incident AF, and it is related to diastolic dysfunction. Recent data show that preclinical hypertension significantly affects also LV deformation assessed by 2DE traditional strain and 2DE multilayer strain. Left atrium (LA) strain measurements can also be useful to detect early cardiac alterations in hypertensive patients with preserved LV systolic and diastolic function and these early LA strain alterations can be linked to exertional dyspnea. We enrolled 92 patients subdivided in two groups: 49 patients with a newly diagnosed arterial hypertension and 43 healthy controls. We studied the global and multilayer strain of LV, RV and LA. Our results show that myocardial deformation parameters are impaired in group of cases even if conventional echocardiographic indices such as Ejection Fraction are normal. Then a speckle-tracking echocardiography can be useful in identifying the early impairment of the myocardial function in patients with subclinical hypertension. The use of new imaging techniques could improve risk stratification of these patients.

LARGE HEPATIC ARTERY PSEUDOANEURYSM RESECTION AFTER ORTHOTOPIC LIVER TRANSPLANTATION

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Hepatic artery (HA) pseudoaneurysm (PSA) after a liver transplantation (OLTx) is a rare but often fatal complication requiring a quick repair. Its prevalence in patients after OLTx is around 2%.

A 41-year-old female patient underwent full graft orthotopic liver transplantation (OLTx) for alcoholic liver cirrhosis in 2017. During regular postoperative Dopplers ultrasonography (DU) check-ups a 3-centimetre-large pseudoaneurysm (PSA) was detected on the hepatic artery. The patient underwent a computed angiography (CTA) to verify the PSA anatomical localisation and relation the transplanted liver graft. Based on the CTA, the patient was scheduled for an elective stent graft placement into the hepatic artery PSA in order to avoid a surgical repair. Selective celiac arteriography showed the HA PSA and 90% stenosis of the hepatic artery after the PSA. However, the stent graft placement was unsuccessful as the guiding wire was unable to pass through the post-PSA HA stenosis. The patient was scheduled for an open repair under general anaesthesia. Through a right subcostal incision, the HA PSA was carefully dissected, resected, HA was mobilized and re-anastomosed using an end-to-end technique.

Three months after the procedure, the patient has a good liver graft perfusion through HA with no sign of PSA recurrence or stenosis.

Conclusion: Early hepatic artery PSA after OLTx is a life-threatening complication requiring an immediate treatment. If endovascular treatment options fail, an open surgical repair is despite its challenges the only possible treatment option.

PLETHYSMOGRAPHY AND TELEMEDICINE

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In our paper we attempted to use ten years of experience with the development and practical use of plethysmography devices. We use them to screen both chronic venous insufficiency and ischaemic disease of the lower limbs. After examining more than 2,500 patients, we can compare the sensitivity and specificity of individual methods and their practical contribution in the routine practice of angiological outpatients. In the future we see a very good application of plethysmography methods in telemedicine systems. And that is evidenced by practical experience both within the Czech Republic and practically all over the world.

THE ROLE OF SELF-EXPANDING HYBRID OBLIQUE STENT IN THE TREATMENT OF MAY-THURNER SYNDROME

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In patients with May-Thurner syndrome (common iliac vein compression) an excellent solution appears in the form of a hybrid self-expanding oblique stent "Sinus-Obliquus".

The sinus-Obliquus stent features a proximal closed-cell part, which provides a high radial force at the compression site. The proximal tip of the stent has an oblique (35°) design to protect the contralateral iliac vein inflow. The proximal tip contains 4 radiopaque markers for correct positioning of the stent. The open-cell distal segment affords flexibility and less radial force to better accommodate the curved anatomy of iliac veins.

Indications for the implantation of the sinus-Obliquus stent are: 1) chronic venous insufficiency with non-thrombotic stenosis; 2) residual stenosis after catheter-directed or pharmacomechanical thrombolysis; 3) chronic iliac veins obstruction; 4) significant narrowing of the vena cava inferior and lesion of the common iliac vein and 5) rare indication is lower implanted permanent vena cava filter.

