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mit Workshop der Vereinigung der Primärärzte und
ärztlichen Direktoren des Landes Steiermark

in Zusammenarbeit mit der
Österreichischen Gesellschaft für Internistische Angiologie
der
Österreichischen Gesellschaft für Laboratoriumsmedizin und
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und der
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Akzeptierte Abstracts in alphabetischer Reihenfolge nach Erstautoren

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Derived Neutrophil-to-Lymphocyte Ratio and its Association with Critical Limb Ischemia in PAOD Patients

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Background Levels of neutrophils and leukocytes are important laboratory parameters reflecting systemic inflammatory response in patients with atherosclerotic diseases such as peripheral arterial occlusive disease (PAOD). The Neutrophil-to-Lymphocyte Ratio (NLR) has been shown to be associated with a higher risk of critical limb ischemia (CLI) in those patients. By means of neutrophils and leukocytes, which can be measured inexpensively and routinely, the derived Neutrophil-to-Lymphocyte Ratio (dNLR) can be calculated even more easily. We therefore investigated a possible association of CLI in PAOD patients and levels of dNLR.

Methods We performed a retrospective data analysis including 1995 patients with PAOD treated at our department in the years 2005 to 2010. Based on white blood cell count dNLR was calculated. According to the level of dNLR the cohort was divided into tertiles. Classification of PAOD was made by using Fontaine stages and CLI was defined as PAOD with ischemic rest pain and/or skin ulceration/gangrene. Statistical analyses were performed using SPSS 20.0.

Results In our data analysis higher levels of dNLR were associated with an increased CLI rate. In the first tertile with lowest dNLR (median dNLR 1.33, 1.06–1.56) the CLI rate was 20.4%, in the second tertile (median dNLR 2.19, 1.96–2.50) the CLI rate was 26.1%, and in the third tertile (median dNLR 4.22, 3.37–6.40) the CLI rate was 36.1%. Statistical significance was shown by using a Jonckheere-Terpstra test ($p < 0.001$).

Conclusion The dNLR might be a useful parameter in risk stratification of PAOD with prognostic value especially to highlight patients at increased risk for CLI.

Lymphocyte-to-Monocyte Ratio: A Novel Marker for Critical Limb Ischemia in PAOD Patients

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Objective The Lymphocyte-to-Monocyte Ratio (LMR) is an easy to measure parameter from the white blood cell count and was published for patients suffering from malignant hematologic disorders as a marker for poor survival. Lymphocytes and monocytes both play a certain role in the progression of atherosclerosis. We therefore investigated LMR and its association with critical limb ischemia (CLI) in peripheral arterial occlusive disease (PAOD) patients.

Methods We evaluated 2121 PAOD patients treated at our institution from 2005 to 2010. LMR was calculated and the cohort was divided into tertiles according to the LMR. An optimal cut-off value for the continuous LMR was calculated by applying a receiver operating curve analysis to discriminate between CLI and non-CLI.

Results In our cohort occurrence of CLI significantly decreased with an increase in LMR. As an optimal cut-off a LMR of 3.1 was identified. Two groups were categorized, one containing 1021 patients (LMR < 3.1) and a second group with 1100 patients (LMR ≥ 3.1). CLI was more frequent in LMR < 3.1 patients (427 [41.8%]) compared to LMR ≥ 3.1 patients (254 [23.1%]; $p < 0.001$), as were prior myocardial infarction (60 [9.5%] vs. 35 [3.2%]; $p = 0.003$) and congestive heart failure (136 [13.3%] vs. 66 [6.0%]; $p < 0.001$). A LMR < 3.1 was associated with an OR of 2.0 (95%-CI: 1.8–2.2; $p < 0.001$) for CLI even after adjustment for other vascular risk factors.

Conclusion A decreased LMR is significantly associated with a high risk for CLI and other vascular endpoints. The LMR is an easily determinable, broadly available and cheap marker which could be used to highlight patients at high risk for vascular endpoints.

Acute “Wiiitis” Representing as Thrombosis of the Inferior Vena cava and Left Pelvic Veins

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Deep venous thrombosis (DVT) as a result of venous wall injury provoked by trauma is no uncommon finding. It often occurs in patients with sportive over straining, caused by over fatigue of the body structures.

In 2007 the entity of acute “wiiitis” was first described in a letter to the *New England Journal of Medicine*. Acute “wiiitis” sums up all affections, mainly skeletal and muscle affections, provoked by playing this video-game system.

DVT as a consequence of Nintendo Wii has not been described so far.

We present a patient with a massive free floating thrombus of the left pelvic veins originating from the gluteal veins and reaching into the inferior vena cava after a hard fall when playing Nintendo Wii.

Lumbar Artery Aneurysms as a Rare Case of Life Threatening Retroperitoneal Bleeding – Case Report and Literature Review

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Pseudoaneurysm of the lumbar artery is a rare case of retroperitoneal bleeding and mostly associated with penetrating trauma.

