JAGIELLONIAN UNIVERSITY
MEDICAL COLLEGE
IN KRAKÓW

STUDENCKIE TOWARZYSTWO NAUKOWE
UNIWERSYTET JAGIELLOŃSKI
COLLEGIUM MEDICUM
KRAKÓW

INTERNATIONAL MEDICAL
IMSC
STUDENTS' CONFERENCE

30th edition of

INTERNATIONAL MEDICAL STUDENTS' CONFERENCE

June 1st–4th 2022

BOOK OF ABSTRACTS

WELCOME LETTER

Dear Colleagues,

On behalf of the Board of the Students' Scientific Society of the Jagiellonian University Medical College in Cracow, we welcome all of you to the special 30th edition of the International Scientific Conference organized by the Students' Scientific Society on June 1st – 4th, 2022. We are glad and honored that the Conference is back live to its heart in the historic place of Polish Kings, the city of Cracow with one of the oldest universities in Europe – Jagiellonian University. We are all fully aware that through the last few years the COVID-19 pandemic has affected many aspects of our lives. The reduction of restrictions and a breath from the difficulties associated with the pandemic convinced us to do our best to provide all with the possibility of direct networking on this year's on-site IMSC. Unfortunately, the world shook again with the war in the East. We are entirely opposed to the military action undertaken by Russia for the brutal attack on Ukraine. We believe that Ukrainian students will find an opportunity for personal and scientific development in these hostile times. Therefore, we decided that all Ukraine students could participate in the 30th IMSC free of charge. We appreciate that despite these obstacles, all students attending this on-site conference, understand why they want to attend this event, which most likely has to do with presenting and learning about basic and clinical research and developing skills and contacts in the scientific world. Consequently, the scientific sessions at the meeting are devoted to the present the diverse and evolving modalities in diagnostics, methodologies, and technologies in experimental and clinical medicine.

We want to thank you for attending our event and presenting the results of your research. Your vision and knowledge will pave the way for the future. Each year you are a true inspiration for us. We hope that the jubilee 30th edition of IMSC will contribute to your future scientific career and that you will remember well these days spent in Cracow. Naturally, we also hope to see you next year at the 31st IMSC.

Krakow, June 1st, 2022

Jerzy Skuciński & Maciej Frączek

Leaders of Organizing Committees of 29th and 30th IMSC
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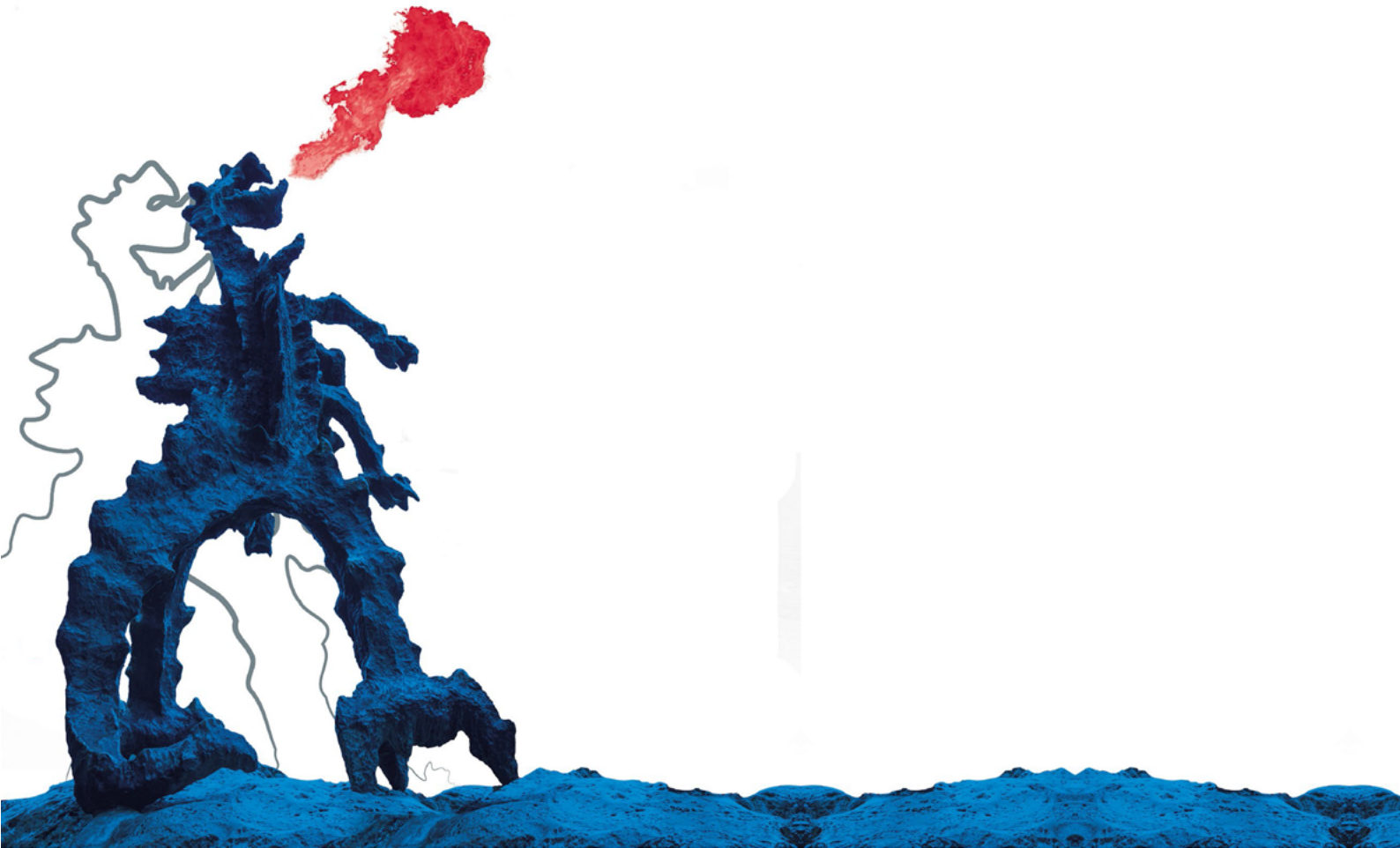

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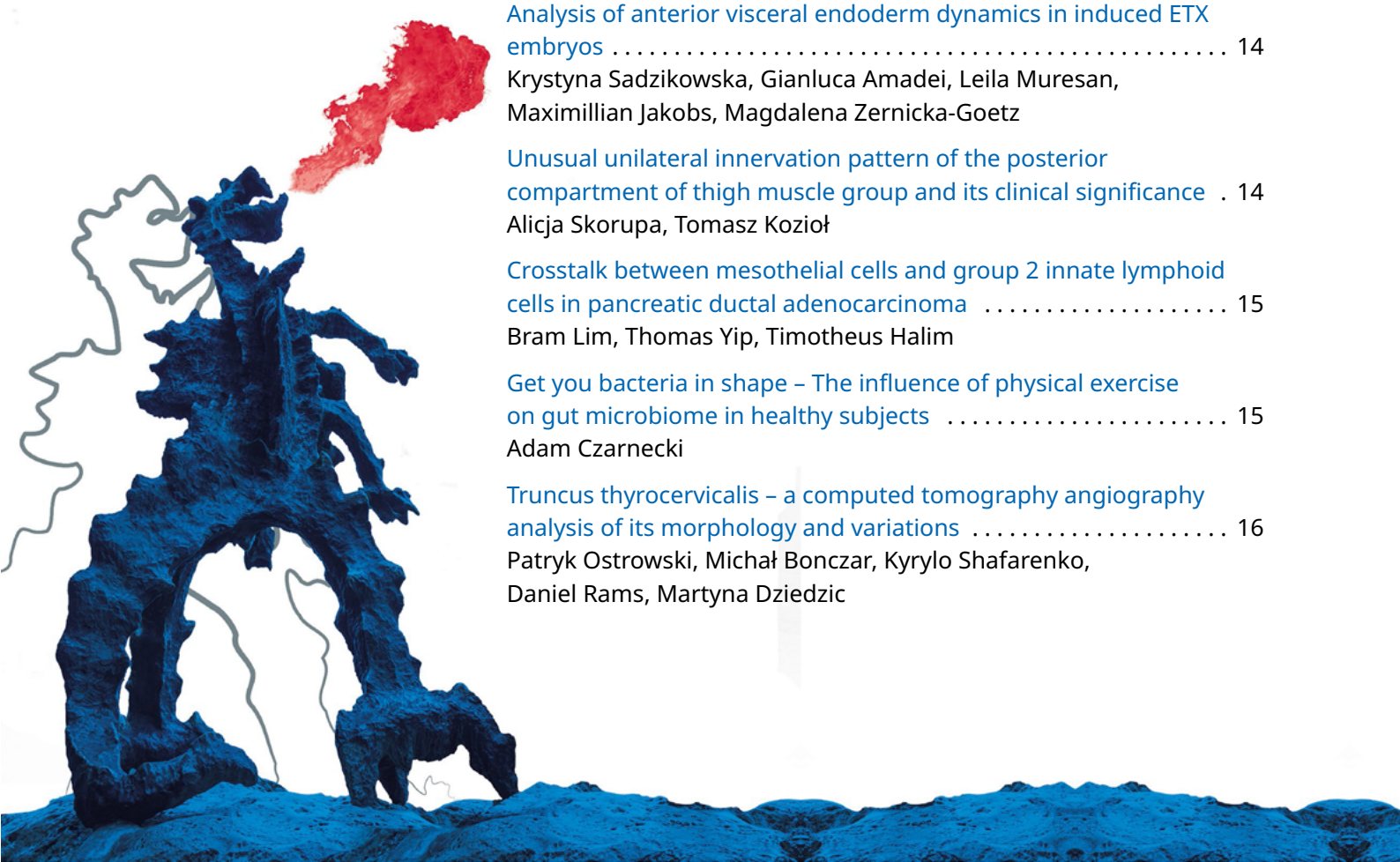

Assessment of the podophyllotoxin derivatives: KL-1, KL-2 and KL-3 on HaCaT and PBMC cells

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The Department of Histology and Embryology in the Medical Warsaw University, Students Scientific Group HESA

Trustee: Izabella Młynarczuk-Biały MD, PhD

Introduction: Podophyllotoxin (PPT) is a plant-derived inhibitor of cell proliferation. It is used in the treatment of anogenital warts during HPV infection. Current researchers are also focusing on its anti-cancer properties. The high toxicity makes it impossible to administer PPT intravenously or orally. In our research, we used 3 derivatives: KL-1, KL-2, and KL-3 with an additional benzothiazole group.
Aim of the study: In our study, we compared the toxicity of derivatives KL-1,2,3 and PPT at lower concentrations than before. Our aim was to compare how the three derivatives affect the normal cells of the human body like HaCaT and PBMC. Additionally, we assess the process of apoptosis and necrosis. Previous studies have shown their effectiveness on particular cancer cell lines.
Material and methods: We performed our research on the human keratinocyte line (HaCaT) and on the peripheral blood mononuclear cell (PBMC). We tested them with PPT (Sigma Aldrich) and, KL-1,2,3 synthesized in cooperation with the Department of Chemistry at the University of Warsaw. We assessed the cell viability (PrestoBlue Assay) and apoptosis/necrosis (Annexin V assays) mechanisms in five different concentrations: 0,05μM; 0,1μM; 0,5μM, 1μM, and 5μM.
Results: Each of the PPT derivates shows lower toxicity than parental PPT at the corresponding concentrations on HaCaT and PBMC lines. The results of IC50 were also significant, our tests indicated higher values for KL-1,2,3 compared to PPT. In Annexin V apoptosis and necrosis assay, KL1,2,3 didn't induce either apoptosis or necrosis at lower concentrations, whereas PPT lead to an increase of apoptosis and necrosis markers.
Conclusions: The higher values of IC50 for derivatives indicated lower toxicity on HaCaT and PBMC in comparison to PPT. The increased number of markers of apoptosis and necrosis is another confirmation of the higher toxicity of PPT itself. Preliminary results could suggest the possibility of the systemic use of our derivative.
Keywords: Podophyllotoxin derivatives, HaCaT, PBMC, toxicity

Mossy fibers morphology in the hippocampus of PTENfloxed mice

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Trustee: Adam Gorlewicz MD, PhD

Introduction: The classical trisynaptic circuit in the hippocampus is composed of: granule cells in the dentate gyrus, pyramidal neurons in CA3 and in CA1. The dentate gyrus creates synapses on pyramidal cells in CA3 via mossy fibers which create a distinguishable anatomical pattern called stratum lucidum. It has been demonstrated that the mossy fiber pathway in CA3 undergoes very particular structural rearrangement in mice with mutated PTEN gene – a genetic model of autism spectrum disorders that are associated with epilepsy.
Aim of the study: I hypothesize that this rearrangement of mossy fibers might influence proper information transfer in mossy fibers hippocampus. The aim of this work was to morphologically characterize the rearrangement of mossy fibers in mice with mutated PTEN gene in dentate gyrus granule cells.
Material and methods: Experiments were performed on male mice with a knockout of PTEN gene (PTENfloxed). Animals were anesthetized, placed in a stereotactic frame, and after that, viral solution was injected intracranially. Four weeks after vector injection brains of the animals were dissected, cryosectioned, and subjected to immunodetection. Fluorescent specimens were examined under a spectral confocal microscope. The synaptic clusters were labeled by ImageJ.
Results: Mossy fiber rearrangement in mice with mutated PTEN gene in dentate gyrus causes widening of stratum lucidum. The analysis of synaptoporin immunoreactivity demonstrates that the density of synaptoporin clusters and the average size of a cluster remains unchanged.
Conclusions: The PTEN mutation from dentate granule cells leads to stratum lucidum widening, which suggests altered mossy fiber synapses localization on CA3 cells. Moreover, unaffected density of synaptoporin clusters in affected stratum lucidum implicates an increased number of synapses in that region. That allows formulating hypotheses about altered information processing by mossy fibers in the hippocampus.
Keywords: epilepsy, mossy fibers, hippocampus, PTEN,

The effect of conditioned media from bladder cancer cells on exosomes secretion by mesenchymal stem cells

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Trustee: Małgorzata Maj, Associate Professor, MD, PhD

Introduction: Extracellular vesicles (EVs) are particles secreted by cells of all living organisms. They are classified into three main categories based on their size and release pathway, i.e., exosomes, microvesicles, and apoptotic bodies. EVs act as mediators of local and systemic intercellular communication via the delivery of bioactive molecules.
Aim of the study: The study aimed at determining the effect of soluble mediators released by cancer cells on the production and secretion of extracellular vesicles by mesenchymal stem cells derived from adipose tissue (ASCs).
Material and methods: To investigate the influence of factors secreted by cancer cells on adipose-derived stem cells, we used conditioned media (CM). Bladder cancer cells (5637, HT-1376, T24, HB-CLS-1) were cultured, after 72h conditioned media were harvest. Adipose stem cells culture was incubated for 72h in CM mixed with standard growth medium at a 1:1 ratio. CM was then exchanged for a growth medium supplemented with exosome-depleted serum. After subsequent 72h incubation, medium containing exosomes released ASCs was aspirated and used for EVs isolation (Total Exosome IsolationKit, ThermoFisher Scientific). EVs number was measured with ExoQuantTM Overall Exosome Capture and Quantification Assay Kit (BioVision). Exosomal protein content was measured spectrophotometrically.
Results: Cancer cell-derived factors altered ASCs morphology. Cells were enlarged with atypical shapes. Soluble mediators present in medium from 5637 and HB-CLS-1 cells reduced the number of proteins in exosomes released from ASCs. No differences were observed when cells were incubated in CM from HT-1376 cells.
Conclusions: Bioactive molecules secreted by cancer cells that represent non-muscle-invasive urinary bladder influence the secretory activity of ASCs. Our results indicate that the effects of conditioned media from cancer cell lines on ASCs are cell line-dependent.
Keywords: adipose-derived stem cells, bladder cancer, exosomes, extracellular vesicles

Analysis of anterior visceral endoderm dynamics in induced ETX embryos

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University of Cambridge / Physiology, Development and Neuroscience Department

Trustee: Prof. Magdalena Zernicka-Goetz, MD, PhD

Introduction: Peri-implantation and early post-implantation development of a mouse embryo can be mimicked in synthetic embryo systems, where different stem cell types aggregate and recapitulate early morphogenesis. In this study, we used induced ETX synthetic embryo (iETX) model to evaluate its utility in studying anterior visceral endoderm (AVE) migration. During this process, a subset of cells in the visceral endoderm is specified distally and migrates towards the prospective anterior of the embryo extending long cellular protrusions.
Aim of the study: To illuminate how multiple fundamental differences between iETX and natural embryos affect the process of AVE migration, which is a key event in antero-posterior axis specification.
Material and methods: Confocal microscopy was used to obtain live imaging data that was analysed and processed using Fiji/ImageJ, CytoButler AI algorithm and optical flow algorithms. scRNA data analysis was performed to compare AVE cells in iETX versus natural embryos.
Results: We showed that there is no significant difference in speed of AVE cell migration between iETX and natural embryos. We then explored AVE cell morphology and found significantly increased cell circularity in iETX and lack of long cellular protrusions. Single cell RNA sequencing data analysis pointed out differences in genes regulating cytoskeleton and cell-cell adhesion as well as genes of two signalling pathways – Wnt downregulation and Tgfβ upregulation.
Conclusions: We suggested the altered migration mode hypothesis, where iETX AVE cells, unlike their natural counterparts, reach their target in a protrusion independent manner. This may have many wider implications for embryology as it means that, in abnormal conditions, cells can adopt a different mechanism to achieve the same outcome.
Keywords: synthetic embryology, AVE migration, cell migration, stem cells

Unusual unilateral innervation pattern of the posterior compartment of thigh muscle group and its clinical significance

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Trustee: Michał Zarzecki, MD

Introduction: The posterior compartment of thigh muscle group is typically innervated by individual muscular branches of the anterior root of the sciatic nerve. Albeit, these exclude the short head of the biceps femoris, supplied by the poste-

rior root. There have been numerous variations of the sciatic nerve described in the literature, namely regarding its division point. However, less attention has been paid towards its particular branches in the posterior compartment of thigh.
Results: This study presents a rare finding of the sciatic nerve, encountered during a routine dissection of a 71-years-old formalin-fixed male cadaver. A single branch from the anterior root was observed to branch off the sciatic nerve on the left side, 21 mm inferior to the main head of the piriformis muscle, and 12 mm to its lower accessory head. The said single nerve was responsible for the innervation of the long head of the biceps femoris, the semitendinosus, semimembranosus and adductor magnus muscles, instead of the classically described individual muscular branches. Furthermore, the latter muscle was also supplied by the posterior branch of the obturator nerve. Contralaterally, the innervation pattern followed the classically described course. To the best knowledge of the authors, this is the first report to present this diverse unilateral innervation pattern of the posterior compartment of thigh.
Conclusions: Preoperative surgical planning for orthopaedic procedures involving the posterior thigh access, or conversely regional block of the sciatic nerve below the gluteal sulcus, requires from the medical professionals to be well acquainted with the possible anatomical variants encountered in the operated region. Moreover, this knowledge is of immense importance in the differential diagnosis and subsequent treatment of single branch neuropathies, e.g., the sciatica, the piriformis syndrome, amongst others.
Keywords: sciatic nerve; posterior compartment of thigh; regional nerve block; anatomy

Crosstalk between mesothelial cells and group 2 innate lymphoid cells in pancreatic ductal adenocarcinoma

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Trustee: Bram Lim, BA

Introduction: Pancreatic ductal adenocarcinoma (PDAC) carries a dismal prognosis which has remained virtually unchanged for decades. This is primarily because PDAC is usually diagnosed at the late stage when distant metastasis has occurred. While immunotherapy has been hailed as a potential treatment for metastatic cancers, little is known about the immunology of PDAC tumours. It has recently been suggested that mesothelial cells in PDAC tumours can dampen the antitumour immune response. Mesothelial cells are specialised stromal cells which line the surface of the omentum and visceral organs. They are thought to interact with tissue-resident immune cells known as group 2 innate lymphoid cells (ILC2).
Aim of the study: I propose that the crosstalk between mesothelial cells and ILC2s promotes a type 2 immune response which is protumorigenic in PDAC.
Material and methods: Mesothelial cells (CD45– EPCAM– CD31– PDPN+ PDGFRA– CD200+) were isolated from the mouse viscera by flow cytometry. They were then co-cultured with ILC2s, or grown in the presence of ILC2 conditioned media, IL-13 and IL-1β. Subsequently, gene expression changes in the mesothelial cells were determined by qRT-PCR. Mesothelial cells in mouse PDAC tumours were also further characterised by single-cell RNA sequencing and immunofluorescent microscopy.
Results: The presence of ILC2s enhanced mesothelial cell growth and promoted their upregulation of IL-33 (a cytokine which stimulates ILC2s) and downregulation of αSMA. Notably, this effect was driven by an ILC2 secreted component that was not the canonical ILC2 cytokine IL-13. Single-cell RNA sequencing of PDAC tumours in ILC2 knockout mice compared to normal mice similarly demonstrated that ILC2s promoted IL-33 production in mesothelial cells. Finally, immunofluorescent microscopy confirmed the localisation of mesothelial cells to the margin of PDAC tumours.
Conclusions: These results suggest that the ILC2-mesothelial cell axis is a potential therapeutic target to improve immunotherapy outcomes in patients with PDAC.
Keywords: Pancreatic cancer, ILC2, mesothelial cells, immunology, mouse

Get you bacteria in shape – The influence of physical exercise on gut microbiome in healthy subjects

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Trustee: Prof. Piotr Gawda, MD, PhD

Introduction: An abundance of recent studies emphasise importance of gut microbiome balance and diversity in maintaining human health. There is overwhelming evidence proving the importance of physical exercise on health of the human body, but its effect on gut microbiome remains unclear.
Aim of the study: The goal of this literature review is to establish how physical exercise changes the gut microbiome in healthy patients
Material and methods: PubMed search resulted in 30 scientific papers meeting our requirements, which were: (1) inspecting influence of physical exercise on the gut microbiota (2) the patients have no health conditions (3) patients are not professional athletes.
Results: Recent studies confirm positive impact of aerobic exercise on the biodiversity in the gastrointestinal tract, possibly explaining some of the proven benefits of exercise on the gut and the brain. The link between altered microbiota and improved training performance is also reported, making it a potentially important aspect for sport professionals. Some authors claim that the change in microbiota through training results in improved insulin resistance, and energy homeostasis. On the opposite it has been shown that training to exhaustion promotes inflammation in the intestines and dysbiosis which is linked to pathogenesis of cardiovascular, age related and psychiatric disease. Furthermore data suggest that by changing the composition of the bacteria, exercise may prevent physical frailty and cognitive dysfunction.

Conclusions: Exercise if done correctly, may be beneficial to maintaining health through increasing biodiversity in the intestinal tract. Some of the proven beneficial effects of exercise on human health may come from altered gut microbiom. However the influence of exercise on microbiota requires further analysis.