Current experience of small groups represents the primary patency at 6 months 92–98%, the secondary patency 100%. These results also confirm our initial experience.

Wider use of self-expanding hybrid oblique stent was limited due to the higher price, which has been significantly changed. The use of an appropriate stent is very important for the treatment of non-thrombotic or post-thrombotic iliac vein lesion.

LIVING DONOR RENAL TRANSPLANTATION COMBINED WITH ILIAC ARTERY REVASCULARISATION FOR GLUTEAL CLAUDICATION AFTER SUBOPTIMAL EVAR PLACEMENT

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An increase in the number of renal transplant recipients with surgical, endovascular or hybrid repairs of the aortoiliac region is foreseeable due to the advancements of medicine. Decades ago, these complex patients would not be considered as candidates for a renal transplantation.

A 63-year-old male patient with a chronic renal failure (creatinine 476 µmol/l, urea 30 mmol/l, CKD-EPI 0.17 ml/s) due to vascular nephropathy in the solitary left kidney (right kidney was removed for adenocarcinoma 13 years ago) was referred to our centre for pre-renal transplant evaluation. He suffered from bilateral gluteal claudication caused by covering internal iliac arteries with a stentgraft after an endovascular repair of an asymptomatic abdominal aortic aneurysm. He underwent preemptive living donor renal transplant with simultaneous right internal iliac artery revascularisation with saphenous vein bypass graft. Postoperative period was complicated by an impaired graft function due to acute tubular necrosis and non-HLA humoral rejection episode treated with corticosteroids, plasmaphereses and i.v. immunoglobulins. Creatinine at discharge was 209 µmol/l.

Gluteal claudication was resolved. Mesh hernioplasty was performed after 9 months. The remaining left native kidney was removed 3.3 years after the transplant due to duplex renal carcinoma. Tacrolimus immunosuppression was switched to sirolimus. The follow-up is now 5 years with an impaired but satisfactory graft function: creatinine 235 µmol/l, urea 14 mmol/l and CKD-EPI 0.39 ml/s.

Complex aortoiliac lesions requiring treatment are becoming more frequent in patients awaiting renal transplantation. Simultaneous kidney transplant with aorto-iliac revascularisation is feasible especially in planned live donor renal transplantation.

OUR EXPERIENCE WITH PROSTHETIC AV GRAFTS 2016–2018

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Between January 2016 and December 2018, we created 16 prosthetic artificial arteriovenous fistulas for haemodialysis. This type of fistula is performed, when there is no acceptable outflow vein. We used ePTFE (expanded polytetrafluorethylene) Spiral Flow prosthetic grafts.

Because of the specific parameters of the graft, a spiral flow exists at the distal anastomosis. It is necessary to thoroughly examine the venous system, including the central venous system, and giving specific attention to the basilic vein. Our methods of choice are phlebography and ultrasound mapping. Pre-operative nasal and oral cultivations are obligatory too. We created 6 AV fistulas in 2016, 6 AV fistulas in 2017 and 4 AV fistulas in 2018. Percutaneous angioplasty or thrombolysis of the arteriovenous complex was required in 10 patients due to stenosis in various time intervals from surgery. Arteriovenous fistula patency is 93,75%. One of the conduits had to be removed due to infection.

UNPROVOKED CANCER ASSOCIATED VENOUS THROMBOEMBOLISM AS A SIGN OF ADVANCED MALIGNANCY

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Patients with malignant disease have a prothrombotic state due to the ability of tumorous cells to activate the coagulation system by production and release of procoagulant substances and inflammatory cytokines and by their interaction with leucocytes, endothelial and platelet host cells. Similar mechanism can be activated by an anticancer therapy, such as chemotherapy, radiotherapy, hormone therapy or surgery. The wide spectrum of manifestations of the prothrombotic state in cancer ranges from asymptomatic abnormal plasma coagulation tests to massive venous thromboembolism (VTE).