We present the case of an 83 year old female, presenting with a life threatening retroperitoneal bleeding due to spontaneous ruptured lumbar aneurysms. Two days before, angiography of the lower limb arteries, followed by plain old balloon angioplasty of the left popliteal artery in cross over technique with concomitant anticoagulant treatment had been performed. Due to subsequent fall of hemoglobin levels, decreasing blood pressure and increasing pain in the lower right abdomen an abdominal CT scan was performed which revealed active retroperitoneal bleeding. On angiography 3 small lumbar aneurysms could be detected as bleeding source. Transcatheter embolization was performed successfully.

Differentiation of Superficial Femoral Artery Restenosis by Optical Coherence Tomography (OCT)

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Background A thorough and more sophisticated evaluation of the nature of restenoses is established in the coronary field with different diagnostic modalities like optical coherence tomography (OCT), which gives further insight into the vessel wall and the respective morphology of the target lesion. In the peripheral field none of these diagnostic techniques have achieved the status of common practice. We tried to evaluate the morphological nature of first time reobstructions in the superficial femoral artery (SFA) as a consequence of their initial treatment with plain old balloon angioplasty (POBA) versus primary stenting by OCT.

Methods We conducted a single-center non-randomized observational study to evaluate 10 consecutive patients who showed up with symptomatic reobstructions after endovascular treatment of the SFA. To guarantee a homogenous nature of reobstruction, we included only patients with a first time high-grade reobstruction of the SFA. These stenoses had to be easily passed with a guiding catheter, so that one could assume that also the OCT probe could be forwarded without any problems.

The 10 patients were divided into two groups according to their initial treatment, namely POBA or bare metal stent placement.

Results 10 consecutive patients with a mean age of 75.7 ± 4.5 years were evaluated. The mean lesion length was 9.7 ± 3.6 cm and the mean time span since primary treatment 8.6 ± 3.7 months.

Concerning the modality of reobstruction in relationship to the primarily applied endovascular technique we identified in the POBA group the classic atherosclerotic plaques with mixed features of lipid pool areas, calcium deposits, calcified plaques, necrotic areas and fibrosis.

In contrast, we were able to show massive neointimal hyperplasia with purely fibrotic features in all cases of in-stent restenotic (ISR) lesions with considerable neovascularization in one of them.

Discussion Our data show for the first time a clear morphological difference of reobstructions in the SFA depending on the primary treatment. We were able to show a clear relationship of the primary endovascular treatment (either POBA or bare metal stent placement) with the morphology of reobstruction.

Stenting of the Popliteal Artery – A Single Center Experience with 5 year Follow up

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Background Popliteal artery morphology is changing while undergoing knee motion. Therefore stenting of the popliteal arterial segment (PA) in patients with peripheral arterial occlusive disease is a controversial matter, because for the fear of stent fractures due to knee motion and consecutive higher risk of reobstructions. We want to present our data of a consecutive cohort of patients with popliteal artery stenting with a maximum follow up of 5 years

Materials and Methods From 2006 to 2009 we included patients with peripheral arterial disease Rutherford Stage 2–6 and popliteal arterial obstructions into a consecutive registry. In all patients we performed an endovascular reopening procedure of the popliteal artery and in case of an unsatisfactory result (flowlimiting dissection or restenosis of $> 50\%$) secondary bailout stenting. Concomitant inflow and outflow treatment was allowed in the same session, stenting was only performed if the inflow and outflow lesion treatment was successfully with a restenosis $< 30\%$. All at the time commercially available stents were used.

All patients were followed up at month 6, 12, 24, 36, 48 and 60 by clinical assessment, laboratory assessment, ankle brachial index, duplex ultrasound and x-ray of the implanted stents. In case of clinical deterioration an angiography was performed with the purpose of reintervention.

Results 105 patients with a mean age $73.11 (\pm 10.03)$ yrs were included into the registry. In 36 patients (34.3%) plain old balloon angioplasty and in 69 patients (65.7%) stenting of the PA was performed. In 62 patients 1 stent, in 6 patients 2 and in 1 patient 3 stents were placed in the PA segment. Concomitant inflow treatment was performed in 64 (61%) and outflow treatment was performed in 39 (37.1%) patients. At least 1 run off vessel to the ankle was evident in 64 patients (61%).