Keywords: physical activity; gut microbiome; gut-muscle axis; gut-brain axis; non-athletes;

Truncus thyrocervicalis – a computed tomography angiography analysis of its morphology and variations

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Jagiellonian University / Department of Anatomy

Trustee: Mateusz Koziej, Associate Professor, MD, PhD

Introduction: The truncus thyrocervicalis (TT) arises from the first part of the subclavian artery. The major anatomical textbooks describe it as having four branches, the inferior thyroid artery, the ascending cervical artery, the suprascapular artery, and the transverse cervical artery. However, variations in the branching of the TT have frequently been reported in the literature. Unfortunately, the number of studies on the variations of the branching of the TT is scarce, and those works that dealt with the different types of the said trunk are often inconsistent.
Aim of the study: The aim of this study is to provide physicians with crucial data on the morphology and variations of the truncus thyrocervicalis and its branches.
Material and methods: In order to establish the anatomical variations, their prevalence, and morphometrical data regarding the TT and its branches, a retrospective analysis was performed. Results of 55 consecutive adult patients of Polish origin who underwent neck and thoracic computed tomographic angiography (CTA) were used. The CTAs were analyzed using Materialise Mimics Medical version 21.0 software (Materialise NV, Leuven, Belgium) software. Statistical analysis was performed with SATISTICA v13.1 (StatSoft Inc., Tulsa, OK, USA).
Results: The branching pattern of the TT was presented as five types. Potential correlations were obtained between the age of the patients and the maximal diameter of the TT at the start point, the ostial area of the TT at the start point, the distance from the vertebral artery to the TT, and the ostial area of the internal thoracic artery, branching from the TT.
Conclusions: Knowledge about the TT and its branches might be of great importance when performing the sternocleidomastoid flap or the supraclavicular flap.
Keywords: Truncus thyrocervicalis: Anatomy: Morphology: Variations: Analysis

Morphometric evaluation of changes in the diameter of the internal mammary artery depending on sex and age

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Trustee: Prof. Krzysztof Bartuś, MD, PhD, Prof. Radosław Litwinowicz, MD, PhD

Introduction: Coronary artery bypass grafting (CABG) is one method of myocardial revascularization for severe coronary artery stenosis. For this purpose, arterial bypasses formed from the internal mammary artery (IMA), a branch of the subclavian artery with numerous side branches along its course, have been widely used. Although clinical observations confirm the patency of IMA bypasses even after 10 years, the literature lacks clear anatomical descriptions of age-related changes in the arterial lumen. The aim of this study was to determine whether IMA diameter changes with age and sex.
Materials and methods: Based on 104 thoracic angio-CT examinations of patients scheduled for cardiac surgery (47% female; 53% male), 208 IMAs were processed in specialized software and visualized bilaterally via semi-automated segmentation algorithms. The median age of the patients was 64.1(Q1:21.0;Q3:85.0). Based on age structure, three similar in number age categories were created, corresponding to the population of cardiac surgery patients: (1) 21-59 years (n=69), (2) 60-69 years (n=69), (3) 70+ years (n=70). The diameter of the vessel was measured each time on a axial section at the midpoint of the sternal attachment of the cartilage of the fourth rib. To detect a monotonic correlation with a power of 80% and a significance level of 5% (α, two-sided = 0.05; β = 0.2), the minimum sample size (within the cut-off range of r=0.2 to r=0.4) was calculated for 194 and 47 cases, respectively. For statistical analysis, the Spearman's rank correlation coefficient and the U-Mann-Whitney test were determined to assess whether sex or age category pairs (1) and (2), (1) and (3), and (2) and (3) showed statistically significant differences in IMA diameter. A p-value of less than 0.05 was
Results: The median IMA diameter was 2.66 mm (Q1:2.44 mm;Q3:2.85 mm). On average, IMA diameter values differed by sex (p=0.00) – 2.74 mm for males (Q1:2.55 mm; Q3: 2.87 mm) and 2.56 ± 0.35 mm for females. Correlation analysis in the form of a matrix was performed in pairs of variables, grouped by the vessel side and sex. In the vast majority of cases the p-value was greater than 0.05. Only in one case – correlation of both IMA with the age in male population (n=110), the level of statistical significance was exceeded (p=0.04), but the correlation (r=0.19) could not be confirmed due to insufficient sample size. U-Mann-Whitney test showed

no statistically significant differences in the analyzed pairs of variables (p>0.05).
Conclusions: The diameter of IMA is on average larger in men compared to women and does not correlate with the age of patients regardless of analyzed sex. Despite the many factors that make the procedure difficult to perform in older patients, the premise of decreased vessel lumen due to aging was excluded. The rationale obtained supports the optimal choice of IMA in CABG.
Keywords: internal thoracic artery, CABG, cardiovascular surgery, anatomy, IMA

Arteria profunda brachii: a meta-analysis of its morphology and a review of the literature

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Jagiellonian university / Department of anatomy

Trustee: Mateusz Koziej, Associate Professor, MD, PhD

Introduction: The profunda brachii artery (PBA) is the first and largest branch of the brachial artery. Multiple variations in the origin, termination, and diameter of the PBA have been reported in the literature.
Aim of the study: The aim of this study was to provide a detailed analysis of the origin and diameter of the profunda brachii artery, using the available data in the literature.
Material and methods: Major online medical databases such as PubMed, Scopus, Embase, Web Of Science, and Google Scholar were searched to find all studies considering origin variations and the diameter of the PBA.
Results: The prevalence of PBA that originates directly from the axillary or brachial artery was shown to be 92.87%. PBA originating indirectly from the axillary or brachial artery, as a common trunk with other arteries, was found to be 7.13%. The mean diameter of the PBA was shown to be 2.05 mm.
Conclusions: The authors of the present study believe that this is the most accurate and up-to-date meta-analysis considering origin patterns and the diameter of the PBA. Additionally, this study contains a comprehensive literature review in which current detailed anatomical knowledge concerning the PBA was gathered. The results of this study could provide a helpful tool for physicians, especially surgeons, who deal with an upper limb in their daily practice.
Keywords: profunda brachii artery: anatomy: meta-analysis: upper limb

Evaluation of the metabolome profile during allergen-specific immunotherapy in bee venom hyperreactivity patients

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Trustee: Kamil Grubczak, MD, PhD

Introduction: Oversensitivity to bee venom is one of the most common causes of severe allergic reactions in humans. A single sting can lead to various responses ranging from mild pain and swelling to life-threatening anaphylaxis, especially in allergic patients. Allergen-specific immunotherapy (AIT) focuses on inducing and maintaining the tolerance to the specific allergen by subcutaneously administering increasing concentrations of it. However, despite the widespread application of this treatment its influence on the metabolome profile has not been described.
Aim of the study: Our study aimed to evaluate the metabolome profile of bee venom hyperreactivity patients before and during AIT implementation.
Material and methods: The metabolome profile within patients' plasma obtained from whole blood samples prior to and during therapy was assessed using LC-MS and FIA at the Clinical Research Center, Metabolomics Division. Subsequently, biostatistical analyses of the metabolome profile changes and their associations with routine diagnostic allergy-related parameters were performed.
Results: Firstly, we indicated a difference in metabolomic profiles between the bee allergic patients and the healthy control group. We noticed the significant enhancement of inter alia biogenic amines, amino acids and some glycerophospholipids at the beginning of treatment. Moreover, we indicated a potential correlation with diagnostic parameters within these groups of compounds. Before therapy implementation, we did not observe a strong correlation between the biogenic amines and amino acids with tryptase level or IgE. Most significant associations with the baseline values of metabolites were observed with the parameters following 1-2 years of therapy. Biogenic amines and amino acids correlated negatively, especially with the tryptase level.
Conclusions: In conclusion, characteristic profile of metabolome demonstrated in patients allergic to bee venom might play a crucial role in the course of hyperreactivity. Implementation of AIT affects the metabolome profile of bee allergic patients directly. Selected metabolites demonstrate promising values as a future prognostic parameter.
Keywords: bee venom hyperreactivity, metabolome, allergen-specific immunotherapy

Cardiology, Invasive Cardiology, Cardiosurgery

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Coordinators:

Miłosz Błoński, Piotr Walczak

List of papers

The implementation of the heart failure therapy and its prognostic significance in dilated cardiomyopathy

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Trustee: Paweł Rubiś, Associate Professor, MD, PhD

Introduction: The optimal medical treatment extends lifespan of patients with heart failure (HF) and dilated cardiomyopathy (DCM). However, despite known prognostic significance of the dosages of the pharmacological therapy, most of HF patients do not have proper up-titration.
Aim of the study: Analysis of the implemented HF therapy between alive and dead DCM patients.
Material and methods: We analysed retrospectively 781 DCM patients (aged 53±13 years, 62,2% male, LVEF 27,4±11,1%, NYHA 2,4±0,9) from 2009-2020. Patients were divided according to the outcome– dead vs. alive.
Results: During 46,7±30,5 months 121 of 781 patients (15,5%) died. They less often used renin-angiotensin-aldosterone system inhibitors (RAASi: ACEi/ARB/ARNI) (81% vs. 89,6%, p=0,007) and beta blockers (BB) (92,5% vs. 96,8%, p=0,03), but both groups did not differ in terms of mineralocorticoid receptor antagonists' (MRA) implementation (90,8% vs 85%, p=0,09). We observed that only 138 (17,7%) patients had maximum dosage of RAASi, 236 (30,2%) patients of BB and 274 (35,1%) patients of MRA. Only the prevalence of BB maximum dosage differentiated groups (dead vs. alive: BB: 55.9±42.2 vs. 63.9±55.1%, p=0,04; RAASi: 44.0±26.3 vs. 49.3±36.3%, p=0,15; MRA: 71,1±32,6 vs. 69,8±32,7%, p=0,15).
Conclusions: Despite novel pharmacological therapies, the mortality rate in DCM is still very high and reaches over 15% in 4 years. Dead patients received less frequent optimal HF therapy and lower BB doses. Moreover, HF treatment was up-titrated to the maximal recommended doses only in about half of DCM patients.
Keywords: Dilated Cardiomyopathy, Heart Failure, Pharmacotherapy

Procedural and 1-year outcomes following large vessel coronary artery perforation treated by covered stents implantation

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Trustee: dr hab. med., prof. AWF Rafał Januszek

Introduction: Coronary artery perforation can occur during percutaneous coronary intervention, this serious but not very often side effect is treated with covered stents. Data regarding the clinical outcomes are scarce. I would like to present outcomes from my publication.
Aim of the study: The aim was to evaluate the procedural, 30-days and 1-year outcomes after coronary artery perforation treated by covered stent implantation.
Material and methods: This registry included data of patients with coronary artery perforation treated by covered stent implantation. The primary endpoint was the composite of major adverse cardiac events defined as cardiac death, target lesion revascularization and myocardial infarction. All stents were implanted into a vessel of minimum 2 mm diameter and were delivered to the perforated segment and rest of treatment was in accordance with the recommendations of the clinical practice guidelines. Lesions were defined according to the classification proposed by the American College of Cardiology/American Heart Association, The three-stage Ellis classification and TIMI in all patients. Baseline clinical characteristics data are shown as means and standard deviation or numbers and percentages. Kaplan-Meier curves were used to present the unadjusted time-to-event data. Categorical data were analyzed with the Chi-square or Fisher's exact test. The statistical analysis was performed using Medcalc.
Results: The registry included 119 patients. Successful sealing of the perforation was achieved in 99 (83.2%) patients. During the follow-up, 26 (26.2%) patients experienced of major adverse cardiac events [7 cardiac deaths, 13 target lesion revascularizations, 11 MIs]. Stent thrombosis occurred in 6 (6.1%) patients. Periprocedural death occurred in eight patients.
Conclusions: : The use of covered stents is an effective treatment of CAP. Patients should remain under follow-up due to relatively high risk of cardiac events.
Keywords: : coronary artery perforation; clinical outcomes; covered stents; follow-up 1year

Angina in patients with chronic coronary syndromes according to coronary microcirculatory status

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Trustee: Łukasz Niewiara MD, Prof.
Paweł Kleczyński MD, PhD, Prof. Jacek Legutko MD, PhD

Introduction: Contemporary practice shows that about 30% of patients undergoing percutaneous coronary intervention (PCI) still have some persistent angina symptoms. Coronary microcirculatory dysfunction (CMD) might be one of the possible pathomechanisms leading to those symptoms.
Aim of the study: Our aim was to assess angina intensity in patients with chronic coronary syndromes, with and without significant coronary stenosis, according to coronary microcirculatory status.
Material and methods: Patients undergoing coronary angiography due to chronic coronary syndromes underwent coronary physiology assessment (fractional flow reserve – FFR, coronary flow reserve -CFR and index of microcirculatory resistance – IMR measurements) during stable hyperemia obtained with continuous intravenous adenosine infusion. In

haemodynamically significant lesions (FFR≤0.80), revascularization was performed. Patients' symptoms were assessed on admission and after 24 months of follow-up. Clinical improvement was defined as a decrease of at least one class in CCS scale during follow-up.
Results: Analysed group consisted of 101 patients, 74% male, with a median of 63 y.o., mostly with history of arterial hypertension (96%) and dyslipidemia (91%). Tobacco use (either current or in the past) was reported by 44% of patients. Coronary microcirculatory dysfunction was present in 45 cases (45%). In 50 patients (50%), there was at least one significant coronary stenosis that was treated with PCI. There was no significant improvement in angina intensity in patients with CMD, neither in subgroup undergoing PCI nor those without revascularization (36% or 41% respectively, p=NS for pre-post comparisons). However, in patients with normal coronary microcirculation, angina improved in over 63% after PCI and in 58% of cases of those without stenosis (p=0.032 and p=0.021 respectively for pre-post comparisons).
Conclusions: 1. Patients undergoing PCI with concomitant CMD may be at risk of no significant improvement of angina intensity symptoms, following the procedure. 2. Further research is needed to confirm this observation.
Keywords: Coronary microcirculatory dysfunction, coronary physiology assessment, angina

ECG changes in pulmonary arterial hypertension patients with near-normalisation of pulmonary hemodynamics

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Trustee: Prof. Grzegorz Kopeć, MD, PhD, Marcin Waligóra, MD, PhD

Introduction: Pulmonary arterial hypertension (PAH) is a disease with a poor survival rate (2.7 years) if untreated. However, introduction of efficient treatment results in significant improvement in prognosis. To achieve optimal effect, patients require regular and careful assessment. Despite several recommended strategies for such assessment, there are still gaps in evidence whether ECG is viable for identification of treatment response.
Aim of the study: Assessment of the utility of ECG criteria of right ventricle hypertrophy (RVH) for identification of near-normalisation of pulmonary hemodynamics in patients with PAH.
Material and methods: We enrolled 11 patients (10 females) aged 39 (30-52), with diagnosis of pulmonary arterial hypertension. Patients initially had severely increased mean pulmonary artery pressure (mPAP) of 45 mmHg median which dropped to 25 mmHg after introduction of treatment. We analysed and compared pre- and post-normalisation ECG records of each patient. Statistical analysis of the results was performed using Tibco Statistica 13.3.
Results: As a result of improved hemodynamics we observed a total normalisation in all five major criteria of RV hypertrophy in 37.5% of patients. Additionally, we observed decrease in RVH criteria in all patients: RaVR: (2.5 (1-3.5) – 1.5 (0.5-2), p=0.007), RV1: (2.5 (1.5-6) – 1 (0.5-1), p=0.007), SV5: (7 (5-10) – 4 (2-8), p=0.007), SV6: (4.5 (3-5) – 2 (1.5-4), p=0.003), RV1+SV5,6: (10.5 (6.5-14) – 5 (3-8.5), p=0.005). Amplitude of RV1 dropped the most, by 71.4% (33.3-75%). Furthermore, we observed a correlation between decrease of mPAP value and S wave-related criteria: SV5: (R=0.79, p=0.004), SV6: (R=0.79, p=0.004), RV1+SV5,6: (R=0.72, p=0.01).
Conclusions: Near-normalisation of pulmonary hemodynamics in PAH patients is reflected by significant decrease in value of all S wave-related criteria of RV hypertrophy. Decrease in value of the aforementioned criteria correlates strongly with drop in mPAP. However, total normalisation of the ECG was rarely observed in the enrolled population.
Keywords: pulmonary hypertension, right ventricle hypertrophy, ECG, pulmonary hemodynamics

Seasonality of infective endocarditis among patients of the University Hospital in Krakow – a retrospective study

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Trustee: Agnieszka Olszanecka, Associate Professor, MD, PhD

Introduction: Seasonal variation has been observed for various bacterial and viral infections (eg COVID19). Data on the seasonality of infective endocarditis are limited and ambiguous; furthermore, no studies have been done on the Polish population.
Aim of the study: The main objective of the research was to compare the incidence of IE in different seasons and to check if IE caused by S. aureus is associated with a seasonal pattern.
Material and methods: The retrospective study was based on the identification of patients with IE, hospitalized between 2005-2022, by searching the ICD-10 code (I33, I38, and I39) in the medical records system. The 'seasons' were defined by calendar seasons, distributing patients into 4 groups (winter, spring, summer, autumn). Comparison of the distribution of IE incidents by season was performed with ch2 test.
Results: Ninety seven patients were included (mean age 63 years (range 20-94), 37 women (38.14%)). Left native valve IE was diagnosed in 51 patients, prosthetic valve IE in 21, right valve IE in 23 and cardiac implantable electronic devices IE in 9 subjects. The outcomes included death (n=11), embolism (n=12), metastatic infections (n=5) and cardiac surgery (n=46). There were no differences in the incidence and outcome of IE by season – incidence – winter n=19 (19.59%), spring n=28 (28.87%), summer n=26 (26.80%), and autumn n=24 (24.74%); (p= 0.61). Infections caused by S. aureus (n=24) also did not present seasonal pattern (p=0.73).

Conclusions: We identified no seasonal pattern in IE, therefore IE should be taken into account in differential diagnosis at any point of the year. It is crucial to have high clinical suspicion for this diagnosis in all febrile and septic patients even in epidemics of seasonal-dependent infectious diseases including influenza or COVID-19.
Keywords: infective endocarditis, IE, seasonality, heart valves, S. aureus

The assessment of the modifiable predictive factors of exercise capacity improvement in patients following myocardial infarction after 3-month cardiac rehabilitation program in Poland – preliminary report on single-center experience

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Trustee: Dominika Klimczak-Tomaniak, MD, PhD

Introduction: According to ESC 2021 Guidelines participation in a comprehensive cardiac rehabilitation(CR) after atherosclerotic cardiovascular disease events, including myocardial infarction(MI), is recommended to improve patients' outcome(class IA), and modifiable, life-style factors may influence CR outcome.
Aim of the study: We aim to assess the effect of life-style associated predictive factors on the metabolic equivalent(MET) increase in patients following a 3-month CR program after MI.
Material and methods: Initially retrospective data was collected from 104 patients hospitalized due to MI and subsequently enrolled into the CR program in one cardiology department between August/202-March/2022. For 45 of them 3-month follow-up was complete and those were included in the analysis. All patients were submitted to exercise testing before and after CR(36 sessions, 2-3 times/week). All participants were assessed for: sex, BMI, smoking, diabetes mellitus(DM), lipid profile, hypertension, ejection fraction(EF) in post-MI period. Patients were subjected to exercise test and laboratory tests at the beginning of CR and after 3-month CR.
Results: The study group consisted of 7 females(15%) and 38 males(85%) and 33% of which presented with BMI>30(n=15), 15(33%) of the patients were current smokers and 23(51%) quit smoking, 9(20%) patients had DM, 23(51%) hypercholesterolemia(LDL>115mg/dl) and 25(55%) hypertension. The mean age was 61,49±1 years old, mean EF=48,96±8,00% and mean LDL=110,38±34,77mg/dl. None of the patients died during the 3-month program. We found a significant increase in MET after 3 months in the study population(mean,±SD) 6.15±1.45 to 6.62±2.00(p=0.02). Significant improvement was also observed for subgroups including: males 6,33±1,37 to 7,01±1,68(p<0,001); non-obese patients with BMI<30 6,26±1,33 to 6,85±1,63(p<0,001); smokers 6,02±1,56 to 6,73±1,94(p<0,001); patients with hypercholesterolemia 6,45±1,44 to 7,18±1,78(p<0,001), patients with hypertension 5,79±1,48 to 6,49±1,78(p<0,001). Females, non-smokers, patients with BMI>30 showed no significant increase.
Conclusions: Exercise capacity of post-MI patients after CR improves irrespectively of DM or hypertension. Modifiable risk factors such as smoking, and obesity may influence the outcome of patients post-MI during comprehensive care program.
Keywords: Cardiac rehabilitation, MET, myocardial infarction, car,

The New York Heart Association functional classification and comorbidities, but not history of shock delivery, impact quality of life in patients after transvenous implantable cardioverter-defibrillator placement

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Trustee: Paweł T. Matusik, MD, PhD

Introduction: Implantable cardioverter defibrillator (ICD) placement, although lifesaving, could severely affect patients' quality of life (QoL). With novel therapies introduced, there is a need for assessment of the impact of clinical data on QoL in patients with ICD.
Aim of the study: Evaluation of QoL and factors influencing QoL in transvenous ICD recipients without cardiac resynchronization therapy capability.
Material and methods: We included patients with classical ICD who were enrolled at the John Paul II Hospital and its ambulatory clinic from August to November 2021. Patients were asked to complete questionnaires, including the Short Form Health Survey with 36 questions, version 2.0 (SF-36v2). Clinical data was also collected from medical records.
Results: We studied 84 patients in median age of 67.5 [60.0-74.5] years. Most of the patients underwent ICD placement in primary sudden cardiac death prevention, had heart failure and were in New York Heart Association functional classification (NYHA) class II or higher. Coronary artery disease (72.4%), hypertension (71.4%) and atrial fibrillation (52.4%) were frequent in the studied population. Women (n=16) had a lower Mental Component Summary score than men (p=0.03). Age was negatively correlated with the Physical Functioning (R=-0.23, p<0.05) and Physical Component Summary (R=-0.23, p<0.05). Patients with NYHA class higher than

II had a lower score in all physical components and the Vitality subscale. Patients with comorbidities scored lower on multiple QoL subscales: diabetes mellitus was related to Social Functioning, thyroid disease to Vitality, while chronic kidney disease impaired all physical components and Vitality. Previous ICD shock history (40.5%) was not associated with QoL.
Conclusions: Higher NYHA class and comorbidities significantly affect patients' QoL. Although often reported, having experienced ICD shock did not alter QoL, which should influence patients counselling and decision-making on ICD placement.
Keywords: ICD, quality of life, implantable cardioverter-defibrillator

Does diabetes compensation have an effect on coronary flow reserve in patients with stable angina?