We analysed retrospectively 11 patients (3 females and 8 males). They were hospitalized in our department with VTE occurred as the first manifestation of cancer (4 patients with femoral thrombosis and 7 patients with distal femoral and crural phlebotrombosis) – 3 patients (3 males, 0 females) with an inoperable tumour of the head of pancreas, 8 patients (5 males, 3 females) with advanced colorectal carcinoma. The diagnosis of VTE was done by Duplex ultrasonography (DUS) and Computed tomography (CT) scan, plasma coagulation tests, and a genetic examination.

3 patients (3 males, 0 females) with the inoperable tumour of the head of pancreas underwent only palliative operations with a surviving time up to 3 months. 1 patient with an inoperable sigmoid tumour underwent palliative terminal sigmoidostomy, 7 patients with advanced colorectal carcinoma underwent a colon resection with a creation of anastomosis. Surviving time was from 6 weeks to 3 years.

Unprovoked VTE can be the first sign of a malignant disease. After the exclusion of inherited thrombophilia by haematologic examination, an intensive examination of patients can identify advanced cancer as the source of VTE.

DUPLICATION OF THE SUPERFICIAL FEMORAL VEIN: INCIDENCE AND POTENTIAL SIGNIFICANCE

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The purpose of this study was to determine the prevalence of the superficial femoral vein (SFV) duplication.

156 patients underwent a bilateral lower limb ultrasound examination.

The diameter of one SFV is in 99% cases higher than the diameter of the femoral artery. The incidence of the femoral vein duplication in the middle part of the thigh was 27%. Duplications were bilateral in 27 patients and unilateral in 31 patients. The average diameter of one femoral vein was 0.85 cm, in patients with duplication it was 0.74 and 0.4 cm.

Conclusion: Superficial femoral vein duplication is a common variant. This knowledge may help reduce false negative examination for venous thrombosis.

COULD MECHANICAL THROMBECTOMY REPLACE THROMBOLYSIS IN THE TREATMENT OF ACUTE AND SUBACUTE LIMB ISCHAEMIA?

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Acute limb ischaemia is a vascular emergency defined as a sudden decrease in limb perfusion associated with a risk of loss of

viability of the affected extremity. Surgical treatment (Fogarty thromboembolectomy) is indicated only in suprainguinal occlusions. Other cases of acute and subacute limb ischaemia should be managed percutaneously. Catheter-based treatment involves local thrombolysis and percutaneous mechanical thrombectomy (PMT). There are several devices in use for PMT; of which the Rotarex system appears to be the most useful. There are no randomized studies comparing thrombolysis and PMT. Only an indirect comparison is possible. The immediate and long-term results of PMT using the Rotarex device are probably more favourable than those, following thrombolysis. Particularly for older and polymorbid patients it may be significant, that PMT in comparison with thrombolysis can restore blood flow faster and in one session, no contraindications for PMT in contrast to potentially life-threatening complications in thrombolysis exist and there is also no need for observation in intensive care unit after PMT. Hospital stay after PMT is shorter. There is only one exception when thrombolysis cannot be replaced by Rotarex PMT—in the case of the crural arteries involvement—due to the catheter size. Some own experiences with mechanical thrombectomy using the Rotarex catheter and with thrombolysis are presented.

In our opinion, PMT is superior to thrombolysis in the treatment of acute and subacute limb ischaemia. Thrombolysis should be considered only in special cases, e.g. in crural arteries occlusions or in the case of a failure of mechanical thrombectomy.

COMPARISON OF ENDOVASCULAR RECANALISATION VERSUS OPEN BYPASS SURGERY FOR INFRA-INGUINAL TRANS-ATLANTIC INTER-SOCIETY CONSENSUS (TASC)–D ARTERIAL LESIONS – A RETROSPECTIVE COMPARATIVE STUDY

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Introduction: Endovascular recanalisation has been increasingly considered for the treatment of long infra-inguinal arterial lesions (TASC-D lesions). The aim of this study was to compare endovascular recanalisation with open bypass surgery for infra-inguinal TASC-D arterial lesions.