At month 6, 24 (22.9%) patients showed up with a restenosis $> 50\%$ of the PA target lesion (TL). 7 (19.4%) patients with POBA treatment showed a $> 50\%$ restenosis, and 17 (24.6%) stented patients. 4 stent fractures were detected at month 6, only 1 in a patient with a restenosis $> 50\%$. 7 reinterventions due to clinical deterioration had to be performed, 5 in the stent and 2 in the POBA group. At month 12 an additional 6 patients showed restenosis $> 50\%$ (5 stented patients), with the need for reintervention in 1 patient. 2 additional stent fractures were detected at month 12, but none was related to a significant restenosis. At month 24 5 patients showed a new restenosis $> 50\%$, 1 POBA, 4 stented patients, 1 with a preexisting stent fracture since month 6. There was no need for reintervention. At month 36, 4 patients presented with new restenosis $> 50\%$, 3 stented patients. In 1 patient a clinically driven reintervention was performed, no additional stent fracture had occurred. At months 48 and months 60 no new restenosis, stent fracture or clinically driven reintervention had occurred. A total number of 39 (37.1%)

reobstructions > 50% of the PA TL occurred within the FU period, with the need of 9 clinically driven reinterventions (8.6%). 6 stent fractures (8.7%) have occurred within the FU period, only 1 lead to a reintervention.

Conclusion The PA segment in our cohort shows a high rate of re-obstructions after endovascular treatment with a considerable rate of clinically driven reinterventions. Although stent implantation of the PA segment was related to a higher number of reobstructions > 50%, this did not end up in a higher number of clinically driven reinterventions. Our data also suggest that stent fractures do not seem to play a role in PA reobstructions and seem not to be responsible for clinically driven reinterventions.

Aortic Aneurysm related to CGA – An Overestimated Risk?

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Background Giant cell arteritis (GCA) is an autoimmune disorder affecting medium- and large sized arteries. The most common symptoms are related to ischemic cranial involvement. Nevertheless, asymptomatic aortic involvement may cause aneurysm and dissections. Several studies in this issue had limitations regarding imaging methods and matched control groups.

Objectives To evaluate aortic diameters in a cohort of GCA patients and a matched control group by CT-angiography (CTA) as a uniform imaging method. Furthermore, to detect the prevalence of aortic aneurysms, defined as an aortic diameter > 50 mm or local widening > 50%, and a body surface area (BSA) adjusted aortic diameter above the 95th percentile.

Methods All patients with diagnosed GCA at least two years prior to enrolment underwent CTA of the thoracic and abdominal aorta. Patients without a rheumatic disease, who underwent thoracic and abdominal CT for other reasons (i.e. infection, cancer) participated in the age matched control group. A quotient of aortic diameters and BSA was calculated. The study was approved by the local ethics committee, written informed consent was obtained.

Results 128 Patients with GCA (99 female) and 111 subjects of the control group were included. Mean age of GCA patients was 74.0 ± 7.8 years, included 73 ± 117 months after GCA diagnosis. Mean thoracic aortic diameters [values/m² BSA] were 34.66 ± 4.59 mm [19.89 ± 3.02 mm/m²], 28.20 ± 3.50 mm [16.17 ± 2.30 mm/m² BSA] and 25.83 ± 3.17 mm [14.82 ± 2.21 mm/m² BSA] at the ascending aorta (AAT), the aortic arch (ART) and the descending aorta (DAT) respectively. The AAT diameter did not differ between GCA and control group subjects with a mean value of 34.42 ± 4.31 mm [19.58 ± 2.80 mm/m² BSA; p = 0.411]. The mean diameters of the ART and the DAT differed significantly compared to GCA patients with values of 27.33 ± 2.86 mm [15.56 ± 2.12 mm/m² BSA, p = 0.036] and 24.77 ± 2.70 mm [14.09 ± 1.83 mm/m² BSA; p = 0.006]. Aortic aneurysms, defined as aortic diameter > 50 mm were present in 1 patient of the GCA group (0.8%) and 1 in the control group (0.9%, n. s.). Five patients of the GCA group (3.9%) and 6 control group subjects (5.4%; p = 0.759) had a BSA adjusted diameter of the DAT above the 95th percentile as proposed by Kälsch et al. We did not observe any aortic dissection or an aneurysm of the abdominal aorta. Mean abdominal aortic diameter did not differ between GCA and control group subjects with values of 21.0 ± 2.5 mm and 21.0 ± 2.3 mm respectively (p = 1.00).

Conclusions Vigilance and screening for aortic aneurysms is considered in GCA patients; however, our data of a uniform vascular imaging in GCA patients and an age matched control group suggest that the risk developing aortic aneurysms after GCA diagnosis might be overestimated. Uniform imaging methods and adjustment for BSA would be essential when considering aortic studies in GCA.

Cutaneous Plasmacytoma – a Rare Case

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A 67 year old woman with a 5 year history of idiopathic thrombosis in the right internal jugular vein presented at our department with progressive skin lesions in her face, progressive thrombosis in the right internal jugular vein, and a newly found thrombosis in the left internal jugular vein despite sufficient oral anticoagulation.