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Trustee: Łukasz Niewiara, MD, PhD, Piotr Szolc, MD, PhD

Introduction: In 30-40% of patients with stable angina decreased coronary flow reserve (CFR) corelates with worse outcome.
Aim of the study: We wanted to search for differences in CFR in patients with well controlled and poorly controlled diabetes.
Material and methods: We enrolled 157 consecutive patients undergoing diagnostic coronary assessment. In all patients invasive assessment of CFR was done with continuous infusion of adenosine. Poorly controlled diabetes was identified as increased HBA1C and fasting glucose levels. We divided our group into 3 groups: non-diabetic (n=90), well controlled DM (n=31), poorly controlled DM (n=36). In following groups HBA1C and fasting glycemia were respectively: 5.7%/5.4mmol/l; 6.05%/5.8mmol/l; 7.7%/9.9mmol.
Results: We enrolled 157 patients with mean age 65,5, BMI – 28.1kg/m2, 26% of them were female and 97% had arterial hypertension. We found that median CFR in group of non-diabetics was 2.15 (1.5-2.95), in well controlled DM was 2.30 (1.75-2.85) and poorly controlled – 1.75 (1.37-2.32). There was significant difference between non-diabetics and poor controlled DM as well as well controlled DM and poor controlled DM. There was no significant difference between non diabetics and well controlled.
Conclusions: Patients with poorly controlled diabetes had worse coronary flow reserve than patients with well controlled as well as non-diabetic patients. Moreover, there was no difference in CFR between non diabetic and well controlled DM.
Keywords: DM, CFR, diabetes

Rotational coronary angiography with supplementary projections versus static one in terms of contrast volume and radiation dose

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Trustee: Łukasz Rzeszutko MD, PhD, Michał Chyrchel MD, PhD

Introduction: Rotational coronary angiography (RC) is connected with less contrast volume and decreased radiation exposure than the static one (SC) while providing comparably accurate and reliable visualization of the coronary arteries. Sometimes RC may require supplementary images to correctly assess the coronary arteries, especially when the operator is on a learning curve. Thus it is important to check if RC with additional projections still retains its advantages.
Aim of the study: To compare RC procedures with supplementary projections with SC procedures in terms of contrast volume and radiation dose.
Material and methods: Data of 53 RC procedures with at least 1 supplementary projection and 131 SC procedures performed in a single cath lab were compared using appropriate statistical tests. RC procedures consisted of 2 cases with an assessment of both coronary arteries using RC, while in the rest of the cases only the left coronary artery was evaluated using RC and the right coronary artery using SC.
Results: The number of additional images performed in RC procedures ranged from 1 to 6. RC was associated with lower radiation dose (RC vs SC [Gy/cm2]: 5052 (3591;6694) vs 6504 (4160;9418) p=0.02). There were no significant differences in contrast volume between groups (RC vs SC [ml]: 40 (35;50) vs 50 (35;55), p=0.07) and time of the procedure (RC vs SC [min]: 30 (25;30) vs 30 (25;30), p=0.65).
Conclusions: Despite supplementary images, RC exposes patients to a lower radiation dose than SC. The influence of additional projections in the RC on the contrast volume requires further research. RC seems to be as good as SC and in some cases superior, even when the operator is on the learning curve.
Keywords: rotational coronary angiography, contrast volume, radiation

Understanding the patient's view on the safety and effectiveness of statin therapy – a questionnaire study

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Trustee: Agnieszka Olszanecka, Associate Professor, MD, PhD

Introduction: Statins are commonly used and effective cholesterol lowering drugs, which reduce the risk of atherosclerosis and related complications. In recent years, medical information has become significantly more available, while the reliability of data from nonprofessional sources is limited, potentially resulting in patients' distrust of doctors, as well as reluctance to undertake therapy.
Aim of the study: Assessment of patients' perception of the safety and efficacy of statin therapy.
Material and methods: The study was an observational survey. Participants were recruited from the outpatient of the University Hospital. Data on statin use by patients and perceived safety of this therapy collected using a dedicated questionnaire. Subgroup analysis was performed for patients taking a statin-containing drug (S) and non-statin patients (NS).
Results: The analyzed group included 115 patients (mean age: 64.5±12.8 years). Among them, 75 (65%) were current statin users. A quarter of the patients (n=30, 26%) declared that they often hear negative opinions about statins, 28 (24%) rarely, and 57 (50%) have never heard negative opinions about statins. The most common source of negative opinions were conversations with friends – 50 [43%], the Internet (16, [14%]), television (10, [9%]) and radio (2, [2%]). Sixteen patients (14%) indicated that statins are harmful, 64 [56%] respondents did not have an opinion on the harmfulness of statins, while 33 [29%] indicated their safety. Among patients with a clearly defined opinion, distrust of statin safety is significantly more common in the NS group compared to the S group (6 [43%] vs 27 [73%], respectively, p=0.045).
Conclusions: The belief that statins are unsafe among patients is prevalent. One of the future challenges for physicians is to make patients aware that statins are safe and effective. Explicitly addressing patient concerns and priorities by explaining the reasons for prescribing statins and the risks involved can improve patient compliance.
Keywords: statins, patient adherence, fear of statins, side effects

Circulating miRNAs as independent predictors of cardiovascular mortality in patients with type 2 diabetes mellitus

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Trustee: Ceren Eyileten, Assistant Professor, MD, PhD

Introduction: MicroRNAs (miRNAs, miR) are essential gene expression regulators involved in numerous biological processes and diseases including type 2 diabetes (DM).
Aim of the study: We aimed to determine the predictive value of selected circulating miRNAs for cardiovascular and all-cause mortality and their potential usefulness as biomarkers in DM patients.
Material and methods: Two hundred fifty-two patients with diabetes were enrolled in the study. Among the patients included, 26 (10.3%) patients died during a median follow-up of 71 months (5.9 years). Plasma miR-191 and miR-16 expressions were assessed by quantitative real-time PCR and compared between the patients who survived and those who died.
Results: Patients who died from cardiovascular-related death had significantly higher expression of miR-191 and miR-16 as compared with patients who survived (p = 0.003, p = 0.001, respectively). The study population was divided into two subgroups by using ROC curve analysis for each miRNA, i.e., low- or high value of single miRNAs. Kaplan Meier and Cox regression were performed for survival analysis. High expression levels of miRNAs were associated with cardiovascular mortality, when the models included one single miRNA and other covariates: miR-191 (HR = 4.793, 95% CI: 1.48–15.579; p = 0.009) and miR-16 (HR = 4.66, 95% CI: 1.48–14.75; p = 0.009). Furthermore, miRNAs expression between clopidogrel and the whole acetylsalicylic acid groups (i.e., 75 mg +150 mg), miR-191 expressions was significantly higher in the clopidogrel subgroup (p = 0.010), whereas miR-16 did not differ (p =0.127).
Conclusions: To conclude, miR-191 and miR-16 expression are strong and independent predictors of cardiovascular and all-cause mortality in patients with T2DM. Moreover, miR-191 and miR-16 present significant interactions with antiplatelet treatment regimens and clinical outcomes.
Keywords: miRNA, diabetes mellitus, cardiovascular mortality, biomarkers

COVID-19

Jury:

Prof. Krzysztof Bryniarski, MD, PhD
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Coordinators:

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List of papers

Thrombosis-related circulating miRNAs and their importance in patients hospitalised for COVID-19

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Trustee: Ceren Eyileten, Assistant Professor, MD, PhD

Introduction: SARS-CoV-2 tropism for the ACE2 receptor, along with the multifaceted inflammatory reaction, is likely to drive the generalized hypercoagulable state seen in patients with COVID-19.
Aim of the study: We aimed to identify the role of microRNAs (miRNAs) in ACE2-related thrombosis in coronavirus infection.
Material and methods: Using the original bioinformatic workflow and network medicine approaches we reanalyzed four coronavirus-related expression datasets and performed co-expression analysis focused on thrombosis and ACE2 related genes. We validated expressions of those miRNAs in 79 hospitalized COVID-19 patients and 32 healthy volunteers by PCR, monitoring miRNAs patterns during the acute phase of COVID-19, as well as prognostic potentials of these miRNAs as biomarkers.
Results: We identified EGFR, HSP90AA1, APP, TP53, PTEN, UBC, FN1, ELAVL1 and CALM1 as regulatory genes, potentially playing a pivotal role in COVID-19 related thrombosis. We found miR-16-5p, miR-27a-3p, Let-7b-5p and miR-155-5p as regulators in coagulation and thrombosis. We observed in separate cohorts of COVID-19 patients and healthy controls that (i) expression of miR-16-5p, miR-27a-3p and miR-155-5p increased during observation, compared to baseline measurements; (ii) a low baseline miR-16-5p expression presents predictive utility in assessment of length of hospital stay or death in follow-up as a composite endpoint (AUC:0.810, 95% CI, 0.71-0.91, p<0.0001); (iii) low baseline expression of miR-16-5p and diabetes mellitus are independent predictors of increased length of stay or death according to a multivariate analysis (OR: 9.417; 95% CI, 2.647-33.506; p=0.0005 and OR: 6.257; 95% CI, 1.049-37.316; p=0.044, respectively).
Conclusions: This study enabled us to better characterize changes in gene expression and signaling pathways related to COVID-19 thrombosis. In this study we identified, characterized and validated miRNAs which could serve as novel, thrombosis-related biomarkers of COVID-19, potentially used for early stratification of patients and prediction of infection severity development in an individual.
Keywords: COVID-19, miRNAs, ACE2, SARS-CoV-2, thrombosis, biomarkers

The Impact of the COVID-19 Pandemic Lockdown on Pediatric Infections

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Trustee: Prof. Wojciech Feleszko, MD, PhD

Introduction: Since the SARS-CoV-2 outbreak, many countries have introduced measures to limit the transmission.
Aim of the study: Our aim was to investigate how the SARS-CoV-2 pandemic has changed the morbidity associated with the most common pediatric pathogens and the incidence of lower respiratory tract infections (LRTI) in children.
Material and methods: The data based on ICD-10 codes of lower respiratory tract infections and microbiological analysis of respiratory and gastrointestinal infections were collected.
Results: The retrospective five-year analysis of the medical records revealed a substantial decrease in respiratory tract infections during the pandemic year (from April 2020 to March 2021). We noted an 81% decline in the LRTI-associated hospital admissions based on the ICD-10 analysis (from a mean of 1170 admissions per year in the previous four years to 225 admissions between April 2020 through March 2021). According to microbiological analysis, there were 100%, 99%, 87%, and 47% drops in influenza virus, respiratory syncytial virus, rotavirus, and norovirus cases reported respectively during the pandemic season until April 2021 in comparison to pre-pandemic years. However, the prevalence of gastrointestinal bacterial infections was stable. Moreover, in August 2021, an unexpected rise in RSV-positive cases was observed.
Conclusions: The measures applied during the COVID-19 pandemic turned out to be effective but also had a substantial contribution to the so-far stable epidemiological situation of seasonal infections.
Keywords: pediatrics; SARS-CoV-2; hospitalizations; respiratory tract infection; respiratory viruses; RSV; epidemiology

The quality of life assessment in patients with chronic myeloid leukemia during the COVID-19 pandemic

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Trustee: Prof. Tomasz Sacha MD, PhD, Elżbieta Szczepanek MD, Ositadima Chukwu MD

Introduction: The introduction of tyrosine kinase inhibitors (TKIs) has significantly improved the long-term outcomes and quality of life (QoL) in patients with chronic myeloid leukemia (CML). The Covid-19 pandemic could affect the well-being of CML patients.
Aim of the study: To investigate the QoL of CML patients during the Covid-19 pandemic.
Material and methods: This is a prospective survey-based study. We used the EORTC QoL questionnaire, including functioning scales, global health status scales, and symptom scales in the studied population consisting of 39 patients. The median age was 55.72 years (ranged 34.96 – 81.68). The questionnaires were administered and collected during patients' follow-up visits between March 2021 and March 2022. Statistical analysis was performed using R software (R version 4.0.3.).
Results: EORTC dimension scores were as follows: global health status QoL 66.67 (IQR 16.67 – 100); functioning scales: physical functioning 80 (20 – 100), role functioning 100 (0 – 100), emotional functioning 75 (16.67 – 100), cognitive functioning 83.33 (0 – 100), social functioning 83.33 (0 – 100); symptom scales: fatigue 33.33 (0 – 100), nausea and vomiting 0 (0 – 50), pain 33.33 (0 – 83.33), dyspnoea 0 (0 – 66.67), insomnia 33.33 (0 – 100), appetite loss 0 (0 – 100), constipation 0 (0 – 100), diarrhea 0 (0 – 66.67), financial difficulties 0 (0 – 100). Quality of life was lower in patients older than 50 years old (58.33 (50 – 66.67) vs 75 (66.67 – 83.33), p= 0.0203).
Conclusions: During the COVID-19 pandemic, emotional functioning was the worst item among functioning scales. Fatigue, pain, and insomnia were the most burdensome symptoms assessed on the symptom scales. Patients aged 50 years or older referred lower QoL than younger patients.
Keywords: chronic myeloid leukemia; quality of life; EORTC QLQ-C30 questionnaire; Covid-19 pandemic

Thrombin generation profile and thrombophilia-related factors in hospitalized COVID-19 patients – a preliminary study

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Trustee: Stanisława Bazan-Socha, Associate Professor, MD, PhD

Introduction: Coronavirus disease 2019 (COVID-19) is associated with an increased thromboembolic risk. However, the mechanisms triggering clot formations in these patients are unknown.
Aim of the study: To evaluate hypercoagulable mechanisms in COVID-19 patients, we investigated laboratory prothrombotic plasma properties in hospitalized COVID-19 subjects.
Material and methods: We studied 46 adult Caucasian symptomatic but noncritically ill hospitalized COVID-19 patients (median age 57 years; 61% men) and 48 controls. Laboratory analysis included: in vitro plasma thrombin generation profile by calibrated automated thrombogram (CAT), and thrombophilia-related factors, including plasma protein C and antithrombin activity, free protein S levels and antiphospholipid antibodies, but also the presence of factor V Leiden (FVL), prothrombin 20210 mutations.
Results: COVID-19 patients showed 19% lower protein C activity ($p<0.001$), 31% decrease in free protein S levels ($p<0.001$) and a higher prevalence of IgM anticardiolipin antibodies (41% vs. 8%, $p<0.001$), as compared to controls. There was no statistical difference in antithrombin activity between groups. The FVL mutation was found in four patients. The prothrombin 20210 variant was detected in only one case. In turn, the endogenous thrombin potential was similar in both groups. Thrombin generation curve revealed 67% longer lag-time and 40% longer time to peak ($p<0.001$, both) and 18% lower maximum concentration of thrombin formed ($p=0.02$) in COVID-19 patients. During hospitalization, two patients died; one death was related to pulmonary embolism (PE). Altogether, PE occurred in four patients. They were characterized by a higher body mass index and a lower activated protein C resistance than other COVID-19 patients. No deep vein thrombosis or ischemic stroke have been recorded in our patients.
Conclusions: Lower levels of natural anticoagulants with an unchanged thrombin generation potential could indicate an unfavourable prothrombotic state in COVID-19 patients. The clinical relevance of these findings, as well as an optimal thromboprophylaxis strategy, require further investigation.
Keywords: COVID-19, thrombin generation, thrombosis, natural anticoagulants, calibrated automated thrombogram

Infections in the COVID-19 era – the experience of Haematology Clinical Department of University Hospital in Cracow

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Introduction (orginal work & case report): The COVID-19 has diametrically changed epidemiological situation worldwide. Introduced rules for prevention of SARS-CoV-2 spreading have exerted an impact on other contagious diseases too. Weigh profile of infections prior to COVID-19 era against time of SARS-CoV-2 pandemic constituted the objective of our research.
Aim of the study (orginal work): To answer a question regarding differences in the prevalence of infections among patients treated in Haematology Department before and after the outbreak of COVID-19 pandemic.
Material and methods (original work): This research represents a retrospective analysis of patients' population treated in our setting from March to May 2019 in comparison with analogous period in 2020. Patient characteristics as well as data about contagious diseases, fever and inflammatory markers were collected via hospital information system.
Results (orginal work & case report): We analysed 109 admissions (96 patients) in March-May 2019 and 121 hospitalisations (83 individuals) in spring 2020 which occurred in our Clinic. Enterococcus faecalis was predominantly isolated microorganism in 2019, while Escherichia coli was the most frequent pathogen in 2020. Fever was less common during the pandemic than prior to its outbreak (21% and 30% hospital stays, respectively, p=0,09). Duration of high temperature episodes was similar (median: 2 days in 2019 and 1 day in 2020). In both years symptomatic infections usually affected the respiratory system (2019: 6% stays in the ward, 2020: 5%) and urinary tract (2019: 3% admissions to hospital, 2020: 2%). In 2019, the mean value of C-reactive protein and procalcitonin on the first day of fever was 120 and 4,51, respectively. In the following year, concentration of these acute-phase proteins at the beginning of high temperature episode was 112 for C-reactive protein and 3,88 for procalcitonin.
Conclusions (orginal work & case report): In 2020 we recorded fewer fever episodes (p=0,09) and slightly lower levels of inflammation parameters (unsignificant). Despite these observations, the number of cases suffered from contagious diseases was comparable between both years.
Key words (orginal work & case report): COVID-19, SARS-CoV-2, pandemic, infections, contagious diseases

Electromagnetics in Biology and Medicine

Jury:

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List of papers

Immunomodulatory role of Alternating Magnetic Field on Jurkat Lymphocytes

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Trustee: Julita Kulbacka, Assistant Professor, MD, PhD

Introduction: Modulation of membrane antigens by the physical methods is currently an interesting attempt both in immunology and oncology. Magnetic field remains a novel approach in the therapy of cancer via its combination with ferromagnetic compounds, that act as the magneto-sensitizers in the therapy. Magnetic field also affects, the metalloenzymes and thus may be used to modulate the traits of the cells.
Aim of the study: The aim of this study is to evaluate the potential of alternating magnetic field (AMF) in the activation of Jurkat lymphocytes.
Material and methods: In the study we treated the Jurkat lymphocytes with 10 mT alternating magnetic field for 30 minutes and afterwards we assessed the immunophenotype of the cells via flow cytometry studies. Next, we performed the viability tests and simulated the conditions of magnetic field treatment.
Results: We tested the CD69 and CD154 activation markers and compared that with the expression of CD95 following the treatment with 10 mT alternating magnetic field for 30 minutes. Besides, we tested the costimulatory antigen CD7 and CD25 receptor of interleukin 2 on membrane of Jurkat lymphocytes. Finally, we examined the adhesion molecules CD61 and CD162 by the flow cytometry studies. Proliferation of the cells, ATP content and the expression of MMP-2 was evaluated as well. Before the experiments we optimized the conditions of AMF treatment to avoid heating and affect the cells only with the alternating electric field. The study revealed that Jurkat cells may be activated with the magnetic field and overexpress the CD69 and CD154 molecules. Besides, CD95 and CD25 expression were elevated as the result of MMP-2 function. The expression of CD61 integrin was decreased. CD162 and CD7 molecules did not change the expression.
Conclusions: We propose a mechanism in which the AMF interferes with the metalloproteinases, which affects the expression of membrane antigens regulated by them. The method of AMF treatment for the activation of lymphocytes seems promising and more research should be done in this field.
Keywords: Alternating magnetic field, Lymphocytes, Jurkat, Immunophenotype

The influence of radiofrequency electromagnetic field on health – primary care physicians' perspective

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Trustee: Artur Kacprzyk MD, Grzegorz Tatoń MD, PhD

Introduction: Growing numbers of electronic and communication devices in use may be perceived as a potential health hazard, especially in the aspect of a constant exposure to radiofrequency electromagnetic field (RF-EMF). Some patients claim to suffer from non-specific physical symptoms, which they attribute to the exposure to RF-EMF.
Aim of the study: To assess the knowledge and beliefs of primary care physicians concerning the impact of RF-EMF on health. The frequency of visits due to the occurrence of symptoms attributed to the exposure to electromagnetic radiation were estimated. Additionally symptoms reported by these patients and sources of RF-EMF perceived as triggering factors were also assessed.
Material and methods: We conducted a survey study using Google questionnaire among primary care physicians. The survey was addressed to physicians currently practicing in primary health care units. The questionnaire consisted of 15 questions regarding basic information about interviewee's work experience, place of work, knowledge about influence of RF-EMF on health and frequency of admissions of patients who supper from symptoms attributed to RF-EMF.
Results: Most interviewees declared that they have visits of patients due to mentioned ailments at least once a year, although some of the physicians did not have any patient with such symptoms. Reported symptoms were usually unspecific and included most commonly headache, fatigue, somnolence, difficulty concentrating and anxiety. Devices pointed as triggering the symptoms were mobile phones, tablets and mobile phone base stations. Most responders were convinced that Poland-wide awareness-raising programs about the influence of RF-EMF on health should be implemented.
Conclusions: Based on the answers of primary care physicians we can conclude that there is some number of patients complaining of the symptoms attributed to everyday exposure to RF-EMF, however this phenomenon is relatively rare in the Polish community. Patients usually report non-specific symptoms such as headache or fatigue.
Keywords: electromagnetic fields, electromagnetic waves, radiation

Students' perspective on electronic devices and their potential health impact: two years ago and now

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Introduction: Despite wide usage of electronics in modern societies their impact on health still remains the subject of debate, especially in the context of recently implemented 5G network. Some individuals complain of a variety of nonspecific physical symptoms, which in their opinion are attributed to exposure to electromagnetic field (EF).
Aim of the study: To analyze the knowledge about the influence of EF originating from devices of everyday use and the changes that have occurred in the last two years, since the wide introduction of the 5G network in Poland.
Material and methods: We conducted a prospective study with the use of a 22-element questionnaire accessible through the Google platform. The questions concerned the demographic data of the respondents, their experience and knowledge in the field of (bio)physics, their attitude towards EF emitting devices and the potential health consequences of their use. The survey was addressed to students of both medical and nonmedical faculties. We excluded responses from graduates and incomplete answers. The questionnaire was conducted in two time periods: between February/March 2020 and March 2022. The responses from both years were analyzed and compared.
Results: We analyze the responses of 232 respondents from 2020 and 60 from 2022. In 2022, students assessed their knowledge of the impact of electromagnetic radiation on health higher compared to 2020 (rated on a scale of 1-5, in 2020 average 2,46 compared to 2,65 in 2022). Compared to the results of the survey from two years ago, students less frequently declared that electronic devices affect human health: 73,3% in 2022 compared to 76,8% in 2020 declared negative impact and 23,3% in 2022 compared to 21,9% in 2020 declared no impact ($p<0,001$). The type of electromagnetic waves which was indicated as influencing well-being in 2020 students most often indicated ionizing radiation (40.7% of responses) however in 2022 student most often indicated acoustic waves, infra- and ultrasounds (40% of responses).
Conclusions: Two years after the introduction of the 5G network, the number of students who believed that electromagnetic radiation emitted by everyday devices had a negative impact on health decreased.
Keywords: Radiation, electromagnetic fields, electromagnetic hypersensivity

The SAR value in MRI examinations as an aspect of patient safety – case report of pelvis MRI

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Background: The electroradiologist conducting the MRI examination watches over the quality of the examination and is aware of the consequences of his actions. The SAR (ang. Specific Absorption Rate) value in MRI studies is one of the aspects of patient safety during the study. Raising and overheating the patient's body during the MRI examination is the foundation for the safe conduct of the MRI examination. The SAR coefficient and its limit values in MRI tests ensure the safe conduct of an MRI test. Knowing the factors influencing its value in pelvic MRI examination is connected with practical tips for an electroradiologist that will lower the SAR value in MRI examinations.
Case report: A 61-year-old patient reported to the Magnetic Resonance Imaging Unit of the University Hospital in Krakow in October 2020 for a control MRI examination of the pelvis. The patient's medical records confirmed rectal cancer with suspected concomitant prostate cancer. The examination was performed on the Siemens MRI 3T apparatus using an abdominal examination coil. During the test, the permissible value of the SAR coefficient was exceeded. In order to complete the examination, the electroradiologist had to use methods that lower the SAR coefficient value.
Conclusions: The electroradiologist constantly supervises the quality of the MR examination during the MR examination. The reduction of the SAR coefficient in MR studies involves limiting the use of MR sequences that increase the value of this coefficient. Good thermal and electrical conductivity, such as blood or urine causes them to heat up faster, which results in an increase in the SAR coefficient in the MR test. Each MRI examination should be personalized by trained personnel, according to the requirements of a particular patient.
Keywords: magnetic resonance imaging, Specific Absorption Rate, SAR coefficient, safety