Methods: Retrospective data was collected from patients who underwent the endovascular recanalisation from January 2016 to April 2017 and the infra-inguinal bypass surgery between January 2011 and August 2015. Primary outcome measures were 30-day mortality, 30-day patency and 30-day amputation rates. Secondary outcome measures included long term patency and reintervention rates.

116 patients had the bypass surgery and 55 had the endovascular recanalisation (171 cases in total).

Results and conclusion: The bypass surgery had a significantly higher 30-day patency rate in comparison to the endovascular recanalisation. 30-day amputation rates were again significantly better for the bypass surgery as compared to the endovascular. Late amputation rates were also higher for patients who had the bypass (12.5% vs 4.1%) but statistically not significant ($p=0.100$). There was no significant difference for re-intervention rates between these two groups. Mean ASA score for patients having the bypass was 2.8 as compared to 2.6 for the endovascular ($p=0.038$). 30 day patency: Open vs. Endo: 82.3% vs. 58.2% ($p<0.001$); 30 day amputation: Open vs. Endo: 0.9% vs. 12.7% ($p<0.001$); 30 day mortality: Open vs. Endo: 6% vs. 7.3% ($p=0.758$); Late Patency: Open vs Endo (Median days): 277 (IQR 106–642) vs. 90 (IQR 29–180) $p<0.001$.

Short and long term patency and short term amputation rates are better for the bypass surgery as compared to endovascular recanalisation for the treatment of infra-inguinal TASC-D lesions based on our collected data.

VASCULAR MALFORMATION IN THE CATCHMENT AREA OF ARTERIA MESENTERICA SUPERIOR AS AN UNUSUAL CAUSE OF RECURRENT BLEEDING INTO THE DIGESTIVE TRACT – A CASE REPORT

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Gastrointestinal bleeding is a common problem encountered by internists and surgeons in daily practice. The source of haemorrhage can usually be detected during endoscopic examination (gastroscopy or colonoscopy). Sometimes, however, the reason of it is not clear from a standard examination or can be confused with another illness. Then further detailed examinations are necessary.

Authors present a case of a 78-year-old woman with recurrent bleeding into the gastrointestinal tract manifested by haematemesis and melena, requiring repeated blood transfusions. The gastroscopic examination revealed severe haemorrhagic gastropathy, which was initially evaluated as congestive gastropathy in portal hypertension. However, a subsequent detailed examination excluded portal hypertension and, as a cause of haemorrhage, an extensive vascular malformation in the catchment of the upper mesenteric artery with numerous connectors in the portal vein was found in CT angiography. Because of the risk of a surgery in this patient, the selective embolisation of pancreatic arcades was chosen as the first-choice method. Due to an insufficient effect and continued anaemisation, the embolisation of the right gastric artery was thereafter supplemented with good angiographic effect.

After the procedure the patient was in good condition with no signs of ongoing bleeding. She is currently in the care of the internal department in the place of residence. Further development of her health condition will also be a subject of our interest.