Monoclonal gammopathy of undetermined significance IgG Lambda was diagnosed 3 months prior to admission. Bone marrow biopsy showed no pathological findings. Physical examination revealed massive vein convolutes spread from head over neck to the chest. Magnetic resonance venography showed massive soft tissue expansion in the face with low contrast enhancement infiltrating the wall of superior caval vein and reaching the right atrium in form of a cone.

Upon this structure appositional thrombus formation was found. Punch biopsy samples taken from maculous skin lesions in the face showed vascular malformation without evidence for malignoma.

To get more representative specimen deep biopsy was done. Histology showed an extraosseous cutaneous plasmacytoma. Chemotherapy with dexamethason, doxorubicin and bortezomib was scheduled. Before specific treatment was started the patient died of acute heart failure. Autopsy showed no evidence of acute pulmonary embolism.

Risk Factors for Puncture Site Complications after Endovascular Procedures in Peripheral Arterial Disease Patients

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Purpose To compare vascular closure devices with manual compression with regard to puncture site complications in patients after endovascular procedures for treatment of peripheral arterial occlusive disease. Furthermore we wanted to highlight risk factors for occurrence of complications at vascular access site.

Methods This retrospective data analysis included 787 patients (63.4% men; median age 72 years) who had undergone a peripheral endovascular procedure of the lower extremities from January to December 2011. All procedures were performed according to a standardized protocol. As an end point puncture site complications were documented.

Results The incidence of access site complications was not significantly different between the closure device group and the manual compression group (p = 0.08). 90 puncture site complications (11.5%) were registered: 22 pseudoaneurysms (2.8%), 59 hematomas (7.5%), 6 bleeding events (0.8%), 2 dissections (0.3%) and 1 arteriovenous fistula (0.1%). In patients with puncture site complications age was significantly higher (74 vs 71 years; p = 0.02) and body mass index significantly lower (26 vs 27 kg/m²; p = 0.01) compared to patients without access site complications. Procedure duration was significantly longer in patients with access site bleedings (60 vs 39 min; p = 0.01). Below the knee procedures (p = 0.002) and lower prothrombin time (78% vs 85%; p = 0.03) were risk factors for pseudoaneurysms in our analysis. Blood pressure > 200 mmHg during the procedure was significantly associated with access site complications (p = 0.003) and puncture site hematomas (p = 0.001).

Conclusion From our data we conclude that higher age, increased procedure duration, below the knee procedures, lower body mass index, high blood pressure, and decreased coagulation levels are risk factors for occurrence of access site complications.

Regulatorische T-Zellen in der Nephrokalzinose und dystrophen kardialen Kalzinose der DBA/2-Maus

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Hintergrund Nephrokalzinose bezeichnet das ektope Auftreten von Kalziumablagerungen in den Nieren und tritt unter anderem i. R. von Phosphatnephropathie, primärem Hyperparathyreoidismus und renaler tubulärer Azidose auf. Die vorliegende Arbeit beschäftigt sich mit dem Einfluss regulatorischer T-Lymphozyten (Tregs) auf ektope Verkalkungsprozesse im Mausmodell der verkalkungsanfälligen DBA/2-Maus.

Methode Weibliche DBA/2-Mäuse wurden entweder mittels eines gegen CD3 gerichteten Antikörpers T-Zell depletiert (n = 10) oder mittels eines gegen CD25 gerichteten Antikörpers Treg-depletiert (n = 15) und jeweils mit einer Isotyp-behandelten Gruppe (n = 9,

n = 15) verglichen. Anschließend wurden diese Mäuse für 9 Tage auf eine Hoch-Phosphat-Nahrung (HPN) gesetzt und das Ausmaß der ektope Verkalkungen mittels micro-CT quantifiziert.

Ergebnisse Die HPN-Gabe rief einen eindeutigen Phänotyp einer Nephrokalzinose und dystrophen kardialen Kalzinose hervor. T-Zell-Depletion vermehrte das Ausmaß der renalen Verkalkung signifikant (p = 0,022). Dazu passend erhöhte auch die Treg-Depletion die Ausprägung der Nephrokalzinose (p = 0,039) und ging darüber hinaus mit signifikant erhöhter Mortalität einher (p = 0,004). Die jeweilige Immunomodulation hatte keinen Einfluss auf die kardiale Verkalkung. Semi-quantitative histologische Auswertungen des Verkalkungsgrades mit Alizarin-Rotfärbung bestätigten die radiologischen Messungen. Präliminäre Auswertungen zeigen zudem, dass die HPN in diesem Tiermodell auch einen ausgeprägten vaskulären Phänotyp induziert, der einer urämischen Mediasklerose entspricht.

Konklusion Zusammenfassend zeigen unsere Daten eine regulatorische Rolle von T-Lymphozyten im Fortschreiten der Nephrokalzinose auf und illustrieren die pathophysiologische Bedeutung von Inflammation in Verkalkungsprozessen.

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