Forensic Medicine

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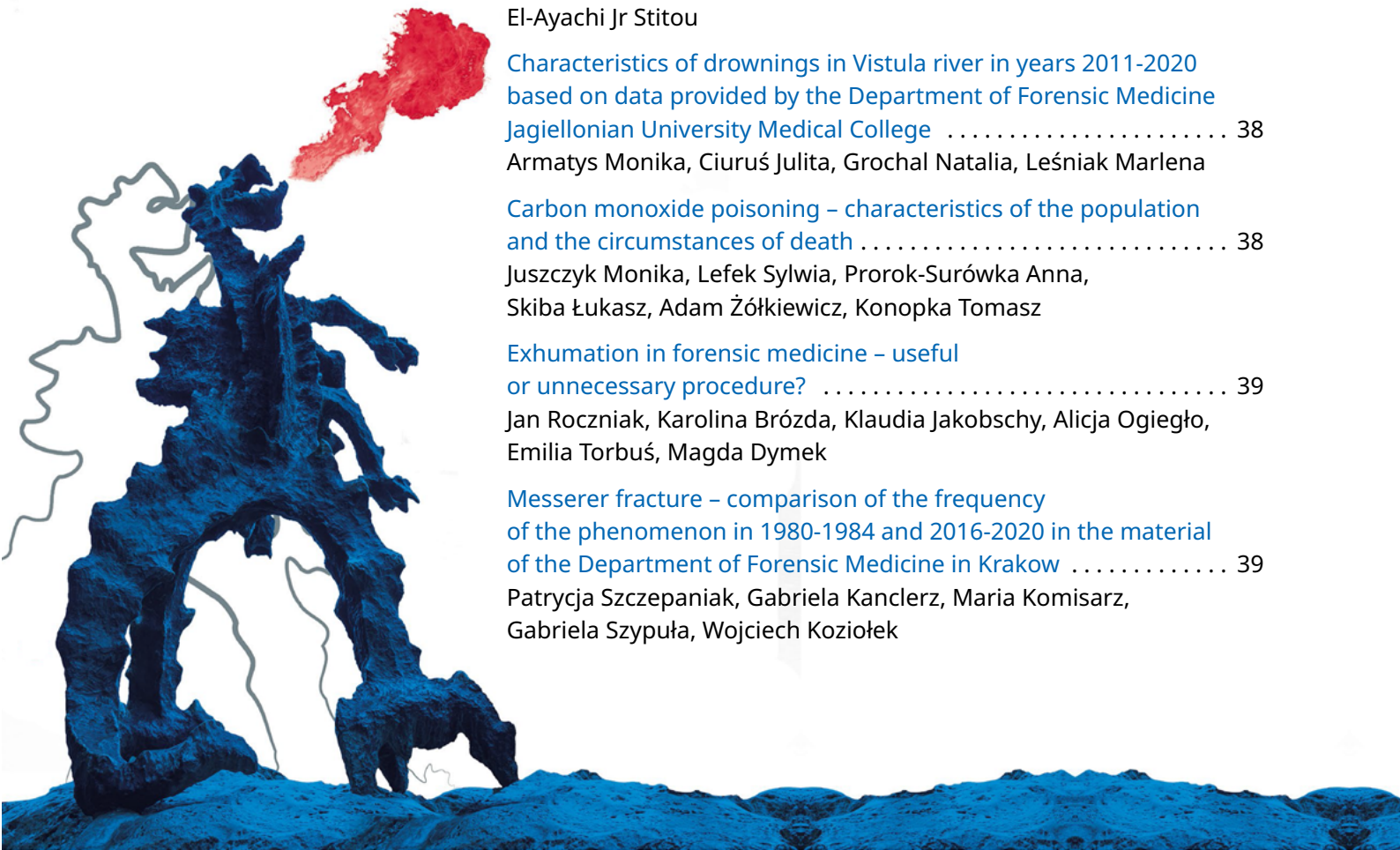

The analysis of gunshot wounds of cursed soldiers

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Trustee: Tomasz Konopka, Associate Professor, MD, PhD

Introduction: According to a document from 1946, the execution of a person sentenced to death by shooting was to consist of firing into the heart of the convict. Based on these guidelines, during forensic examination of the exhumed bone remains, several gunshot injuries to the torso (especially to the chest) should be expected. However, most of the bodies of the cursed soldiers analyzed in the Department of Forensic Medicine in Cracow contained bullet holes in the bones of the skull.
Aim of the study: The study aimed to characterize the gunshot wounds of cursed soldiers.
Material and methods: Retrospective analysis of autopsy protocols of cursed soldiers from the Department of Forensic Medicine in Cracow in the years 2017-2020 was conducted. After finding cases with gunshot wounds we further analyzed the bullet inlet and outlet.
Results: After excluding subjects that did not meet our requirements, we obtained 31 cases in total. Based on the number of gunshot wounds to the head, we documented 16 skulls with a single, 5 with two, and 3 with four or five gunshot wounds. We also searched for remains with injuries in other locations, and so we documented cases with additional gunshot wounds in the area of the scapula, pelvis, ribs, tibia, and humerus.
Conclusions: In most cases, the deaths of cursed soldiers were due to craniocerebral injuries sustained by gunshots. Based on the reconstruction of the bullet track, the majority of skulls had an inlet in the area of the occipital bone, which indicates that the death penalty executors did not comply with the guidelines for its execution.
Keywords: cursed soldiers, gunshot wounds, bullet track, forensic medicine

Blood alcohol content in fatalities of road traffic accidents in years 2015-2020 based on autopsy data from the Department of Forensic Medicine, Jagiellonian University Medical College, Cracow

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Introduction: Drinking is a known risk factor of causing a road traffic accident, so it is important to monitor incidence of insobriety amid fatal victims.
Aim of the study: The aim of the study was to check how the blood alcohol content in victims of road traffic accidents differ in various populations – pedestrians, drivers, motorcyclists, cyclists of all age groups.
Material and methods: This retrospective study is based on collecting information from a database of the Department of Forensic Medicine in Cracow. The analysis included post–mortem blood alcohol measurements in people involved in accidents between 2015 and 2020, such as car drivers, motor vehicle drivers, cyclists and pedestrians. Additional information included age and gender of the victims.
Results: There were 582 cases of fatalities of road accidents in the region covered by the data in the 2015-2020 period of time. Men accounted for 81,6% of cases. The most common group were pedestrians who accounted for 51,2% of all cases, then drivers (28,4%), motorcyclists (14,1%) and cyclists (6,4%). There were 249 (42,8%) not sober (more than 0,0‰ blood alcohol level) cases. Among inebriated individuals median blood alcohol content was higher in men (2,2) than women (1,5). Median blood alcohol level was the highest among the 51-70 age group (2,4), then 31-50 (2,3), 18-30 (1,8) and 70+ years old (1,05). When it comes to the median blood alcohol content among different road user groups the highest levels were found in pedestrians (2,3), then among cyclists (2,15), drivers (1,9) and motorcyclists (1,55).
Conclusions: Collected data showed that there is a statistically significant difference in insobriety within all defined subgroups. Among not sober cases, there was a significant difference between men and women involved in fatal road accidents. There is also a statistically relevant difference between age groups in inebriated individuals, where the middle aged have higher blood alcohol content. Inebriated pedestrians had statistically higher blood alcohol levels than motorcyclists, but there were no other significant differences in vehicle groups.
Keywords: alcohol consumption, blood alcohol content, fatalities, road accidents

Location and characteristics of wounds in homicide cases committed with use of an axe

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Introduction: Nowadays, the most common method of committing a homicide in Poland is the use of a dangerous tool, for example a melee weapon. Yearly there are still some cases of murder with an axe, characterized by a distinctive pattern of wounds inflicted to the deceased.
Aim of the study: The aim of the study was to analyze the characteristics of wounds inflicted using an axe and to identify some of their common features, which may suggest that the analyzed case is homicide.
Material and methods: Data from the autopsy books of 2008-2021 were analyzed and cases of homicide with the use of an axe were selected. Moreover, data concerning the quantity and location of the wounds, sex, age and ethanol blood concentration of the deceased during the incident were gathered.

Results: 29 cases of homicide were analyzed. Chop wounds were present in 37,9% cases, bruised wounds in 41,3% cases, and both types of wounds were present in 17,2% cases. The head was the most frequent location of wounds (82,7%). Fractures of skull bones were present in 58,6% of analyzed cases. The wounds were most often located in one area. Quantity varied from a single wound to several dozen. In the majority of cases there were less than 5 wounds present (55,1%). Defense wounds in the palm area were present in 27,6% cases. The appearance of wounds, depending on their depth can be characterized as shallow, crescent-shaped incisions, oval deep wounds, and ragged, irregularly shaped ones. Body part amputation was present in 20,7% of the examined cases.
Conclusions: In analyzed cases of murder using an axe, the most characteristic are wounds located in the head area, with corresponding fractures of skull bones, sometimes with coexisting defense wounds in the palm area. The perpetrators use both the blade and the poll side with similar frequency, rarely changing the method of impact.
Keywords: homicide, axe, chop wounds, bruised wounds

Characteristics of drownings in Vistula river in years 2011-2020 based on data provided by the Department of Forensic Medicine Jagiellonian University Medical College

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Introduction: Drowning is defined as a process of experiencing respiratory impairment from submersion/immersion in a liquid medium. Its postmortem diagnosis is often based on exclusion of other potential causes. Some autopsy findings are helpful in making faster and more accurate interpretations.
Aim of the study: This study aims to identify characteristics of fatal drowning cases in Vistula river and their dependence on pre-mortem and post-mortem factors.
Material and methods: The data (demographic information, place of discovery, findings during post-mortem examination) was provided by the Department of Forensic Medicine in Cracow and acquired from autopsy reports (2011-2020). 88 cases (61 men and 26 women who died aged 19-82) of drowning in the Vistula were reported.
Results: In 88 cases males are the prevalent group (69.3% vs 29.5%). Mean age was 43.8 (19-72;SD=16.9). The majority of uncovered casualties were found between Kosciuszko's and Dabie's water stages (48;54.5%). Causes of death were: unknown (69;78%), suicide (14;15.9%), accident (5;5.7%). 32 sections (42.1%) confirmed alcohol level above 1‰. Statistically males were more often inebriated (28; 45.9% vs 4; 15.4%;p=0.0069 test chi2). Putrefaction was reported in 44 cases (50%), whereas emphysema aquosum in 60(68.2%). The number of emphysema decreases in decomposed bodies (54.5% vs 81.8%,p=0,006 test chi2). Injuries were mostly superficial (32;36.4%); 6(6.2%) fractures of: spine, nasal bones, ribs and 9(10.2%) due to reanimation; 1(1.1%) internal injury of spinal cord.
Conclusions: Most cases are localized in the central Cracow, although the bodies were also addressed from adjoining counties along the Vistula river. High percentage of men in a state of inebriation suggests that accident was a predominant cause of death in this group. Emphysema aquosum was significantly more common in non-putrefied remains. It points that this sign can be a valuable hint that drowning was a cause of death.
Keywords: drowning, Vistula, emphysema aquosum, putrefaction, forensic medicine, alcohol

Carbon monoxide poisoning – characteristics of the population and the circumstances of death

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Introduction: CO intoxication is a frequent cause of hospitalization and death in the Polish population. Fatal poisoning may occur accidentally, mainly during the heating season, or intentionally for suicide purposes.
Aim of the study: Determination of the size of the phenomenon of fatal CO poisoning and analysis of the circumstances in which it occurs.
Material and methods: Analysis of material from autopsies performed at the Department of Forensic Medicine, Collegium Medicum of the Jagiellonian University, in 2006-2017.
Results: There were 251 cases of people with CO poisoning and blood HbCO measurements above or equal to 40%. Men accounted for 69% of all cases; women accounted for 31%. Female deaths were most common in the 70-90 age group and accounted for 35% of all deaths among women, with men most common in the 50-70 age group (41% of all deaths). 15% of women and 58% of men had more than 0.5‰ of alcohol in their blood. Death in fires accounts in 44% of cases, men died more often and responded to 72%, women accounted for 26%. Suicide was committed by 12% of men and no women in the garage.
Conclusions: Death from CO poisoning is still a significant problem. Our case study shows a relatively constant death rate, with a slight downward trend in recent years. Taking into account gender, men die more often. In relation to the female sex, fatal intoxication more frequently coexists with exceeded alcohol levels, both above 0.5 ‰ and above 1 ‰. CO suicides occur onlym among males and are mostly committed in a garage using a car's exhaust pipe connected to the cabin. In comparison to the data from 1968, there are now significantly fewer suicides.
Keywords: carbon monoxide poisoning; death;

Exhumation in forensic medicine – useful or unnecessary procedure?

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Introduction: Body exhumation is defined as the taking of the body out of the grave in order to be inspected or opened. In forensic medicine exhumation bodies are performed rare. The most common indication for an exhumation is disclosure of new circumstances regarding the death, indicating the suspicion that it occurred in a criminal manner, especially when a post-mortem examination has not been performed before the burial.
Aim of the study: Assessment of whether the known primary cause of death changes after dissection of the exhumed body and whether dissections of the exhumed bodies are a significant diagnostic test.
Material and methods: 35 exhumations from the period 2000-2020 were selected. Then postmortem reports were analyzed to determine whether exhumation provided useful information. Degree of the body decomposition was assessed using a proprietary 6-degree scale.
Results: 32 of the analyzed cases were actual autopsies. Three other cases were exhumations performed to take DNA samples. Exhumations provided useful information in 38.23% of the cases. Usefulness of the autopsy was correlated with the degree of body decomposition (p=0.031). Internal organ structure was maintained up to 14 days (Q1-Q3 = 13-15). Skin integrity was maintained averagely up to 151 days (Q1-Q3 = 102-217), allowing the skin marks investigation. Older remains allowed only general assessment of major pre-mortem injuries. Exhumation provided new information more commonly when autopsy wasn't performed before, however the result wasn't statistically significant (56.25% vs 26.67%, p=0.095) In of the cases, exhumation of bones 6 years after the burial allowed toxicological examination which revealed benzodiazepine metabolites, therefore proving a suspicion of poisoning.
Conclusions: Exhumation can be useful mostly in regard to recently buried bodies. If an autopsy was performed before the burial, the exhumation can rarely provide new information. Exhumation of bones allows to detect metabolites of medicines, which can be useful in the cases of poisoning.
Keywords: exhumation, autopsy, postmortem examination

Messerer fracture – comparison of the frequency of the phenomenon in 1980-1984 and 2016-2020 in the material of the Department of Forensic Medicine in Krakow

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Introduction: The Messerer fracture is one of the fractures occurring in car-pedestrian traffic accidents. It is characterized by the formation of an intermediate wedge-shaped or triangular fracture and mainly affects the shafts of long bones, especially the shin. According to the newest literature, in recent years there has been a decrease, caused by the change of cars' bumpers shape, in the frequency of these fractures.
Aim of the study: To compare the incidence of the Messerer fractures in the years 1980-1984 and 2016-2020 in the material of the Department of Forensic Medicine in Krakow and to equate with the available literature.
Material and methods: Section protocols collected at the Department of Forensic Medicine in Krakow from 1980-1984 and 2016-2020 were investigated. Cases with car-pedestrian traffic accidents were gathered and analyzed.
Results: In the 39 cases from 1980-1984, 47 Messerer fractures were present. These reports accounted for 8.35% of deaths related to car-pedestrian traffic accidents. Among 9 women, the Messerer fracture was usually observed in the right femur (41.67%), and the base of the wedge was lateral (41.67%). Whereas among 30 men, it was mainly located in the right femur or tibia (25.71% each). Alcohol was detected among 17 people. While in the 34 postmortem reports from 2016-2020 (15.38% of fatal strikes by a car), 43 Messerer fractures were present. They were usually located in the right tibia (39.5%), then the right fibula (20.9%) and the left tibia (14%). The bases of the wedges were mostly lateral (51.2%) and anterior (14%). In the contemporary protocols alcohol was detected among 22 people.
Conclusions: Contrary to the literature data Messerer fractures occur in modern times almost twice as often as in the 80's. Some differences regarding localization in lower extremities or wedge orientation can be observed.
Keywords: Messerer fracture, traffic accident, fracture, pedestrian victims

Histopathological changes of heart and liver after fatal narcotic drugs overdose – retrospective analysis

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Introduction: Fatal overdose of narcotics can lead to death caused by organ failure. Drugs can adversely affect the human body in different ways depending on their group.
Aim of the study: The aim of the study was to investigate whether lethal narcotic poisoning causes characteristic histopathological changes in heart and liver tissue compared to the control group.
Material and methods: Basing on toxicology reports from 2018-2021, 25 cases of fatal narcotic poisoning were selected. Data from autopsy protocols from the Department of Forensic Medicine, Cracow were gathered. Subsequently, we searched for cases of people deceased at age 20 to 40 due to trauma to compose a control group (23 cases). We analyzed histopathological changes in cardiac and liver tissues.
Results: The cardiac tissue hyperaemia occurred in 23 cases (92%), 16 of them were opioid poisoning, nonhomogeneous fiber stainability in 6 cases (24%), 5 of them caused by opioid poisoning and stromal oedema in 11 cases (44%). In control group it was 10 (43%), 7 (30%) and 14 cases (61%) respectively. In the liver tissue steatosis occurred in 14 cases (56%), 10 of them in opioid poisoning and hyperaemia in 18 cases (72 %). It was respectively 17 cases (74%) and 3 (13%) in control group.
Conclusions: The study has shown that any drug use is related to increased chance of liver and heart hyperaemia. Among the studied drugs opioids are linked to higher rate of nonhomogeneous fiber stainability and hepatosteatosis. Since hepatosteatosis is more related to opioids than other drugs compared in the samples, it may suggest that opioids are more likely chosen by people with the history of alcohol abuse. However, as it is a small sample research, studies with larger sample size should be conducted to increase validity of the results.
Keywords: drug overdose, opioids, histopathology, heart, liver

„By horn and hoof" – animal-related events in the sectional material of Krakow Forensic Medicine Department

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Introduction: Animal-related deaths account for a small amount of violent deaths,placing even behind such rare occurrences as passing away due to being struck by lightning.A rather more common event involves animals scavenging on a corpse.In developed countries the aforementioned occur rarely,usually in relation to keeping livestock,farming or,seldom,encounters with wildlife.The cases are usually classified by trauma type(eg.blunt),not the animal species responsible.
Aim of the study: To assess the frequency,location,animal species involved,victims' characteristics(sex,age,alcohol intoxication,other traits),injured area,wound type and mechanism of death in animal-related events present in the sectional material of Krakow Forensic Medicine Department,-Jagiellonian University-Medical College.
Material and methods: We collected data(dissection protocols)on animal-related events from the archive of Krakow Forensic Medicine Department(years 2000-2022).The cases were divided between direct animal involvement in death and other events(eg.scavengers feeding on a corpse,animal causing a road accident).Photographic material was assessed whenever available.
Results: Our investigation revealed 52 animal-related events (including 18 deaths directly caused by animals,2 indirectly and 32 cases of corpse scavenging).Their occurence reduced with passing years (linear regression,p=0,0259).Animal-related deaths happened more often in rural setting (χ^2-2side. Fisher,p=0,01688, R.Spearman=0,371).No association of victims' sex,age,alcohol intoxication with event lethality and wounded area was found (U Mann-Whitney, χ^2-2side.Fisher,p>0,05).Horses (7 cases) and dogs (4 cases) were the most common death causes; dogs (13 cases) and vermin/rodents (6 cases) were the main causes of corpse scavenging.Several extremely rare occurrences in Polish context were noted-including one death caused by a bear.
Conclusions: Characteristic patterns of bodily injuries and wounds afflicted by specific animal species were elucidated-cattle damages lower extremities and chest(bruises,effusions,no tissue lesions), horses-the head(similar to bovines), dogs-the head,upper extremities(bone lesions) and pelvis(absence of genitals), cats-soft tissues (typically the head,broad damage), rodents-epidermis(generalised,surface damage).Several significant predictors of animal-related death and factors unrelated were defined.Basing on the circumstances of described animal-related deaths,we propose several means to mitigate their risk.
Keywords: animal-related death, corpse scavenging

Awareness of postmortem imaging among medical students

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Trustee: Prof. Krzysztof Woźniak, MD, PhD

Introduction: Among the public,the first procedure associated with forensic medicine is the dissection and everything that comes along–opening the body,prolonged time to burial,religious/ethical considerations.All the aforementioned may lead to the deceased's family being hostile towards that practice.Could postmortem imaging become an alternative?

Aim of the study: The study analyses how medical students view postmortem imaging before/after the forensic medicine clinical course.Does the class alter their stance on the subject,if so–how,taking into consideration their ethics,religion,social background and medical knowledge?
Material and methods: We used an anonymized questionnaire(23 questions).Among 86 participants in the survey there were fifty nine 4th-year students and twenty seven 6th-year students of the Faculty of Medicine,Jagiellonian University Medical College,Krakow.The questionnaires were open from 20th May to 30th June 2021 on Microsoft Forms platform and were shared via student groups on Facebook. The approval of Bioethics Committee of Jagiellonian University(decision no.1072.6120.70.2021)was obtained in May 2021.
Results: The studied groups(students before/after forensic medicine course)were homogenous regarding sex,religiosity,declared religion and residence(χ2-Pearson,Kolmogorov-Smirnov,Wald-Wolfowitz;p>0.05).Knowledge and opinion on postmortem imaging was unrelated to sex,religious affiliation,religiosity(χ2-Pearson/Fisher;p>0.05),residence(Kolmogorov-Smirnov,Wald-Wolfowitz,Mann-Whitney,Kruskall-Wallis;p>0.05)and increased after course completion(2-sided χ2-Fisher;p=0,04633).Comparatively,33.9% of fourth-year students and 85.2% of sixth-year students declare encountering this topic at university.Finishing the course did not influence students' opinion on ethicality of postmortem examinations or acceptance of procedure on a relative(χ2-Pearson/Fisher;p>0.05).Post-course students declare lesser need to educate patients on topic and to obtain family's approval of examination(χ2-Pearson;p=0,00746 and p=0,00242).Religiosity was positively associated with asking for permission(χ2-Pearson;p=0,04365)and less certainty about imaging of a relative(2-sided,χ2-Fisher;p=0,04854).
Conclusions: After completing the forensic medicine course,-students obtained skills that impacted their perception of postmortem imaging.Our study showed that,considering this topic,moral and ethical dilemmas are as important as the specific knowledge.This particular 'interplay' is not commonly discussed,even in academic society.However,the situation above could change if postmortem imaging was included in study syllabi or mentioned by lecturers from other fields of medicine.
Keywords: medical students, forensic medicine, postmortem imaging, ethical dilemmas

Frequency of main characteristics of manual strangulation

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Trustee: Tomasz Konopka, Associate Professor, MD, PhD

Introduction: Manual strangulation is a type of asphyxial death where the perpetrator uses his hands, arm or foot to encircle and compress the front and side of the neck. In the data obtained from the Department of Forensic Medicine of Jagiellonian University in Cracow, it occurs with an average frequency of one case a year. Unfortunately, this type of death is very difficult to ascertain due to the slenderness of scathes among some of the victims.
Aim of the study: The aim of the study was to assess the frequency of occurrence of main manual strangulation characteristics present in the autopsy like conjunctival petechiae, ecchymosis in the neck or fracture of the laryngeal bone scaffold.
Material and methods: Retrospective analysis of thirty-one autopsy protocols of deaths from manual strangulation from the Department of Forensic Medicine in Cracow in the years 1982–2020 was conducted. The exclusion criteria were decomposition of the cadavers or questionable direct mechanism of death.
Results: In the years 1982-2020 there were 31 cases of deaths from manual strangulation, 19 of which were women and 12 men. Out of 31 cases, 18 had detectable alcohol content in the bloodstream or urine. Petechiae in the conjunctiva was present in each of the cases, ecchymosis in the neck in 30 cases, fractures of the laryngeal cartilages and hyoid bone in 16 cases, where in the superior cornu of the thyroid cartilage is he most frequent one.
Conclusions: Conjunctival petechiae and ecchymosis in the neck are significant and peculiar features of manual strangulation. The most typical are fractures of the hyoid bone and laryngeal cartilages – the superior cornu of thyroid cartilage in most cases. It may not occur at all in children, and it rarely was reported in adolescents. Cases without increased alcohol content had more facial injuries, fractures and ecchymosis on face and neck.
Keywords: manual strangulation, autopsy, murders, forensic medicine

Analysis of events of the night from 1946 to 1947 in Zelczyna, Malopolskie

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Introduction: Some of the events concerning various killings in Polish history to this day remain unclear. Even though there were some historical studies done about the shootings we describe, there still remained the forensic side to verify. By doing so we have uncovered facts that change our view of that night established previously by various documents and historical articles, which all described deaths of the victims as executions.
Aim of the study: Verifying circumstances of deaths that occured during the shootings in and near Zelczyna, 1946/47
Material and methods: 6 autopsy protocols and archival documents from 1947 were analysed to compare official course of events with results of autopsies.
Results: Around midnight 31.12.1946/01.01.1947 a group of several armed men, later established to be anti-communist partisans, lanuched two attacks on local militia men (ORMO) in and aroud the village of Zelczyna, killing 6 people. Some

of the victims were found near railroad tracks, others were killed in front of witnesses on a party taking place in a local school. Firearms used were not identified in the autopsy reports due to lack of cartridges in the bodies. Autopsy protocols show the victims were shot in random places on the bodies, which would not indicate the killings to be executions as described in earlier reports, but as deaths in action, with the exception of perhaps one victim. Those same reports also contained inaccuracies regarding names and number of the victms.