ANGIOLOGY IN THE CONTEXT OF 100 YEARS OF THE CZECHO-SLOVAK COOPERATION AND UNIVERSITY EDUCATION

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On the 27th June 1919 members of the National Assembly of the Czechoslovak Republic approved the Act no. 375/1919, which established the Czechoslovak State University in Bratislava. Teaching language was Slovak and Czech. In November 1919 the university was renamed after the world-known teacher Jan Amos Komenský to Comenius University (CU). The founder and the first faculty was the Faculty of Medicine. It was created by a team of professors who had previously worked at Charles University in Prague. The first Rector of the Comenius University was Prof. Kristian Hynek and the first Dean of the Faculty of Medicine was Prof. Gustav Müller. In 1919 the Faculty of Medicine consisted of seven clinics: Department of Surgery (head Prof. Stanislav Kostlivý), Department of Internal Medicine (head Prof. Kristian Hynek), Department of Obstetrics and Gynaecology (head Prof. Gustav Müller), Department of Ophthalmology (head Prof. Roman Kadlický), Department of Paediatric Medicine (head Prof. Jiri Brdlik), Department of Neurology and Mental Diseases (head Prof. Zdenek Myslivecek) and Department of Stomatology (head Assoc. Prof. Adolf Mach). The first lecture was held on the 9th December 1919. For the first three academic years the Faculty of Medicine was opened only for clinical studies (3rd–5th year of study), where students after graduating the theoretical classes in Prague, Budapest or Cluj were enrolled.

The founder of the Czecho-Slovak angiology is Prof. MUDr. Bohumil Prusík, DrSc., the first citizen of the Czechoslovak Republic, who was proposed for Nobel Prize. At the 4th Clinic of Internal Medicine in Prague, headed by Prof. Prusík, the first Czecho-Slovak angiology “school” was founded. First Slovak angiologists–MUDr. Matej Ondrejčák and MUDr. Juraj Madar–were working there too. The Slovak Angiological Society of the Slovak Medical Association (S.A.S. SMA) came into being in the year 1993. In the same year the first Slovak Angiological Congress was held in Tatranske Zruby. Altogether 51 presentations (among them 12 from the Czech Republic, and one from Switzerland) were presented at this first congress. It was the start of an active cooperation between Czech and Slovak vascular specialists.

REGRESSION OF THE HAEMODYNAMICALLY SIGNIFICANT STENOSIS OF THE LEFT INTERNAL CAROTID ARTERY 6 MONTHS AFTER IMPLANTATION OF THE TOTAL ARTIFICIAL HEART

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Introduction: Management of asymptomatic stenosis of carotid arteries is one of the most controversial topics in vascular medicine. In most of patients a conservative approach is recommended. Here we describe an interesting case of the course of asymptomatic carotid stenosis in a patient with a bioprosthetic artificial heart.

Presentation of the case: A 57-year-old man with an advanced heart failure due to ischemic cardiomyopathy and the bioprosthetic artificial heart was diagnosed with borderline significant stenosis of the left internal carotid artery (60–70%) established by an ultrasound shortly after the implantation. Because the patient was asymptomatic from this territory, decision was a conservative approach with an aggressive control of cardiovascular risk factors and repeated examination in 6 months. Surprisingly, the repeated examination 6 months later revealed a substantial regression of the stenosis to 30%. Incidentally, both examinations were performed by two independent sonographers.

Conclusion: This case report supports a cautious and rather conservative approach in the management of asymptomatic carotid stenosis. Whether the mechanical devices supporting heart function, including an artificial heart, can also contribute to the phenomenon of a spontaneous regression of carotid stenosis should be established in future studies.

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NURSING CARE FOR A PATIENT WITH DEEP VENOUS THROMBOSIS

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The issue of venous thrombosis and its consequences has currently a very high occurrence and does not only affect older people, it can also affect young people. Therefore, life-threatening blood clots do not only arise with age, but also with long-term sitting or standing and when the body is exposed to an unnatural dull position for a long time. The most common are the deep veins of the lower limbs, the thighs and the calves. The neck or vein of the chest may also be affected.

In young people with severe thrombosis and at risk of pulmonary embolism or thrombus the limited blood circulation

in the limb is treated with fibrinolytics. In this method the fibrinolytic is administered via a catheter inserted into the vein either under the thrombus or directly into its area.

The aim of the thesis is to point out the specifics of a nursing care of a patient with deep venous thrombosis in the continuous administration of fibrinolytics.