Conclusions: The reports said that the victims were made to lay down on the ground in prone position. Later shots were supposed to be fired from behind. Autopsy results do not confirm this description of events, with only one of the victims showing signs which could suggest execution. All the other victims, judging by their wounds were likely killed in action.

Keywords: shooting, autopsy, cursed soldiers, partisans, executions

Internal Medicine

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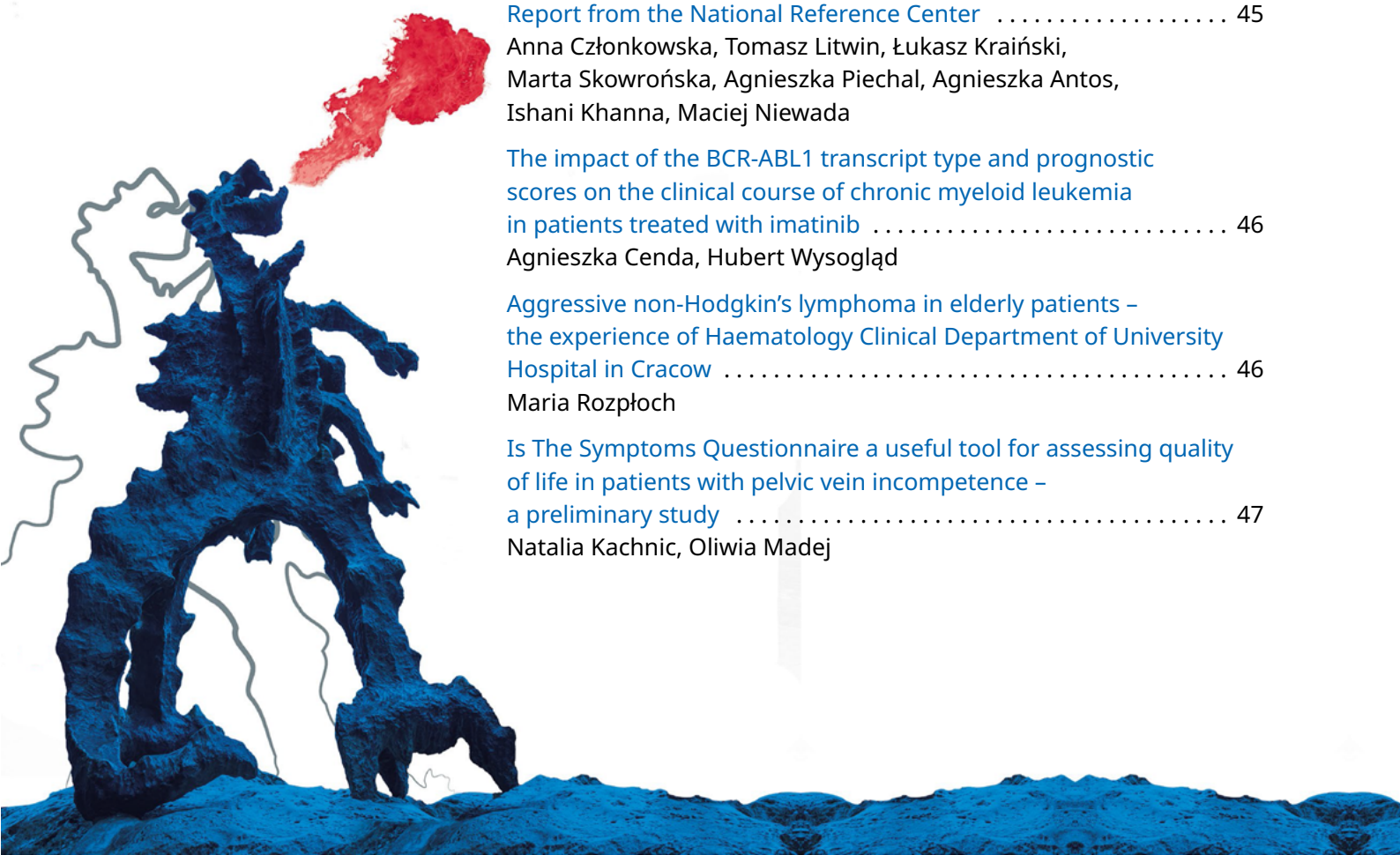

Treatment difficulties symptoms in patients suffering from Henoch-Schoenlein purpura as a multisystem disease

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Trustee: Halina Hałpiec-Szczęsna, MD, PhD

Introduction: Henoch-Schoenlein purpura (HSP) is a disease entity that occurs relatively rarely. The condition is associated with inflammation of capillaries in organs mainly due to the skin lesions, it appeals to about 90% of cases – in the form of a hemorrhagic rash and in addition kidneys and brain. The vessels affected by inflammation have a relatively weaker wall in terms of structure and continuity, which is associated with increased permeability to vascular bed components.
Aim of the study: The aim of this work is to discuss the treatment and pathogenesisof purpura, drug therapies, and to outline the problems associated with such systems as genitourinary and nervous, with particular attention to changes in the largest organ of the human body – the skin.
Material and methods: All information about the causes, course, symptoms, as well as treatment and effects of Schonlein-Henoch's Purpura mentioned above, was taken from medical research websites: Pubmed, Mendeley etc.
Results: HSP can affect anyone, but it is most common in children under the age of 10. The condition usually improves on its own as evidenced by the fading petechiae occurring in the lower parts of the body that are a typical symptom of this condition. Medical care is necessary when the disorder affects the kidneys and, in more serious cases, the nervous system.
Conclusions: Often associated with viral infections as indicated by frequent temporal association. There is also a connection between the occurrence of vasculitis associated with IgA antibodies and disease entities such as inflammatory bowel disease and ankylosing spondylitis.
Keywords: Henoch-Schoenlein purpura, inflammation, multisystem disease, capilares, treatment difficulties

The influence of leukotrienes, as a biomarker of vascular inflammatory process, on the quality of life in patients with symptomatic peripheral arterial disease

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Trustee: Prof. Paweł Maga, MD, PhD

Introduction: Atherosclerosis is an inflammatory disease and the most common cause of peripheral arterial disease of the lower limbs. It causes a reduction in blood flow leading to ischemia early manifesting as intermittent claudication or even resting pains, reducing patients' quality of life.
Aim of the study: The aim of the study was to compare changes in Leukotriene E4 (LTE4) levels as an inflammatory mediator associated with atherosclerosis and changes in patients' quality of life before and after percutaneous transluminal angioplasty (PTA).
Material and methods: 108 patients who underwent PTA were enrolled into this prospective observational study. LTE4 was assessed in urine with ELISA kits. VascuQol disease specific scale was used to estimate the patients' quality of life. The results were assessed at baseline, as well as 1, 3, 6, 12 months and 8 years after the procedure. All correlations are computed as Pearson's r.
Results: The negative predictors of VascuQol (preoperative, 1, 3, 6 and 12 months) were the corresponding LTE4 values for these time points. Furthermore preoperative LTE4 was a negative predictor of quality of life in all examined points over a year (Pearson's correlation for VascuQol sum at 1st month after surgery was -0.25; in 3rd month -0.26; in 6th month -0.23; in 12th month -0.22 with predictive value for all $p < 0.05$).
Conclusions: The correlation between LTE4 values and patients' quality of life leads to reflection on the role of vascular inflammation in the process of patients healing and recovery after endovascular treatment and whether LTE4 could be used to monitor this process.
Keywords: atherosclerosis, leukotrienes, quality of life, endovascular treatment, peripheral artery disease, revascularization

Long Term Follow-Up of Wilson Disease Patients in Poland – Report from the National Reference Center

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Introduction: Wilson's Disease (WD) is a rare disorder causing excessive copper deposition. Patients present with a spectrum of clinical manifestations, mostly neurological and hepatic symptoms. A number of therapeutic options, including penicillamine and zinc salts, have been established to successfully treat WD. Delayed diagnosis and poor compliance with medications are associated with poor prognosis.
Aim of the study: We report seven decades of clinical experience with WD patients admitted to a one-in-country reference center, which provided long-term care to the majority of adult patients in Poland.
Material and methods: Electronic prospective data collection began in the end of 1990s and for patients from prior years, we analyzed their medical records retrospectively. We

grouped patients by decades of diagnosis and analyzed the evolution of demographic and clinical characteristics, treatment implemented, outcomes and selected diagnostic methods. We used chi-square or Kruskal-Wallis tests and ANOVA to compare trends over decades. WD patients' overall life expectancy was explored using the mean death age compared to the general population. Kaplan-Maier curves were used for a time-to-death analysis and HR was calculated for decades using 2000-2009 as a reference.
Results: Our study presents 929 patients from seven decades. The number of WD patients diagnosed increased exponentially between 1960 and the 2000s. Prior to the 90s, mostly males were treated but the number of females diagnosed began to increase afterwards. Initially, WD patients usually presented with neurological manifestations; however, the incidence of less severe hepatic manifestations and asymptomatic presentations increased. Less Kayser-Flescher rings were detected. Prior to 1970, patients were treated with penicillamine. Since the introduction of zinc, both medicines have been used equally Switches between penicillamine and zinc were recorded in 7% of patients. The Kaplan-Meier analysis showed consistent improval in survival.
Conclusions: This is the largest cohort of patients with Wilson's Disease reported in Poland with the longest follow-up. Patients' prognosis improved over the decades.
Keywords: Wilson's Disease, Follow-Up, Mortality, Population, Inherited Liver Disease

The impact of the BCR-ABL1 transcript type and prognostic scores on the clinical course of chronic myeloid leukemia in patients treated with imatinib

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Introduction: Chronic myeloid leukemia (CML) is characterized by the presence of BCR-ABL1 oncogene and related tyrosine kinase. Imatinib mesylate (IM) is a potent, selective tyrosine kinase inhibitor, the mainstay of the first-line treatment for CML. The impact of the BCR-ABL1 transcript type on the clinical course of CML remains a matter of controversy. Four prognostic scores are used to determine the outcome of patients suffering from CML; however, ELTS is the only one created in the era of treatment with tyrosine kinase inhibitors.
Aim of the study: We sought to investigate the impact of the BCR-ABL1 transcript type on the clinical outcome of patients with CML during therapy with imatinib at our Department and correlate it with prognostic scores (Sokal, EURO, EUTOS, ELTS).
Material and methods: We performed a long-term retrospective single-center analysis of 267 CP-CML pts treated with imatinib between 2001 and 2020. The BCR-ABL1 transcript type was analyzed using RT-PCR, the molecular response was assessed using the RQ-PCR method standardized according to EUTOS, and the risk scores were calculated at diagnosis of CML. Statistical analysis was performed using R software (R version 4.0.3).
Results: The median follow-up was 11.4 years. The estimated 18-year overall survival (OS) for all 267 patients was 52.1%. According to the Sokal, EURO, and ELTS scores, the OS and progression-free survival were significantly better in low-risk pts. Additionally, according to ELTS, low-risk pts had a significantly better chance of achieving deep molecular response (DMR). Patients with e14a2 BCR-ABL1 transcript type more frequently achieved DMR.
Conclusions: Our study suggests that pts harboring the e14a2 BCR-ABL1 transcript type have a better chance to achieve DMR and specific ELTS-adjusted treatment with early introduction of more potent second-generation TKIs might help to optimize the clinical outcome of CML.
Keywords: chronic myeloid leukemia; tyrosine kinase inhibitors; imatinib; prognostic scores; BCR-ABL1 transcript type

Aggressive non-Hodgkin's lymphoma in elderly patients – the experience of Haematology Clinical Department of University Hospital in Cracow

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Trustee: Agnieszka Giza, MD, PhD, Anna Krzak, MD, Justyna Jędras, MD

Introduction: The phenomenon of population ageing poses a challenge for modern medicine which is especially important, inter alia, in haematooncology owing to increased incidence of malignancies which overlaps higher multimorbidity percentage with age. The main objective of this research was the investigation of management in geriatric patients with aggressive non-Hodgkin lymphoma (NHL).
Aim of the study: Our study tried to provide an answer to a question regarding treatment efficacy and safety in the elderly who are diagnosed with aggressive NHL.
Material and methods: This research represents a retrospective analysis of 18 patients treated in our setting between 2019 and 2021. The age >75 years and histopathological confirmation of aggressive NHL constituted the inclusion criteria. Patients' data were collected via hospital information system. Descriptive statistics was used to present the results.
Results: Patients aged ≥85 years accounted for 67% of study population. The proportion of males was 56%. One-third were diagnosed with mantle cell lymphoma, the others with diffuse large B-cell lymphoma. Performance status (PS) was primarily good (ECOG ≤2 in 89% patients). Participants predominantly suffered from hypertension (50%), dyslipidaemia

(39%) and arrhythmia (22%). Most cases (89%) were eligible for treatment with curative intent. Remission was achieved in 10/18 patients. Dose reduction of doxorubicin was the main diversity in applied chemotherapy regimens comparing to standard protocols (in 7/12 individuals receiving R-CHOP). The most common adverse event was malaise (44%) followed by infection (33%). Scientific reports based on higher number of participants are necessary to determine the best way of management in age-advanced, oncohaematological patient.
Conclusions: Intensive chemotherapy is well tolerated by the elderly and improves outcome. The choice of proper treatment modality should be based on the initial evaluation of geriatric patients that include consideration of comorbidities and PS assessment. The administration of decreased doxorubicin dose is an option in individuals with cardiovascular diseases.
Keywords: Aggressive NHL, elderly patients, geriatrics, modulated chemotherapy

Is The Symptoms Questionnaire a useful tool for assessing quality of life in patients with pelvic vein incompetence – a preliminary study

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Trustee: Paulina Kłapacz MD, Prof. Paweł Maga, MD, PhD

Introduction: Chronic pelvic pain (CPP) affects almost 25% women worldwide. One of its causes is pelvic vein incompetence (PVI), which impacts about 15-20% of women's lives, yet its epidemiology and quality of life (QoL) in these patients is very poorly studied. Thus, a disease specific QoL assessing questionnaire – The Symptom Questionnaire (TSQ) – was developed.
Aim of the study: In this study we attempt to rate TSQ usability to assess QoL in the patients with PVI.
Material and methods: In this study we enrolled women admitted to Department of Angiology for endovascular treatment of PVI. They were given TSQ before the procedure, which is a 50-question form designed by a working group in University of Manchester, consisting of demographic data, EQ-5D, and questions borrowed from other gynecological QoL forms, such as International Pelvic Pain Society assessment form, Endometriosis Health Profile, VEINES-Sym (about lower limb varicose veins).
Results: 59 women (mean age = 44) answered the questionnaire. Most of the form concerns PVI in a very non-specific manner, with questions regarding general QoL, CPP, dyspareunia, dysmenorrhea etc. Within this area patients answered in line with expectations – mean self-assessed QoL on VAS scale (1-100) equaled 70, lower than Polish general population (81.4). Almost 80% respondents reported CPP and as many as 45% of the respondents complained of dyspareunia. However, 9 of the 50 (18%) questions in the form concern varicose veins of lower limb, with over 83% respondents complaining about them.
Conclusions: While some parts of TSQ might prove to be useful for assessment of QoL in patients with PVI, the questionnaire is bloated with questions irrelevant to the disease in question (such as about varicose veins, which have no correlation to PVI). Hence, a new form, more specific and tightly connected to this disorder should be developed to assess QoL in PVI patients more objectively.
Keywords: quality of life, chronic pelvic pain, pelvic vein incompetence, varicose vein, dyspareunia

Dependence between unmeasurable ankle-brachial index and quality of life in patients with lower limbs ischemia after revascularization

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Introduction: Ankle-brachial index (ABI) is a screening method used in the diagnosis of peripheral artery diseases (PAD). It is useful in assessing the efficiency of the lower extremities' arterial system. Clinicians note that sometimes ABI values are unrealistically elevated, as the highly calcified arteries does not collapse even under extreme pressure and results above 1.3 are considered as abnormal.
Aim of the study: The aim of the study was to investigate the association between "unmeasurable ABI" and quality of life (QoL) among patients with PAD.
Material and methods: In this study ABI was measured before revascularization using blind doppler detector. The VascuQol questionnaire, consisting of 6 domains, was used to assess the quality of life before angioplasty as and controlled after 30, 90, 180 and 360 days as well as after 8 years. A group of 108 patients was included in the study. The unmeasurable ABI was defined as ABI>1,3. A comparative analysis of means between the two groups (with ABI<1.3 and ABI>1.3) was used. Statistical analysis was performed using mixed-design analysis of variance (mixed-ANOVA).
Results: Mean QoL increased significantly after the procedure (0,65 vs. 0.87 in 30 days) and then remained similar (0.86 – 90 days, 0.86 – 180 days, 0.84 – 360 days). In 8-years perspective QoL decreased to 0.71. At each time point, the results of life quality in the ABI>1,3 group were lower than in the ABI <1,3 group. Groups differed from each other in a statistically significant way on time points: before revascularization ($p<0.001$), after 3 months ($p=0.013$) and after 6 months (0.028).
Conclusions: Not only lowered but also unrealistically elevated ABI values indicate potentially decreased quality of life. Preoperative unmeasurable ABI may be a predictor of poorer outcomes after revascularization in mid-term perspective.
Keywords: Ankle-brachial index, peripheral artery diseases, revascularization, quality of life, VascuQol questionnaire

From first symptoms to diagnosis – the average diagnostic delay of rheumatoid arthritis

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Trustee: Piotr Kuszmiersz, MD

Introduction: Rheumatoid arthritis (RA) is a long-term autoimmune disorder of connective tissue. Early diagnosis and treatment help slow the progression of disability, especially in the first two years of RA. Poland has one of the biggest delays when it comes to the diagnosis of RA in Europe. On average, RA gets diagnosed after 35 weeks.
Aim of the study: The aim of our study was to determine the average delay in RA diagnosis, how it is influenced by sociodemographic factors, and to evaluate the prognosis of patients depending on the length of the delay.
Material and methods: 83 randomly selected patients with RA from the outpatient department of University Hospital in Cracow were included in the study. To conduct the analysis, data from patient's medical history was used. Furthermore, to evaluate the current activity of the disease, data from the last visit was considered, including CRP, ESR and DAS28.
Results: In our patients, the average diagnosis time was 31 months, the median was 12 months. There were 78% women and 22% men, the average age was 56 years and the average BMI was 26kg/m2. The patients were divided into two groups: early diagnosed (<1 year since symptoms occurred) and late diagnosed (>1 year). Age, disease activity, and serological markers were similar in both groups. Late diagnosed patients had a higher BMI and M-HAQ score. Furthermore, patients did not differ in work absence and productivity, but late diagnosed patients had a higher decline in daily activities other than work.
Conclusions: In Poland, the time to diagnose RA still remains long. Early and late diagnosed patients were similar when it comes to disease activity and its impact on patient's work life, but late diagnosed patients reported greater pain intensity and problems with daily activities and had a higher BMI.
Keywords: rheumatoid arthritis, diagnostic delay

New Photosensitizing Compounds and Their Effectiveness in Photodynamic Therapy

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Trustee: Jakub Kuta, BSc

Introduction: Photodynamic therapy (PTD) is based upon the use of a photosensitizer, i.e., a photosensitizing compound that accumulates in pathological tissues, most often in neoplastic lesions. Photosensitizing agents absorb light of a specific wavelength and induce processes that destroy selective cells.. Research is currently being conducted on the search for new photosensitizers that modify the structure of compounds used in clinical treatment, such as protoporphyrin IX. Squamous cell carcinoma (SCC) of the skin represents approx. 20% of skin cancers. The primary etiological factor is cumulative exposure to ultraviolet radiation.
Aim of the study: The aim of the study was to verify the effectiveness of four synthetic protoporphyrin IX derivatives as photosensitizers in photodynamic therapy and to assess whether imiquimod would enhance the effectiveness of therapy in combination with the new photosensitizing compounds.
Results: The results demonstrate that the protoporphyrin IX derivatives with structural modifications are more effective in PDT than the naturally occurring protoporphyrin IX, with no increase in PDT efficacy when combined with imiquimod. Combination therapy with imiquimod does not alter the survival of healthy BJ-5ta lineage fibroblast cells. On A431 lineage cells, PDT association did not increase the cytotoxic effect.
Conclusions: Research on these compounds should be continued, and their effects on other cell lines must be determined to evaluate their potential use in the clinical treatment of squamous cell carcinoma and other diseases. The reason for the effectiveness of the combination of imiquimod with PDT should be sought in the mechanism of its induction of an immune response rather than its direct induction of apoptosis.
Keywords: PDT, photosensitizers, protoporphyrins, imiquimod, anticancerogenic therapy

Internal Medicine – Case Report

Jury:

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Coordinators:

Weronika Lebowa, Magda Dymek

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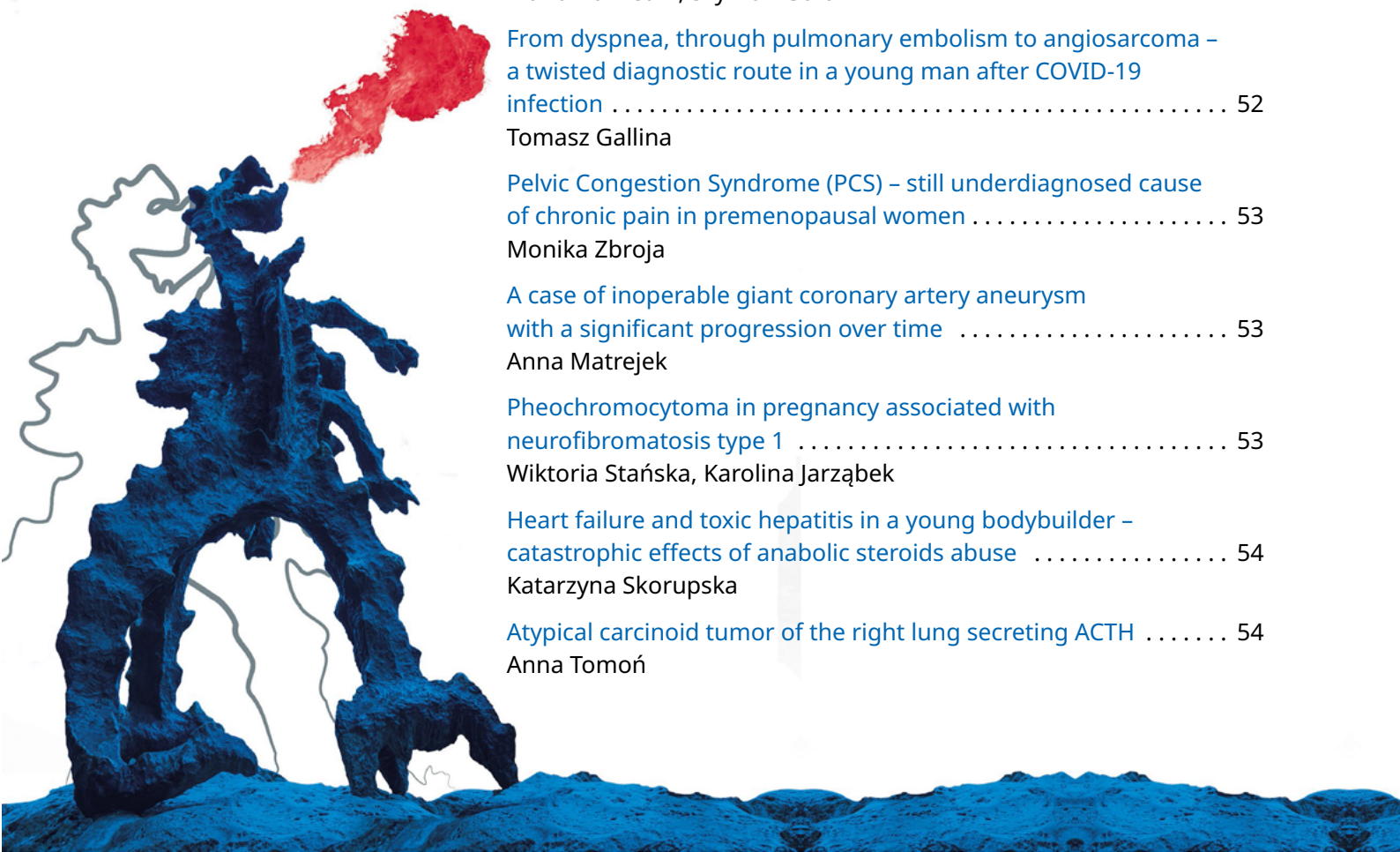

A case report of locally advanced TNBC showing a response to a paclitaxel treatment following AC-based neoadjuvant chemotherapy

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Trustee: Katarzyna Stencel, MD, PhD

Introduction: This case report presents a young patient, carrying a rare BRCA1 mutation, treated with neoadjuvant chemotherapy as a standard of care for locally advanced triple negative breast cancer. Curative surgery and adjuvant chemotherapy: capecitabine was applied to the patient.
Results: A 27-year-old woman was referred to our hospital in February 2021 due to an axillary mass found during a visit to the gynecologist and was diagnosed with right locally advanced (T2N1M0, stage IIB) triple negative breast cancer. After four courses of AC and twelve courses of paclitaxel as NAC, the following medical imaging was performed: Ultrasound: a hypoechoic solid lesion of a size of 16 x 9 mm was found in the upper outer quadrant of the right breast, dim. 16 x 9 mm – versus 20x16mm before surgery; no other focal length changes were found. There were no solid changes, such as cysts, in the left breast. Axillary cavities did not present signs of lymphadenopathy. Magnetic resonance imaging (MRI) showed a right breast mass of 13 mm diameter.
Conclusions: BIRADS 6. Right breast cancer during chemotherapy showed visible response to treatment. Histopathological examination of core needle biopsy of the tumor revealed invasive No Special Type (NST) carcinoma. No more findings of distant metastases were recognized. Patient underwent a right breast mastectomy with axillary lymph node dissection without major complications. As an adjuvant therapy, daily capecitabine treatment was initiated and significant shrinkage was immediately obtained. Patient is on capecitabine treatment from December 2021. Patient has a family history of breast and ovarian cancer. She also carries a BRCA1 mutation.
Conclusions: Mutations of the BRCA1 gene were revealed in the patient, her mother and aunt. In this case report, the combination of NAC, surgery and adjuvant chemotherapy showed significant tumor shrinkage of TNBC showing disease regression. Further observation of changes is recommended to the patient. The patient remains on capecitabine treatment from December 2021.
Keywords: BRCA mutation, Triple negative breast cancer

Optical coherence tomography-guided percutaneous coronary intervention in myocardial infarction patient. One more argument for wider use in the reimbursement era

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Trustee: Prof. Jarosław Zalewski, MD, PhD

Introduction: Optical coherence tomography (OCT) as a modern intravascular imaging technique enables high-definition visualization of coronary plaque morphology and its length as well as precise assessment of coronary artery diameter during the planning of percutaneous coronary intervention (PCI) and in the evaluation of the PCI result.
Results: We present a fifty-three-year-old man, with hypercholesterolemia and a history of smoking, who was hospitalized due to non-ST-segment elevation myocardial infarction. On the day of admission, he reported severe retrosternal chest pain radiating to the back. ECG showed negative T waves in aVL and precordial leads. Initial laboratory tests demonstrated a mildly elevated high-sensitive troponin T. The coronary angiography performed immediately after admission showed tight narrowing in the ostium of the left anterior descending artery (LAD) and a discrete and smooth contrast deficit in the distal part of the left main (LM). Baseline OCT images obtained with FastView imaging catheter revealed atherosclerotic plaque beginning in the middle part of the LM, encompassing 120 degrees in circumference and involving LM bifurcation. The lipid plaque passed from the distal LM to the proximal LAD. Directly implanted stent completely covered the whole plaque. Post-PCI OCT imaging confirmed a good apposition of the stent and widely open circumflex artery. Following PCI patient did not report chest pain and was discharged after four days.
Conclusions: OCT provided crucial information for both planning and optimization of the procedure. The preliminary data from the LightLab initiative suggest that OCT influenced PCI decision-making in as much as 88% of lesions, both pre-and post-PCI. The upcoming OCT reimbursement in Poland will undoubtedly improve the availability of this invasive imaging modality and this case report is a strong argument confirming the legitimacy of its wider use.
Keywords: optical coherence tomography, PCI, myocardial infarction

'Inside-out' – total extrusion of cardiac device following reimplantation: a case study

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Trustee: Agnieszka Olszanecka, Associate Professor, MD, PhD

Introduction: The insertion-related complications of cardiac implantable electronic devices (CIEDs) include lead dislodgement and infection, the latter found in 0.5% of patients after primary implantation and approximately 1-5% after device replacement or upgrade. In rare cases, infection of the device pocket may lead to skin erosion or total extrusion of the heart device.
Results: A 76-year-old woman was referred to the cardiology ward due to a spontaneous wound opening over the device pocket. She had her CRT-P reimplanted 2 months earlier due to battery depletion. The first CRT device was implanted seven years before. The patient's medical history comprised heart failure, chronic kidney disease, coronary artery disease, paroxysmal atrial fibrillation, arterial hypertension, hypercholesterolemia, and nicotine dependence. On physical examination, a partial extraction of the device with erythema and purulent discharge from the wound was observed. The patient was otherwise in good condition without fever, despite slightly elevated CRP. ECG showed full atrioventricular pacing. The positive result of the SARS-CoV-2 test caused postponement of CRT extraction. Due to the extreme risk of infectious endocarditis, broad-spectrum antibiotic was commenced. Meanwhile, total extraction of CRT was observed with surrounding edema and bloody effusion. When changing the wound dressing, a sudden episode of extreme bradycardia occurred necessitating the use of a temporary transvenous pacing. After recovery from SARS-CoV-2 infection, the patient underwent CRT removal, preceding contralateral insertion of a new device nine days later with a backup of a temporary pacing using permanent active fixation lead.
Conclusions: The presented case illustrates the risks associated with CIED and its maintenance. Patients and physicians should be wary of any infection occurring at the site of insertion, with infective endocarditis and device malfunction being its most serious complications. CIED pocket infection requires total removal of the old device with contralateral insertion of a new pacing system.
Keywords: CIED, infection, device malfunction

From dyspnea, through pulmonary embolism to angiosarcoma – a twisted diagnostic route in a young man after COVID-19 infection

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Introduction: An apparently healthy 31-year-old man showed a significant dyspnea which started 1 month after COVID-19 infection (in march 2021). The ambulatory diagnosis route which was conducted for 3 months, did not reveal any potential causes. When hemoptysis occurred in July 2021, he was admitted to hospital for further assessment.
Results: At admission patient presented with exercise dyspnea (NYHA II) peripheral oxygen saturation was 97%. Heart rate was 80/min. Laboratory results shown increased level of C-reactive protein and nearly-normal D-dimers level (517 µg/L; N< 500). Echocardiography showed signs of D-shaped left ventricle, significant right ventricle enlargement and its overload with estimated right ventricle systolic pressure of 68mmHg and immense masses in pulmonary trunk, balloting through pulmonary valve. Computed tomography pulmonary angiography confirmed extensive mass in pulmonary trunk and both pulmonary arteries. As initial diagnosis was pulmonary embolism with intermediate-high early mortality risk, a treatment with continuous infusion of unfractionated heparin was started immediately. However, no improvement was observed within seven days of treatment, even slight deterioration was observed with an increase dyspnea to NYHA III, persistent tachycardia (100-120 bpm) and drop in peripheral oxygen saturation was 92%. Based on entirely clinical image, a suspicion of non-thrombotic occlusion of pulmonary arteries was taken and the patient was referred to prompt pulmonary endarterectomy. Post-operative histological examination identified a rare tumor – pulmonary artery intimal sarcoma. Patients further hospitalization was uneventful. A follow-up positron emission tomography showed no suspicious metastasis foci. In 6-month follow-up patient is stable and further observed by multidisciplinary team including cardiologist, oncologist and pulmonologist.
Conclusions: To summarize, in a patient treated for pulmonary embolism resistant to anticoagulation there is a need for re-assessment for non-thrombotic causes of pulmonary embolism including rare malignant tumors, especially when fibrin degradation products are low.
Keywords: pulmonary embolism, angiosarcoma, angio-CT

Pelvic Congestion Syndrome (PCS) – still underdiagnosed cause of chronic pain in premenopausal women

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Introduction: The prevalence of chronic pelvic pain is approximately between 4% to 16% of women. It can be provoked by plentiful conditions, however in remarkable number of cases, chronic pain is the clinical manifestation of pelvic congestion syndrome (PCS).
Results: A 43-year old female presented with swelling and pain in the crotch. The patient reported everyday pain, more pronounced in evening hours, pain during intercourse or gynecological examination. After a few years of symptoms, pelvic congestion syndrome (PCS) was diagnosed with MRI and confirmed in TVUS. She was directed to an endovascular treatment. The patient went through 3 stages of embolization. Pain has decreased from 10 to 4 (VAS scale). Embolizations were performed with Seldinger technique through femoral vein access. Three-stage treatment comprised: insufficient left gonadal vein with reflux to uterine enlarged plexus. Left internal iliac vein venography revealed the reflux to uterine and vaginal plexuses with stasis of the contrast agent. Venography of the right internal iliac vein revealed widened venous parametrium plexuses and stasis of the contrast agent. The pathological vascular bed was embolized with coils and Aethoxysklerol (3%) foam.
Conclusions: Embolization is the best option for patients with pelvic congestion syndrome. It increases their quality of life and helps in better functioning. However, the aim is to appease the pain, and in many cases it has to be repeated, as the complaints are coming back.
Keywords: embolization, pelvic congestion syndrome, magnetic resonance

A case of inoperable giant coronary artery aneurysm with a significant progression over time

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Introduction: Giant coronary artery aneurysm is a rare phenomenon defined as a dilation of a coronary artery exceeding 4 centimetres and observed in 0,02% of patients undergoing coronary angiography.
Results: A 70-year-old male with a history of common iliac artery aneurysm, abdominal artery aneurysm and right adrenalectomy presented to a clinic for a cardiovascular assessment before thoracic surgery. Seven years earlier, a mixed-echogenicity mass measuring 12x15 mm was found on transthoracic echocardiography. At that time, the patient complained of nonspecific chest pain. After following cardiac magnetic resonance imaging (CMR) and coronary angiography, the patient was diagnosed with a right coronary artery aneurysm and coronary ectasia. Due to an inoperable character of lesions, the patient was qualified for conservative management by the Heart Team. In the following years, the aneurysmal lesions were traced through coronary computed tomography angiography (CCTA). Follow-up assessments presented a continuing progression in the size of two partially thrombosed aneurysms. The compression of the right heart by the greater aneurysm was depicted. A thorax computed tomography was performed recently due to a presence of a mass in the right lung which revealed a further expansion of the greatest aneurysm. On current admission, the patient reported physical activity limitation with exertional fatigue and paroxysmal palpitations. Echocardiography revealed severe right atrium deformation with undisturbed flow through the tricuspid valve. CCTA confirmed another expansion of the largest aneurysm (maximum transverse diameter of 86x60 mm) and prompt progression of thrombus recanalization inside the aneurysm. The patient was eventually allowed for thoracic surgery due to life-saving indications.
Conclusions: Giant coronary artery aneurysms pose a challenge for clinicians considering diagnostics and management. Comprehensive evaluation using diagnostic imaging modalities such as CCTA and CMR can be useful for determining optimal treatment and in further follow-up.
Keywords: giant coronary aneurysm, cardiac imaging

Pheochromocytoma in pregnancy associated with neurofibromatosis type 1

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Introduction: Neurofibromatosis type 1 is a genetic disorder that might affect multiple organ systems and increase the risk of causing a rare neuroendocrine tumor – pheochromocytoma. Our study aims to demonstrate the importance of recognising this condition and to emphazise its complex management during pregnancy, as in undiagnosed condition maternal and fetal mortality rate is around 50%.
Results: We present a case report of a 30-year-old primigravida with a rare presentation of pheochromocytoma associated with neurofibromatosis type 1, diagnosed before pregnancy, who was admitted to the outpatient clinic at Szpital Kliniczny Karowa in Warsaw in the first trimester of her first pregnancy. CT performed a year before revealed 36x25mm size mass, 50jH, in the right adrenal gland. MRI showed no signal dropout. 24h urine collection revealed high metoxycatecholamine concentration. Doxazosin and metoprolol were administered. Elective adrenalectomy was planned before the pregnancy. However, due to the onset of the COVID-19 pandemic, it was canceled. Pharmacological treatment was continued during pregnancy as a pretreatment before the removal of the adrenal gland. No peaks of blood pressure

were observed. In the 27th week of gestational age, the patient underwent adrenalectomy. Her blood pressure was 110/70, without orthostatic hypotension and heart rate was 92/min. The surgery was uneventful, cardiotocography was normal and an ultrasound scan showed an eutrophic fetus. At 39 weeks of gestational age, she gave birth by an elective cesarean section, wih spinal anesthesia. A 3170g healthy girl was born, Apgar's score was 10. Perioperative and early postnatal period was uneventful. The patient was discharged with a newborn.

Conclusions: Our study clearly shows that the course of pregnancy can be uneventful despite having pheochromocytoma. Although the rare cause of hypertension in pregnancy, physicians should bear it in mind as a potential cause. Early diagnosis, and proper management results in good maternal and neonatal outcomes.

Keywords: case report, pheochromocytoma, neurofibromatosis, pregnancy

Heart failure and toxic hepatitis in a young bodybuilder – catastrophic effects of anabolic steroids abuse

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Introduction: The use of anabolic-androgenic steroids (AAS) by athletes is a recurring problem in the media. We present a rare case of 32-year-old bodybuilder with AAS-induced heart failure (HF) and toxic hepatitis.

Results: A previously healthy 32-year-old bodybuilder referred to cardiology clinic with symptoms of acute HF. The patient has been intensively training weightlifting 4-5 times a week for over five years. He had a history of AAS abuse over the last 4 years. The first symptoms appeared a year earlier, ambulatory echocardiography(ECHO) showed left ventricle end diastolic diameter(LVEDD) of 63mm and ejection fraction(EF) of 49%. Despite the consultation, the patient did not stop intensive weightlifting and taking AAS. At admission ECHO showed EF of 25% and LVEDD of 78mm. Laboratory tests revealed significantly elevated troponin levels(42,2pg/ml), NT-proBNP(2288pg/ml) creatine kinase(583,8U/l) and serum transaminases Aspat(45,80U/l), Alat(106,90U/l). Sex hormones analysis showed elevated levels of testosterone(>15ng/ml), prolactin(29,73ng/ml) and estradiol(522pg/ml). After pharmacological therapy, clinical improvement was achieved and he was discharged home. Six months later, the patient was admitted to the hospital with jaundice, liver enlargement and heart failure deterioration. Laboratory tests revealed significantly elevated Alat 211U/l, Aspat 77U/l and bilirubin 12,36umol/l. AAS-induced toxic hepatitis was diagnosed. ECHO showed LVEDD enlargement(83mm) and EF of 15% with global hypokinesis. Coronary angio-CT was normal. CMR confirmed diagnosis of dilated cardiomyopathy, presented LVEDD of 90mm, EF of 10% with signs of myocardial fibrosis. Successful ICD implantation was performed. The patient was discharged in stable clinical condition. At 3 months of follow-up ECHO showed LVEDD of 87mm and EF of 15%. The patient was qualified for the Poltransplant list. After 7 months, a reduction in HF symptoms, increase in the EF(30%) and a decrease in the LVEDD(63 mm), were observed.

Conclusions: This case is indicative of the potential catastrophic effects of AAS and reinforces the warning against use of these drugs.

Keywords: anabolic-androgenic steroids; heart failure; toxic hepatitis;

Atypical carcinoid tumor of the right lung secreting ACTH

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Introduction: Cushing's syndrome is a group of clinical symptoms resulting from an excess of glucocorticosteroids. ACTH-dependent Cushig's syndrome may appear as the syndrome of ectopic ACTH secretion from an extrapituitary tumor. I present a case of a patient with atypical carcinoid tumor of the right lung secreting ACTH.

Results: A 38-year-old male patient with arterial hypertension was admitted to the endocrinology department in 2016 for further diagnosis of hypercorticism. The patient reported the face rounding, with the reposition of fat tissue on the nape and cheeks, accompanied by reddening of the skin of the face and neck. The patient also reported episodes of excessive somnolence accompanied by polyuria. Based on the performed tests, the diagnosis of ACTH-dependent Cushing's syndrome and secondary gonadal and thyroid axis insufficiency was diagnosed. MRI of the pituitary gland was performed and no focal lesions in the anterior pituitary gland were found. PET / CT examination with Ga68-labeled somatostatin analogue showed a right lung nodule in segment 3, with a diameter of 13 mm, located peripherally. The tumor showed a mediocre expression of somatostatin receptors. A steroidogenesis inhibitor (Ketoconazole) and a long-acting somatostatin analogue were included in the treatment. In October 2016, the right lung tumor was removed. During the follow-up visit, the patient did not show clinical signs of endogenous hypercorticism. After the operation, generalized swelling, plethora, and weakness resolved. In home measurements, blood pressure was within the normal range without antihypertensive drugs.

Conclusions: The aim of this case report was to show that in the case of the syndrome of ectopic ACTH secretion by a tumor with an extra-pituitary localization, locating the lesion as soon as possible and the causal treatment enables the patient to get rid of the bothersome symptoms of hypercorticism.

Keywords: endocrine system, hypercorticism, ACTH related Cushing's syndrome, carcinoid tumor 295 words

Seropositive rheumatoid arthritis superimposed on ankylosing spondylitis

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Results: A 52-year-old patient with long-standing ankylosing spondylitis, after arthroplasty of both hip joints was admitted to the Rheumatology and Immunology Department in February 2020 due to exacerbation of joint symptoms, despite the treatment (etanercept; from January 2020 secukinumab). The patient reported spine pain and stiffness, inflammatory pain and swelling of the peripheral joints (shoulders, elbows, hands, feet and knees) and a significant deterioration in mobility. In laboratory tests, inflammatory indicators were increased (CRP 35mg/l, ESR 73 mm/h). X-rays of hands and feet were normal. Ultrasound of the joints of the hands showed slight exudation with synovial hyperemia in both wrist joints, effusion in the proximal interphalangeal joint III of the left hand and in the fourth extensor compartment of the right hand. Systemic steroid therapy was used in the treatment, the non-steroidal anti-inflammatory drug was maintained, resulting in a transient clinical improvement. During the control at the rheumatology clinic, polyarthritis with symmetrical involvement of the wrists was still present. Autoantibodies were assessed: ACCP: 500 IU/ml; RF: 379 IU/ml – both at high titers. Based on this, RA was diagnosed. Treatment with tofacitinib was initiated in July 2021. Despite the treatment, his symptoms worsened, symmetric arthritis affecting hands persisted. JAK inhibitor was switched to tociziliumab which finally brought improvement.
Conclusions: It is important not to rule out the coexistence of rheumatoid arthritis and ankylosing spondylitis in one patient. Symptoms suggesting overlapping of these two disease entities should prompt for diagnosis and possible modification of treatment.
Keywords: ankylosing spondylitis, rheumatoid arthritis, secukinumab, tocilizumab. 293 words

Sudden cardiac death risk stratification in a patient with early repolarization pattern and family history of Brugada syndrome: a case report

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Introduction: Early repolarization pattern (ERP) consists of characteristic features regarding QRS complex and J-point. It can be diagnosed adventitiously in a 12-lead electrocardiogram (ECG) or Holter ECG monitoring, especially when pronounced ERP changes appear at night. ERP is considered a risk factor for major arrhythmic events in certain individuals, including patients with Brugada syndrome (BrS). The key point when dealing with patients with ERP is to stratify the risk of sudden cardiac death, including ERP features, and thereby to assess the requirement of implantable cardioverter-defibrillator (ICD) placement.
Results: A 24-year-old male was admitted to the hospital with the suspicion of BrS. Patient reported a single episode of presyncope which occurred during bathing in a warm water. He denied any syncopal episodes and did not experience a sudden cardiac arrest. His family history indicated two sudden cardiac deaths: in patient's father, who was diagnosed with BrS, and in patient's grandmother. There were no structural abnormalities in the echocardiography study and performed ajmaline challenge did not reveal typical for BrS ECG changes. Both, exercise test and repeated Holter ECG monitorings did not reveal any sustained ventricular arrhythmia. However, in 12-lead Holter ECG monitoring ERP in inferior and lateral leads was observed. Genetic study of sodium voltage-gated channel alpha subunit 5 gene (SCN5A) did not reveal abnormalities associated with BrS.
Conclusions: The patient remains under further diagnostics and close follow-up in the ambulatory clinic. ERP has a wide range of ECG features, which may determine potential malignancy. It is crucial to properly stratify the risk of major arrhythmic events both in symptomatic and asymptomatic patients with ERP to provide optimal clinical care.
Keywords: early repolarization pattern, J-point elevation, risk stratification, sudden cardiac death

Massive clots with a slight increase in D-dimer levels in young patient without thrombophilia

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Introduction: Thrombosis is a common, potentially life-threatening disease. The negative result of the D-dimer level in patients without risk factors in most cases excludes thrombosis or pulmonary embolism.
Results: A 45-year-old man admitted with a 1-month history of suffocation at rest. His medical history included acute biventricular cardiac insufficiency one month before admission, clots in cardiac chambers, thrombosis of the right axillary, subclavian and internal jugular vein, 'old' deep vein thrombosis in the right leg, obesity and liver damage. Pulmonary embolism was excluded in angio-CT. Echocardiography revealed a large mobile thrombus in the right ventricle 21x8 mm and a smaller one in the left ventricle 11x5 mm, enlargement of both atria, and the left ventricular ejection fraction was decreased to 35-40%. On Doppler ultrasound, the patient had an isoechoic mass, most likely a thrombus, in the left internal carotid artery (LICA) with critical stenosis. The clot reduced blood flow by 90% with a flow velocity of 2,0/0,85 m/s. The level of D-dimer was slightly higher than the normal range (0,71 mg/l). The patient was qualified for conservative

treatment and treated with low molecular weight heparin and oral anti-Xa inhibitor. The diagnostic process excluded hypercoagulability syndromes except for a high level of factor VIII. No cancer was identified. A successful angioplasty with stent implantation in LICA was performed. Antiplatelet therapy and prolonged anticoagulation therapy were applied. Control echocardiography after 3 months showed no thrombus in the heart ventricles.
Conclusions: We presented the clinical case in which, despite disseminating arteriovenous thrombosis, the D-dimer level was only slightly increased – even in the range that might allow to exclude thromboembolism. We also would like to stress the fact that, despite such advanced thrombosis, we did not find a thrombus in the pulmonary arteries or any plausible cause of the patient's condition.
Keywords: arteriovenous thrombosis, D-dimer level