TREATMENT OPTIONS OF THE INFECTED VASCULAR PROSTHETIC GRAFT. OUR EXPERIENCES WITH BIOINTEGRAL BIOPROSTHESES

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Infection treatment of the prosthetic graft can be often challenging, especially in the aortofemoral region. These patients are in a bad condition. Their organism is exhausted by chronic sepsis status. They are at risk of life due to this complication. One of the main issues is the choice of a suitable replacement material for the infected graft. An ideal option is the use of an autologous vein graft. We also have an experience with the usage of fresh and cryopreserved homografts. Last year we had an opportunity to use the newly available Biointegral vascular graft. This specially modified xenotransplant is manufactured from a bovine pericard. No-React treatment of the surface allows fast endothelialisation and hence greater resistance to infection. We used this type of xenograft in 10 patients. In 8 cases it was implanted intracavally. In 2 cases the graft was implanted in the infrainguinal region. In our set of patients 2 early and one late death occurred. None of which was related to the failure of the xenograft. In 3 patients a reintervention was necessary due to an infection of the xenograft.

Conclusion: According to our first experience with the use of this new xenograft, it offers an interesting choice in the treatment of the infected vascular grafts.

LIPOEDEMA, PRINCIPLES OF A COMPLEX THERAPY

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Lipoedema was first described by Allen and Hines of the Mayo Clinic in 1940 as a fatty leg syndrome with orthostatic oedema. Despite the fact that this syndrome has been known for over 75 years, it is permanently ill-diagnosed and treated. Lipoedema is defined as a chronic, progressive and often severely painful disease of subcutaneous adipose tissue with symptoms of a lymphatic insufficiency. It occurs predominantly in women, characterized by a symmetrical increase in adipose tissue in the area from the waist through the buttocks

and the lower limbs with a typical tip at the ankles. It is predominantly a non-pitting oedema that progresses with weight gain, cyclically aggravated by heat and static strain in the form of long standing or sitting. In a number of cases, the upper one is also affected.

Its cause is multifactorial, when the microcirculation disorder in interstitium is mainly due to mechanical pressure of lymphatic vessels of fat tissue.

Subcutaneous fat in lipoedema is hard to reduce by a regular exercise or diet. A suitable treatment regimen is a modified form of CDT, which is focused on promoting interstitial microcirculation. First, there is an adjustment of the diet regimen, followed by exercises focused on activating the venous muscle pump, lymph drainage support and compression treatment. Both manual and machine lymphatic drainage bring relief. Invasive or semi-invasive procedures aimed at destroying fatty tissue are an integral part of the complex therapy. Lipoedema is often misdiagnosed as lymphoedema or simple lipohypertrophy. The characteristic feature of lipoedema is that under the normal reduction regimen there is a reduction in the volume of adipose tissue but mainly outside of the problematic areas of the lower limbs. In the prevention and treatment of lipoedema a multidisciplinary cooperation with practitioners, gynecologists, angiologists, obesitologists etc. is necessary. For lipoedema, as well as obesity, the basic principle is: prevention is the most effective treatment.

THE CONTRIBUTION OF ULTRASONOGRAPHY, PHOTOPLETHYSMOGRAPHY AND LASER DOPPLER FLOWMETRY IN THE EXAMINATION OF RAYNAUD'S PHENOMENON

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We would like to present a comparison of three methods important in evaluation of microcirculation disorders.

Our group of patients consists of 20 persons diagnosed with Raynaud's phenomenon (RP). We compared the classical procedure of a cold stress test with Photoplethysmography (PPG) to various cold stress tests with Laser Doppler Flowmetry (LDF). Short and intensive cold test (one minute/ice cubes) is generally better tolerated compared to longer cooling (10 min/10 °C).

Results: Mere cold stress LDF is less sensitive than cold stress PPG.

We proved that the protocol cold stress with an additional rewarming test (up to elbows 10 min/40 °C) using LDF is significantly more sensitive and accurate in differential diagnostics of Raynaud's phenomenon.

The above methods are considered as fast, reliable and cost effective.

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