A rare case of arterial thrombosis in a young woman with a ten-year follow-up

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Introduction: Arterial thrombosis is a severe vascular complication and a common cause of acute ischemia. It rarely occurs in healthy young people and usually is associated with hypercoagulability. We present a rare case of arterial thrombosis in two locations in a young woman without hypercoagulation with a ten-year follow-up.
Results: A 21-year-old previously healthy woman was admitted with a sudden, acute pain and movement impairment in the right leg. She had been taking synthetic estrogen preparation for a year. An ultrasound revealed thrombosis of the right common iliac artery. She was diagnosed with an acute leg ischemia, and targeted thrombolysis with unfractionated heparin was effectively applied. After this procedure, the thrombosis recurred; therefore, surgical embolectomy was performed. The signs of the ischemia resolved. The administration of low molecular weight heparin and acetylsalicylic acid was continued. A venous ultrasound revealed no abnormalities. One month later, the patient presented with visual disturbance and a persistent headache. Diagnostic imaging showed an ischemic area in the right hemisphere, no blood flow on the C4 intracranial level of the internal jugular artery, and impaired blood flow in the middle cerebral artery. After the anticoagulation and antiplatelet therapy, the symptoms subsided without any neurological impairment. The genetic and immunological tests revealed no hypercoagulability. The test of fibrin properties showed that its structure and function were compromised. It increased the risk of rapidly-forming compact and lysis-resistant clots. Chronic anticoagulant and antiplatelet therapy was instituted and retained for a decade, preventing thromboembolic events (in the meantime she gave birth to a healthy child). The test was repeated after the decade, demonstrating improvement: fibrin's permeability had increased and the clot lysis time shortened.
Conclusions: Transient, unfavorable features of fibrin's structure may increase the risk of various thrombotic complications in arterial vessels, possibly necessitating chronic anticoagulant therapy.
Keywords: arterial thrombosis, fibrin properties, anticoagulant therapy

Eltrombopag and telemedicine as effective treatments of MDS

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Introduction: Eltrombopag is a thrombopoietin receptor agonist which is registered for use in the treatment of immune thrombocytopenia and severe aplastic anemia. However, there are also other situations where severe thrombocytopenia is life-threatening for example in some myelodysplastic syndromes (MDS). MDS are clonal myeloid disorders characterized by ineffective bone marrow hematopoiesis and peripheral blood cytopenias.
Results: A 72 female patient was initially diagnosed at the Department of Hematology, Transplantology, and Internal Medicine, Medical University of Warsaw with refractory cytopenia with multilineage dysplasia (RCMD) variant of MDS. Her only symptom was hematuria. The platelet (PLT) number varied around 35 G/l. The patient remained under observation without treatment over the next 5 years. The patient indicated problems such as hematuria, pyuria and proteinuria. In March 2021 PLT decreased under 6 G/l with hematuria which is a life-threatening situation. After telephone consultation, she received a prescription of eltrombopag which is available in open pharmacy but not reimbursed for this indication. She started to take it orally at the smallest available dose of 25 mg once daily. Her PLT number started to gradually increase and at one month reached 100 G/l. Simultaneously treating physician has applied for permission for such treatment as a therapeutic experiment which was granted. However, the financial burden to the patient for this therapy was high and an attempt was made to lower the dose to take the drug every other day. This has allowed maintaining the PLT level around 45G/l. The patient has no bleeding complications and suffers from only minor ailments, which were treated with antibiotics and herbal extracts.
Conclusions: This case documents that MDS with life-threatening thrombocytopenia can be effectively managed using eltrombopag within the procedure of the therapeutic experiment and that such treatment can be successfully performed by phone providing the cooperation of a local family physician.
Keywords: Eltrombopag, telemedicine, myelodysplastic syndromes, thrombocytopenia

Case report: deep neuropathic-ischemic diabetic foot ulcer at high risk of major lower limb amputation

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Introduction: Diabetic foot syndrome (DFS) followed by diabetic foot ulcers (DFUs) can lead to amputation, disability, and premature death. DFS requires a multidisciplinary approach and constitutes a challenge for national health care systems.
Results: A 67-years-old obese woman with type 2 diabetes (T2DM) and its chronic complications as well as numerous comorbidities was admitted to the Department of Metabolic Diseases and Diabetology at the University Hospital in Krakow after minor foot amputation with a deep, infected DFU of the left foot at a high risk of major lower limb amputation. At first, intravascular revascularization of left lower limb was successfully performed. The foot exam revealed a painless, deep, infected DFU with exposed bones in the wound bed and necrosis at the ulceration edges. The patient was diagnosed with mixed (neuropathic-ischemic) DFU and osteomyelitis. Most of the necrotic tissue was removed by surgical debridement and the cleaning process was subsequently continued. Deep swab was collected for testing while empirical wide-spectrum antibiotics were implemented. As a metabolic control a multiple daily insulin injection therapy (MDI) was continued. To facilitate the wound closure negative pressure wound therapy (NPWT) was used. Both, the advanced moist therapy (AMT) and the use of special dressings were applied. After 3 weeks of hospitalization the woman was discharged, and treatment was continued in Department's outpatient clinic till the complete wound closure. General rehabilitation without foot bearing was simultaneously performed.
Conclusions: This case is an excellent example of multidisciplinary approach in the DFS treatment. Offloading, revascularization, debridement, antibiotics administration, metabolic control, and an appropriate choice of additional DFU topical therapy enabled both prevention from the major limb amputation and the maintenance of the affected foot function. Nevertheless, a special boot is needed, and risk of DFU recurrence persists high.
Keywords: T2DM, DFS, DFU, revascularization, NPWT.

Hypothyroidism and cardiac hypokinesis – consequence or coexistence?

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Introduction: Most patients with Dilated Cardiomyopathy (DCM) require complex diagnostic process, rarely specific treatment can be introduced, therefore the prognosis is usually poor. However, several forms of "reversible DCM" despite similar challenges in diagnosis and treatment, are characterized by the ability to fully recover from left ventricular dysfunction. One of them can be hypothyroidism.
Results: A 30-year old woman was admitted in January to the hospital with uncontrolled Hashimoto disease and to exclude secondary hypertension. Before admission, she had stopped taking levothyroxine for 6 months, reaching TSH 442 uIU/ml in September. Treatment with levothyroxine 250 ug was introduced again in October, and from that time her symptoms- weight gain, fatigue, dry skin, generalized edema, shortness of breath (NYHA III) had increased. She also presented a high blood pressure of 170/132 mmHg with NT- pro BNP 2134 pg/m; D-dimers 4,62 mg/l. The echocardiogram showed an enlarged left ventricle, enlargement of both atria, wall thickening, decreased contractility with EF 26% and GLS – 8.1%, diastolic dysfunction, dilated ascending aorta, tricuspid regurgitation and a high risk of pulmonary hypertension. Secondary hypertension was ruled out. After a further 3 months of high blood pressure and levothyroxine treatment the patient reported with a better-well-being and a higher tolerance of exercise; a second echocardiogram was performed, the results are as following: EF 55%, GLS av: -19% with preserved contractility.
Conclusions: Hypothyroidism can cause transient cardiomyopathy, and a replacement treatment with levothyroxine can significantly improve myocardial function, however the myocardium can be stunned at the beginning of the treatment. Consequently, thyroid function tests should be performed in patients with cardiomyopathy of an unknown origin to rule out hypothyroidism.
Keywords: Hashimoto disease, transient cardiomyopathy

Coexisting CLL and MGUS: a case report

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Introduction: Chronic lymphocytic leukemia (CLL) is the most common leukemia in adults. Monoclonal gammopathy of unknown significance (MGUS) is an unsymptomatic condi-

tion characterized by presence of an abnormal monoclonal protein in the blood. It can transform into multiple myeloma (MM). The current treatment approach to MGUS is observation. CLL very rarely coexists with plasmocytic dyscrasias, and few reports on such cases exist.
Results: A 58 year old male presented with leukocytosis (20,9 G/L) and lymphadenopathy. He was in good general health (ECOG: 1) and any comorbidities, but reported an allergy to trimetroprim+sulfametoksazole. A lymph node biopsy was taken at presentation and revealed a diagnosis of CLL of Rai I and Binet B stage. A month later, routine tests showed coexisting monoclonal IgA and IgM proteins and kappa light chains, serving as a basis for a diagnosis of a concurrent MGUS. 8 months after diagnosis of CLL, the patients' WBC count began to rise and reached 200 G/L with lymphocytes 180 G/L. CT scans revealed enlarged lymph nodes in the mediastinum, axillary fossa, paraaortal region, near the visceral trunk and surrounding the iliac vessels and splenomegaly. Because of the advancement of CLL, the patient began R-FC chemotherapy (rituximab+fludarabine+cyclophosphamide). After four cycles of chemotherapy, CT scans showed a decrease of nodal masses and spleen of around 40%. The patient received two more cycles of R-FC and achieved partial remission (PR) of CLL. Currently, 44 months after diagnosis of CLL, after 6 cycles of R-FC, the patient is still in partial remission of CLL and has correct blood counts.
Conclusions: Because MGUS is a benign hematologic disorder, our patient was only treated for CLL and successfully achieved PR. This case serves shows that although uncommon, CLL can coexist with plasmacytic disorders. In such situations, the choice of treatment depends on the type of coexisting plasmacytic dyscrasia.
Keywords: Hematology, Chronic lymphocytic leukemia, chemotherapy, MGUS, Plasma cell dyscrasias

Acute liver failure in the course of Wilson's disease

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Trustee: Michał Borys MD, PhD

Introduction: Wilson's disease is an inherited disease caused by the mutation of ATP7B gene, which codes transmembrane ATP-ase transporting copper. The mutation leads to the accumulation of copper in the soft tissues. Most often it is stored in the liver and brain. The clinical course may differ among patients, however, progressive liver disease is one of the most common manifestations. Fast diagnosis and proper treatment may increase the patient's survival rate.
Results: A 21-year-old woman without any previous medical history was admitted to the Intensive Care Unit (ICU) of the University Hospital. The reason for the admission was acute liver failure. At the admission the patient was conscious, GCS 15, she needed supplemental oxygen therapy. Laboratory tests showed increased bilirubin level 46mg% and high INR. On the first day, renal replacement therapy and plasmapheresis were started and continued till the discharge of the patient. Within the first days, the bilirubin level was decreased by half. The patient presented ascites, which needed peritoneal drainage. The patient had disturbed consciousness and digestive tract disorders that disappeared during hospitalization. The circulatory system was supported with catecholamines. The patient was put on the waiting list for a liver transplant. Until transplantation patient had aggregately 25 plasmapheresis cycles and a single SPAD treatment, which led to reduction of bilirubin level from 40 mg/dl to 10 mg/dl. After 36 days in the ICU, the patient was transferred to another hospital, where she awaited the transplant.
Conclusions: This case suggests that undiagnosed and untreated Wilson's disease can be fatal to the patient. However, certain patients will require a liver transplant despite the treatment.
Keywords: Wilson's disease acute liver failure

SARS – COV 2 infection in hematological malignancies

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Trustee: Ioana Onofrei, Associate Professor, MD, PhD

Introduction: The new coronavirus pandemic has caused significant morbidity and mortality worldwide. Elderly patients, immunocompromised patients and patients with comorbidities belong to risk groups for an unfavorable prognosis of the disease. A concern exists regarding the vulnerability of patients who have been treated with immunosuppressive drugs prior or during this pandemic since they may also have decreased detrimental inflammatory responses. Patients with haematological malignancies have worse outcomes than the general population as their clinical course can be altered by their immunosuppressed state.
Results: A 81 – years old, male patient was hospitalized in Clinic of Infectious Disease "Sf Parascheva" Iasi with confirmed SARS – COV 2 infection. Physical examination revealed a "silent" hypoxia, without significant respiratory distress, but low oxygen saturation (80% on room air). The patient had a significant medical history with tuberculosis (possible without antituberculous treatment) and Waldenström macroglobulinemia with secondary dysimmune syndrome treated 6 years ago with immunosupressants and biological therapy. Treatment with antivirals (lopinavir/ritonavir), corticosteroids, anticoagulants and antibiotherapy was initiated. Severity of COVID pneumonia was confirmed by X – ray. Patient also presented an acute diarrheal syndrome possible related to antivirals since toxins for Clostridium difficile test was negative. Because of negative prognosis factors, treatment was shifted to Tocilizumab, 5 day administration of Remdesivir and broad – spectrum antibiotics. Evolution was slowly favorable and the patient was discharged with recovery of the respiratory function after 18 days of hospitalization.
Conclusions: Our findings suggest that even in cases of an immunosuppressed patient with hematological malignancy and SARS – COV 2 infection, the appropriate clinical

management together with respiratory therapy contributes to patient's survival.The increase of IL-6 within the "cytokine storm" within COVID-19 infection may be a risk factor for Waldenström disease, but the dministration of Tocilizumab (IL-6 receptor antagonist) exerted beneficial effects.
Keywords: immunology, inflamation, COVID-19, Waldenström's macroglobulinemia

Unusual presentation of lung cancer in a 67-year-old female

Kacper Dykas, Magdalena Król
Department of Endocrinology of Jagiellonian University Medical College

Trustee: Małgorzata Trofimiuk-Müldner, MD, PhD

Introduction: Paraneoplastic syndromes (PNS) are present in about 8% of patients with neoplasms. Their signs and symptoms may precede the classical manifestation of tumours and this fact allows early diagnosis vital for the introduction of treatment. Small cell lung cancer (SCLC) comprises about 15% of all cases of lung cancer and can manifest with three of PNS: syndrome of inappropriate antidiuretic hormone hypersecretion (SIADH), ectopic ACTH syndrome (EAS), and Lambert-Eaton myasthenic syndrome (LEMS).
Case Report: A 67-year-old woman was admitted to the emergency department due to a pre-syncope symptoms. Physical examination revealed striae on the abdominal wall and diminished breathing sounds parabasal on the left side. One year earlier, a round lesion on the chest radiograph was found, the patient started to have recurrent bronchitis and episodes of hyponatraemia and hypokalaemia. After admission to the hospital, on radiological imaging, the disseminated lung neoplasm was found and the biopsy confirmed diagnosis of SCLC. Laboratory examinations revealed progressive hyponatraemia and hypokalaemia. Plasma osmolality was reduced which allowed diagnosis of SIADH. The further evaluation also showed an increase in ACTH and cortisol concentrations, with no response in the 2 mg dexamethasone suppression test, which was the basis of the diagnosis of EAS. The patient was treated with restriction of fluid intake, sodium and potassium supplementation and fludrocortisone. Systemic chemotherapy has also been started.
Conclusion: SIADH is found in about 10% of SCLC cases, while EAS is only found in about 2%. The co-occurrence of both paraneoplastic syndromes is extremely rare- previously only 8 similar cases were reported in the literature. Due to their pathogenesis, the symptoms of SIADH and EAS can counter each other, which makes them difficult to diagnose. In the differential diagnosis of unusual signs and symptoms, neoplasms should always be included.
Keywords: lung cancer, paraneoplastic syndromes, SIADH, EAS

Psychiatry, Neurology & Neurosurgery

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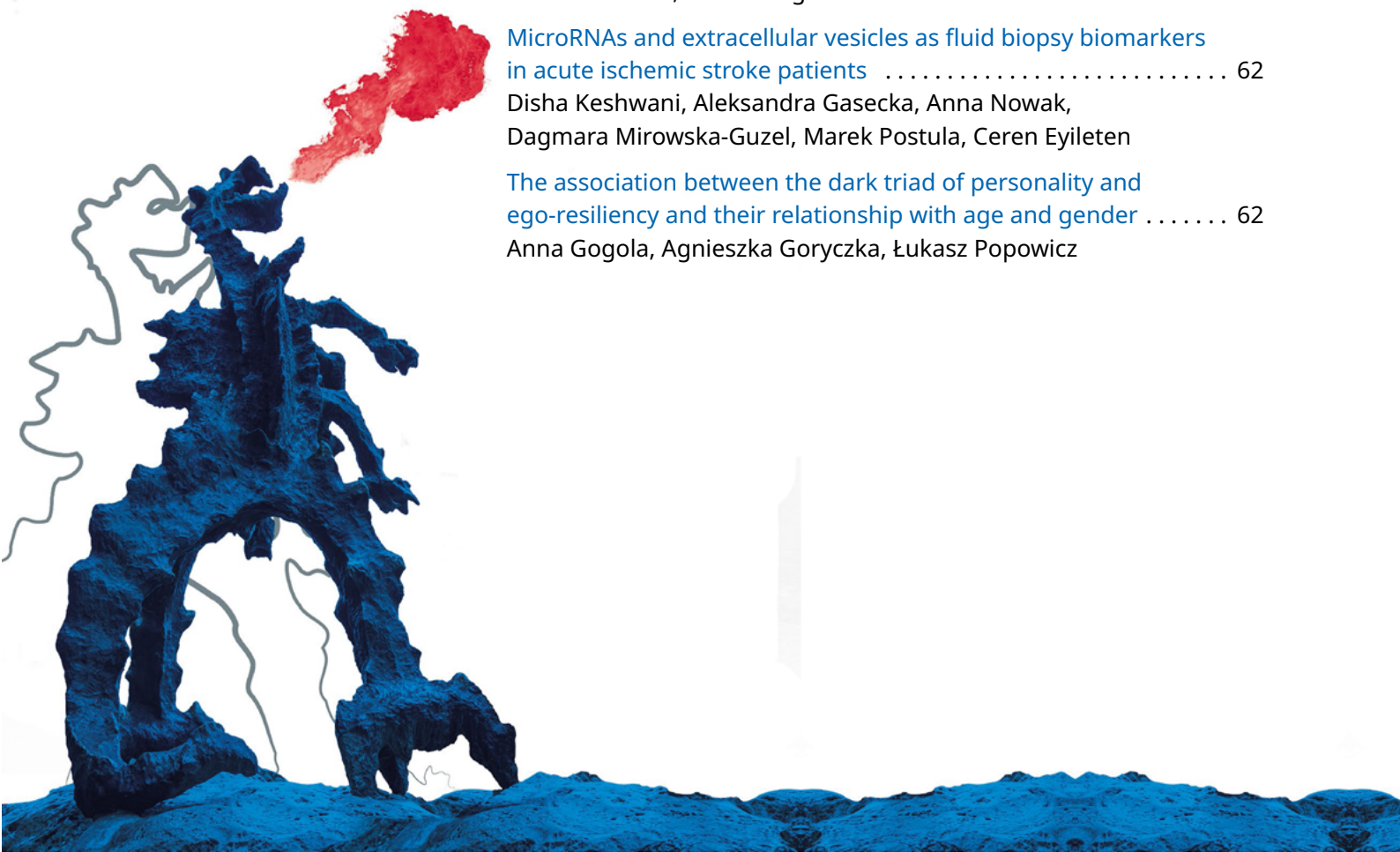

Does gamma radiation affect behavior and mood?

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Trustee: Monika Figura, MD, PhD

Introduction: Tremor is one of the most common symptoms of Parkinson's Disease (PD) and essential tremor (ET). The first line of treatment is pharmacotherapy. It can sometimes be ineffective or contraindicated. In such cases, surgical treatment is an option. Deep Brain stimulation (DBS) or thalamotomy are among the commonly used methods.
Aim of the study: The purpose of our observational study was to assess the impact of unilateral Gamma Knife thalamotomy on psychological functions in ET and PD patients.
Material and methods: We included 20 patients with PD (n=10) or ET (n=10) with pharmacoresistant tremor. The mean age was 63.5 (+/-9.5), 16 male and 4 female. They underwent psychological assessments before (n=20); 12 months (n=20), and 24 months (n=11) after the procedure. Mini-Mental State Examination, CLOX, Tower of London, Benton Judgment of Line Orientation test, Adverse Childhood Experience, The Wechsler Adult Intelligence Scale, Rey Auditory Verbal Learning Test, Boston Naming Test, and Beck's Depression Inventory tests were performed. Friedman's ANOVA and Wilcoxon's signed-rank test were used to compare the outcomes.
Results: There were no serious adverse events related to the procedure reported in our study. Statistical analysis revealed no significant change (p>0,05) in performed psychological tests in 2-year follow-up.
Conclusions: We conclude that Gamma Knife thalamotomy does not deteriorate the mood or cognitive functions of the patients treated due to tremor associated with PD or ET in a 2-year follow-up. It may be a safe and efficient way of treating pharmacoresistant tremors for patients who are not qualified for DBS procedure.
Keywords: thalamotomy, GammaKnife, Parkinson's disease, tremor

MicroRNAs and extracellular vesicles as fluid biopsy biomarkers in acute ischemic stroke patients

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Trustee: Ceren Eyileten, Assistant Professor, MD, PhD

Introduction: Ischemic stroke (IS) is one of the most frequent causes of death.
Aim of the study: We aimed to analyze the circulating platelet-derived miR-19a-3p, miR-186-5p, Let-7f, platelet-extracellular vesicles (EVs), leukocyte-EVs, and endothelial-EVs levels 24-h and 7-days after IS as novel diagnostic and prognostic/predictive biomarkers.
Material and methods: Blood samples of 28 patients with acute IS were collected 24-h and 7-days after stroke and 35 age- and gender-matched individuals free of stroke. Platelet reactivity by AA-TRAP-ADP-induced platelet aggregometry. PlasmaRNA was extracted; quality RNA was assessed: fluorometric assay; RT-PCR formiRNAs expression and flow-cytometry for EVs determination.
Results: Patients with IS on day-1 had significantly higher platelet reactivity assessed by AA-induced platelet aggregometry compared to controls (p=0.001). Patients with normal platelet activation had significantly higher miR-186-5p levels compared to patients with HPR at day-1 acute-stroke (p=0.034). 7-days after stroke, levels of miR-186-5p decreased in the same patients with normal platelet reactivity (p=0.036). Patients with HPR had increased platelet-EVs (CD62) compared to patients with normal platelet reactivity at the day of 1 acute-stroke (p=0.012). Patients with HPR had significantly higher leukocyte-EVs (CD45) compared to patients with normal platelet function at day-1 stroke (p=0.002). Diagnostic values of miRNAs and EVs evaluated with receiver operating characteristic (ROC) curve analysis, showed pooling the miR-19a-3p, platelet-EVs, and leukocyte-EVs yielded a higher AUC than the value of each individual biomarker as AUC was 0.893 (95% CI, 0.79-0.99). Moderate stroke patients had significantly elevated miR-19a-3p compared to minor stroke patients at the day of acute IS. ROC curve was 0.867, (95% CI, 0.74-0.10) p=0.001.
Conclusions: Our analysis showed alteration of miRNAs and EVs after IS. Combination of miR-19a-3p, Let-7f, platelet-EVs and leukocyte-EVs have potential diagnostic values for acute stroke and miR-19a-3p can predict the severity of stroke in IS patients.
Keywords: miRNAs, platelet-extracellular vesicles (EVs), Ischemic Stroke

The association between the dark triad of personality and ego-resiliency and their relationship with age and gender

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Trustee: dr n. med. Paweł Dębski, dr n. med. Magdalena Piegza

Background: The dark triad of personality (DT) consists of subclinical psychopathy, narcissism, and Machiavellianism. Individuals with elevated DT traits are characterized by egoism, egocentrism, limited empathy, and difficulties in expressing or understanding emotions.
Ego-resiliency is a set of traits that promote emotional stability and healthy adaptation to life's vicissitudes. This construct allows adapting to changing conditions during crises and traumatic or stressful situations. Due to a lack of scientific

research, the relationship between DT and ego-resiliency is still unclear.

The aim of the study was to assess the relationship between DT and ego-resiliency. Additionally, we examined the relationship of these variables with age and gender.

Materials and methods: A total of 604 Polish citizens completed an anonymous online questionnaire. The study included 468 women (77.5%) and 136 men (22.5%); aged between 16 and 69 years (28.85±11.28). DT was measured using the Polish version of the Dirty Dozen scale, while ego-resiliency was assessed using the Ego-resiliency scale. The data were analyzed using Excel 2016 and Statistica 13.3.

Results: Data analysis showed no statistically significant relationships between DT traits and ego-resiliency. Significant negative correlations were observed between the severity of DT (and its components: Machiavellianism and narcissism) and age of the study group ($r=-0.251$; $p<0.05$). Men presented a significantly higher intensity of the overall DT score, as well as its components – psychopathy and Machiavellianism. Significant positive correlations were observed between the level of ego-resiliency and age ($r=0.157$; $p<0.05$). Men presented higher intensity of ego-resiliency.

Conclusion: The study showed no relationship between DT and ego-resiliency. Both DT traits and ego-resiliency are more prevalent among men. The severity of DT traits and ego-resiliency may change with age. Older people present a higher level of ego-resiliency and a lower level of DT traits.

Keywords: Dark triad of personality; ego-resiliency; narcissism, psychopathy, Machiavellianism

Orthopaedics, Sports Medicine

Jury:

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Barbara Jasiewicz, MD, PhD
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Coordinators:

Maria Rozpłoch, Marianna Zygmunt

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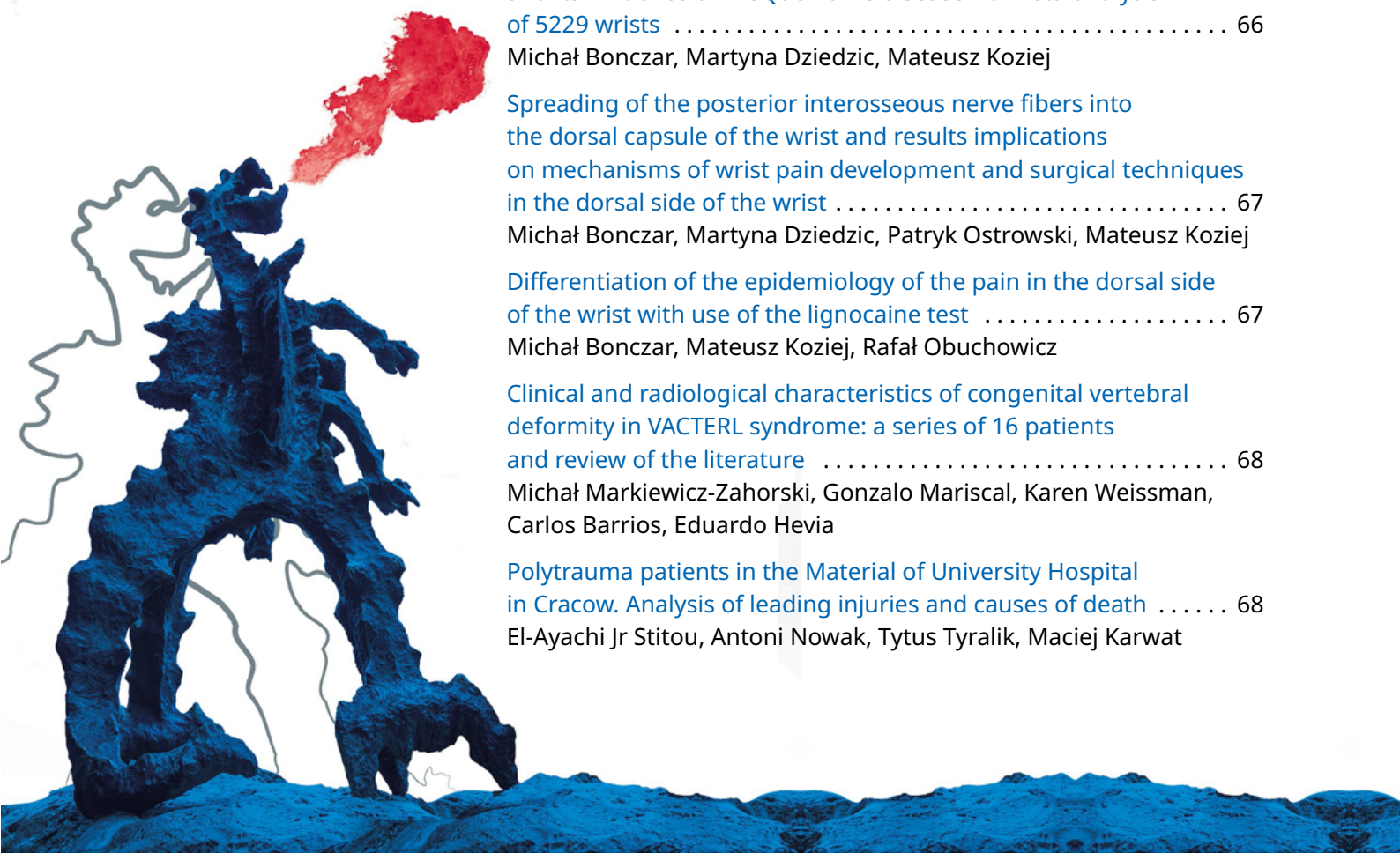

The role of external fixator in unstable pelvic ring injuries – an update

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Trustee: Jarosław Brudnicki, MD, PhD

Introduction: Pelvic ring fractures account for 3-6% of all skeletal fractures and they are connected with high mortality and morbidity rates. This is due to substantial haemorrhage in the first 24 hours after trauma and with multiorgan failure as it's consequence. In unstable pelvic ring fracture, the external fixator device is the gold standard used for quick stabilization of the pelvic ring, bleeding control and reduction of the pelvic volume.
Aim of the study: The aim of the study was to summarize and collect guidelines and information from the last 20 years about the use of external fixator devices in unstable pelvic ring fractures.
Material and methods: Analysis of articles found by PubMed database and summary of information on the use of external fixator in pelvic ring fractures. 118 articles were found after entering the key words: pelvic fracture, pelvic stabilization, external fixator, unstable pelvic ring injuries in the database. Articles that did not meet the criteria of the subject of the study were rejected and 16 articles, that dealt with the use of an external fixator, were selected.
Results: Depending on the fracture type according to Young & Burgess and accepted by AO/OTA Tile's classification and the patient's general condition, the EF can be placed in two routes – on the supra acetabular area or on the iliac crest. The main advantages of using EF among patients are reduced mortality rate, shorter hospital length of stay and reduced need for blood transfusions. The main disadvantage is the slightly increased risk of infection and damage to the anatomical structures of the pelvis.
Conclusions: External fixator still appears to be a gold standard method for the treatment of Tile B and C unstable pelvic ring injuries. However, the possible risk for infection and anatomical structures damage should be enter into consideration during patient's treatment.
Keywords: external fixator, unstable pelvic ring fracture, pelvic stabilization

Evaluation of indications and qualification for surgery of patients with distal radius fractures

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Trustee: Jarosław Brudnicki, MD, PhD

Introduction: Distal radius fractures are one of the most common fractures among adults, especially the elderly ones. The most common mechanism of injury is fall with the support of the hands. Though huge advance in trauma and orthopaedics, distal radius fractures still remain an important clinical and social problem. There are many controversies concerning treatment and still ongoing discussions on qualification to the surgery and choice of method of surgical treatment.
Aim of the study: The aim of our study was to assess patient's features with the fracture of the distal segment of radius, on the base which they were classified to surgical treatment in University Hospital in Krakow.
Material and methods: All patients with distal segment fracture of radius admitted in the Emergency Room in the University Hospital of Krakow during a two-year period (2020- 2021) were enrolled in our cross-sectional study. To classify fractures, we used AO/OTA classification. Data were taken from the patients' documentation in the emergency department, outpatient department and trauma surgery department.
Results: The present study shows that 217 patients with fracture of the distal end of radius were admitted to the emergency room. 20 of them were treated with surgery in the University Hospital of Krakow. Patients with open fractures and fractures including articular surface were directly classified to the surgery. Patients with failure of conservative medication were classified to the elective surgery.
Conclusions: Our results show that only a small number of patients with distal radius fractures required surgery. For majority of patients conservative treatment was sufficient. Surgical treatment of distal radius fracture is a common way of management, but taking under consideration the amount of this fractures, availability of resources and general costs indications for surgical treatment should be carefully assessed.
Keywords: radius, distal-end, fracture, indication, qualification

Anatomical variations of the first dorsal compartment of the wrist and its influence on DeQuervain's disease – a meta-analysis of 5229 wrists

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Trustee: Mateusz Koziej, Associate Professor, MD, PhD

Introduction: The first dorsal compartment of the wrist includes tendons of abductor pollicis longus (APL) and extensor pollicis brevis (EPB). However, many studies have showed multiple anatomical variations including anomalies in the number of both APL and EPB tendons and presence of intercompartmental fibro-osseous septum. Unfortunately, studies describing those variations are not consistent.
Aim of the study: The aim of this study was to provide physicians, especially surgeons dealing the the DeQuervain's disease (DQD) in their daily practice with the most accurate and up-to-date data about these anatomical variations in the population, as it is believed that it may strongly benefit in diagnosing and precisely treating this ailment.
Material and methods: For this purpose, PubMed, Scopus, Web of Science, Embase and a number of minor online libraries were searched. Articles which included exact data about

the number of APL or EPB tendons or a presence of intercompartmental septum were qualified for a more precise evaluation. Therefore, out of 1629 studies initially evaluated, 68 were finally included in this meta-analysis. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Results: A total of 5229 studied wrists have been included in this study. Double APL and single EPB are the most common variations of tendons in the first dorsal compartment, both in cadavers and patients with the DQD, with no statistically significant differences between those two groups ($p > 0.05$). Presence of intercompartmental fibro-osseus septum is much more common in patients with the DQD than in cadavers or patients without the diagnosed DQD ($p < 0.05$).

Conclusions: Our results should improve the awareness of anatomical variations in the first dorsal compartment, which in turn should have impact on precise treatment of de Quervain's disease in clinical practice. Targeted therapy is strongly advised and methods of differentiation and treatment are discussed.

Keywords: DeQuervain's disease, abductor pollicis longus, extensor pollicis brevis, first dorsal compartment of the wrist.

Spreading of the posterior interosseous nerve fibers into the dorsal capsule of the wrist and results implications on mechanisms of wrist pain development and surgical techniques in the dorsal side of the wrist

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Trustee: Mateusz Koziej, Associate Professor, MD, PhD

Introduction: Several articles have been published related to carpal anatomy and its biomechanical function, which has provided a substantial amount of information about the innervation of the wrist joint. However further research is required on the structures of the carpal nerves. The literature is lacking in articles on the conductivity of proprioception and the neuroanatomical characteristics of the wrist.

Aim of the study: The aim of this study was to determine whether and how posterior interosseous nerve (PIN) fibers penetrate the dorsal capsule of the wrist, as they may implicate observations, among others, regarding the role of PIN in wrist pain and the role of the dorsal capsuloligamentous scapholunate septum (DCSS) in the conductivity of proprioception of the wrist.

Material and methods: Thirty dorsal capsules were collected from the wrists of 15 adult cadavers and prepared for histological analysis. To reveal the nerves that penetrate the dorsal capsule, each preparation was stained and divided into three histological patches – one from the palmar side of the dorsal capsule and two located above the first, more on the dorsal side of the dorsal capsule. Therefore, potential arrangements of the fibers were assessed.

Results: PIN fibers were established to penetrate the dorsal capsule of the wrist. The distribution of fibers in the dorsal capsule of the wrist was established. Subsequently, an anatomical map was created of the most common patterns of the fiber distribution.

Conclusions: Impact of PIN penetration into the dorsal capsule of the wrist was discussed considering the most common surgical approaches in this area. Both the PIN and DCSS roles in the conductivity of proprioception of the writ were analyzed.

Keywords: posterior interosseous nerve, dorsal capsuloligamentous scapholunate septum, wrist pain

Differentiation of the epidemiology of the pain in the dorsal side of the wrist with use of the lignocaine test

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Trustee: Rafał Obuchowicz, Associate Professor, MD, PhD

Introduction: Wrist pain is a frequent medical problem which exact cause can be difficult to diagnose solely on clinical basis.This may be due to rather complicated and complex anatomy composed of numerous small structures in the region of the wrist, which makes imaging problematic.

Aim of the study: Aim of this study was to describe our method of dorsal wrist pain differentiation before preforming a surgical procedure to provide surgeons, with an accurate diagnosis of the causes of the pain at dorsal wrist region.

Material and methods: Study was conducted on the group of 100 patients routinely diagnosed for the wrist pain. Four sites for lignocaine injection were proposed: posterior intercostal nerve (PIN), scapholunate ligament (SLL), radio carpal joint (RCJ) and distal radio ulnar joint (DRUJ).

Results: Pain was abolished after lignocaine injection of PIN – 82% of cases , SLL – 5%, RCJ 4% and 2 % -DRUJ. In 2% of patients result was ambiguous where pain relief was obtained after simultaneous injection at more than two proposed sites. In 2% of patients no results of lignocaine administration was noticed. No adverse effect of lignocaine administration in aforementioned group were observed. Markedly high correlation with surgical intraoperative findings was found. Error matrix created on the basis of statistical analysis presented high values of positive predictive value and negative predictive value of the proposed tests (98 and 96) respectively.

Conclusions: Lignocaine test, in combination with the detailed anatomical knowledge and correct execution of injection procedure is a very accurate method of differentiation the etiology of the pain in the dorsal side of the wrist. Usage of this method in the clinical practice allows surgeons to choose exact and targeted treatment which can minimize the chance of potential complications and maximize the chances of efficient and successful therapy.

Keywords: dorsal side of the wrist, wrist pain, lignocain test, ultrasound.

Clinical and radiological characteristics of congenital vertebral deformity in VACTERL syndrome: a series of 16 patients and review of the literature

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Trustee: Gonzalo Mariscal, MD

Introduction: VACTERL syndrome is a polymalformative disorder characterized by vertebrae, extremities, cardiac, airways and digestive tract defects. Due to small number of series addressing spinal deformities of patients with VACTERL syndrome, recommendations and guidelines of clinical management remain unclear.
Aim of the study: The objective of this study was to carry out a descriptive study of the clinical and radiological characteristics of congenital vertebral deformity in VACTERL syndrome as well as to compare conservative with surgical treatment. Additionally, a review of preexisting literature was performed.
Material and methods: A multicenter retrospective study of patients with congenital scoliosis associated with VACTERL syndrome was carried out. We collected: type of deformity (formation, segmentation and mixed defects), associated anomalies, initial cobb angle, location of scoliosis, cobb angle at final follow-up, treatment (surgery group vs conservative group) and complications.
Results: We included 16 patients with VACTERL syndrome and congenital scoliosis. 50.0% of patients were female. The most frequent deformity was mixed vertebral defects (10/16, 62.5%) followed by formation defects (5/16 31.3%). Most frequent localization of deformity was the thoracic location (7/16 43.8%). 9 patients received surgical treatment versus 7 patients who were treated conservatively with progressive corrective casts. There were no differences in follow-up between the two groups. There were significant differences regarding the initial cobb (49.8±25.9 surgery group vs 25.3±9.4 conservative group; p=0.03). Regarding the total correction achieved at the end of follow-up, there were significant differences (-25.2±13.3 surgery group vs 5.1±18.0 conservative group; p=0.002).
Conclusions: There are no large case series dealing with congenital spinal deformity in VACTERL syndrome. We present a descriptive study of the characteristics of this uncommon association. Conservative treatment does not achieve satisfactory curve corrections compared to surgical treatment, although it prevents the progression of the deformity.
Keywords: VACTERL syndrome, Congenital Scoliosis, Spine Deformities

Polytrauma patients in the Material of University Hospital in Cracow. Analysis of leading injuries and causes of death

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Trustee: Jarosław Brudnicki, MD, PhD

Introduction: Polytrauma or multiple injured patients is one of the most difficult problems in trauma surgery. Despite the rapid development of medicine in the last century, accidents still remain the 1st most common cause of death in the young population, and 3rd in the general population.
Aim of the study: The aim of the study was to analyze characteristics of the polytrauma patients admitted to the University Hospital of Cracow.
Material and methods: Data of patients admitted to the hospital between 01.01.2020-31.12.2021 were acquired from the hospital patient database. Data about patients who died after admission were gathered from the Department of Forensic Medicine.
Results: 74 cases of polytrauma patients were analyzed. Among them, 17 died after admission. The average age of patients was 38,59 and 80% of them were male. There was no significant difference in mean age between patients who survived and died. The average time of hospitalization of patients who died was 5,32 days, while mean time of hospitalization of patients who survived was 25,89 days. 2 left the hospital at theirs's own request, and 15 continued treatment other than in the outpatient department. Injury Severity Score (ISS) was calculated for every patient. An average ISS was 35,1 among all patients, 28,85 among survivors, and 52 among deaths. Causes of death were: multiorgan injury (8 patients), craniocerebral injury (8 patients), undefined (1 patient). The most common cause of injury were traffic accidents and falls from the altitude.
Conclusions: Most of the patients with polytrauma are young and middle-aged men. None of the patients who survived had more than 50 points in ISS. Patients who were admitted to the Intensive Care Unit (ICU) had the longest hospitalization time while those in surgery department were discharged earlier.
Keywords: polytrauma, multiorgan injury, high-energy accidents

Pediatrics, Neonatology

Jury:

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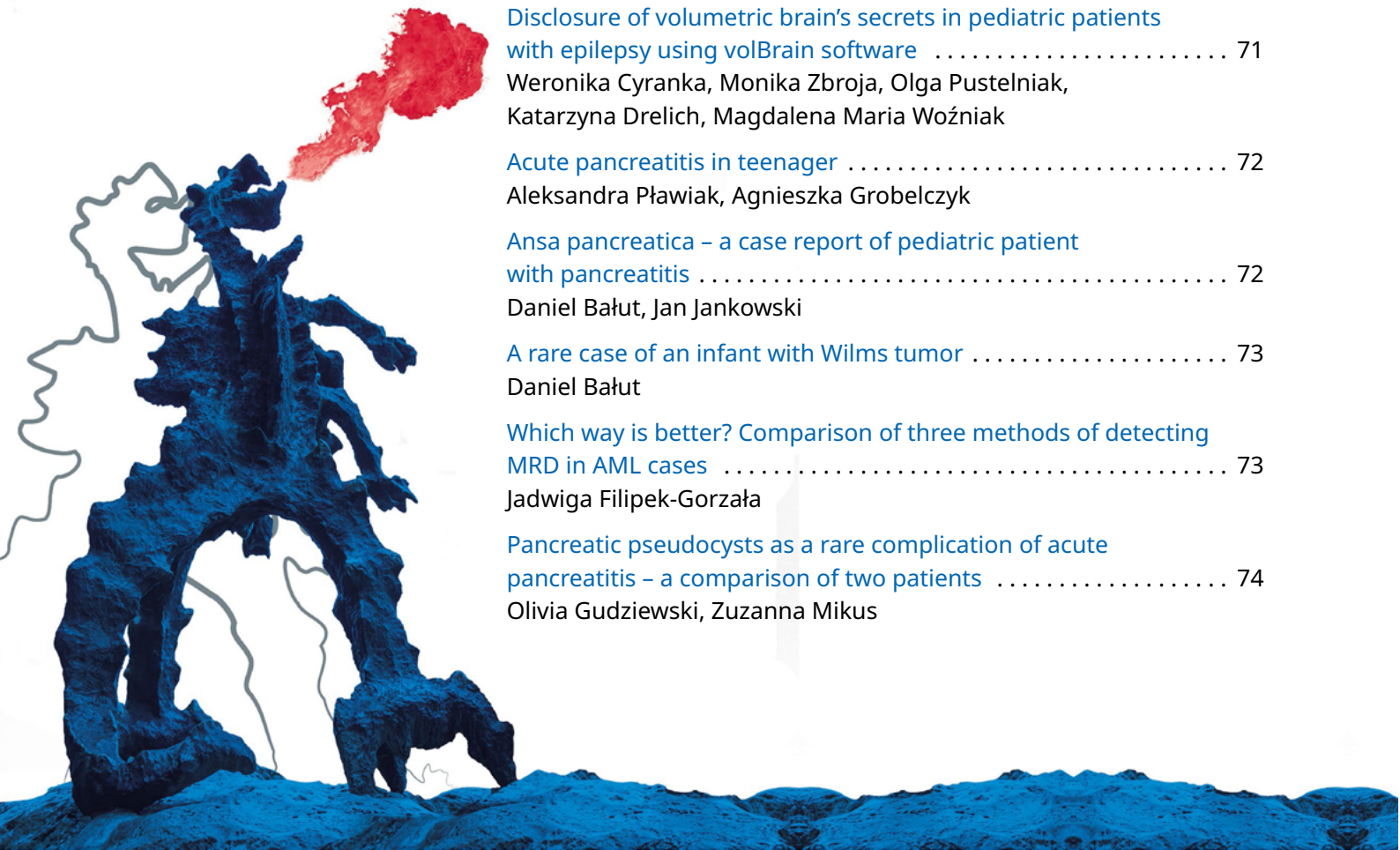

Novel SPINK5 gene mutation in Netherton Syndrome: case report

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Trustee: Anna Szaflarska, MD

Introduction: Netherton Syndrome is a rare autosomal recessive inborn error of immunity characterized by ichthyosiform erythroderma, trichorrhexis invaginata (pathognomonic „bamboo hair"), immunological disturbances and atopic conditions.
Results: We report a case of female patient with diagnosis of Netherton Syndrome based on indicative symptoms with confirmed pathogenic substitution in exon 17 of SPINK5 gene. K. was born with severe desquamation of epidermis, mainly head and big joints areas, and erythroderma, especially in diaper area. In her first month of life she developed sepsis (2 times) and infection of urinary tract. Parameters of her humoral and cellular immunity were normal, apart from slightly elevated IgE level and the number of NK cells. She presented bilateral hypoacusis, failure to thrive and hypotonia. In infancy she suffered from acute RSV bronchiolitis and rotaviral gastroenterocolitis . Both infections were with hypoalbuminemia and ionic disturbances. Apart from that she had lymphadenopathy in both axillary fossae and there were properties of bronchopulmonary sequestration of 9th segment in right lung.
Conclusions: Uniqueness of this case is a novel SPINK5 mutation detected in patient. Worth mentioning is successful application of subcutaneous immunoglobulin therapy instead of conventional intravenous immunoglobulin preparates. Unlike other described patients with Netherton syndrome, she has bilateral hypoacusis and developmental retardation.
Keywords: netherton syndrome, new mutation, bilateral hipoacusis, failure to thrive, subcutaneus immunoglobulin therapy

Impact of COVID-19 on Pediatric-out-of-hospital cardiac arrest in the masovian region

Jaroslaw Meyer-Szary, Milosz J. Jaguszewski, Jacek Smereka, Aleksandra Gasecka, Mohamed S. Emam, Ivo John, Zubaid Rafique, Frank W. Peacock, Francesco Chirico, Dorota Sagan, Marta Jachowicz, Lukasz Szarpak
Warsaw Medical University

Trustee: Aleksandra Gasecka, MD

Introduction: Paediatric out-of-hospital cardiac arrest (OHCA) has annual occurrence rates estimated at 7–8 per 100 000 children with extensive variation depending on the location and timing of the study, such data even decreased during COVID-19 period.
Aim of the study: We aimed to examine the changes in the characteristics and survival outcomes of paediatric OHCA following the COVID-19 outbreak in the Masovian region (Poland).
Material and methods: We conducted a retrospective cohort study based on a National Emergency Medical Service (EMS) database in Poland. It was conducted according to the STROBE guidelines and the declaration of Helsinki. All eligible consecutive paediatric patients suffering an OHCA from March 1 to December 30 in the years 2019 (pre-pandemic period) and 2020 (pandemic period), were enrolled. Children eligible for inclusion were > 48 hours and < 18 years of age and suffered an OHCA with paediatric advanced life support implementation by EMS teams. Subjects were excluded if the information on gender or cardiopulmonary resuscitation outcomes was missing.
Results: Forty-seven paediatric OHCA patients were included in the pre-COVID-19 and 29 in the COVID-19 periods. Children with OHCA in the COVID-19 period more often received an endotracheal tube compared to the pre-COVID-19 period, although the use of a supraglottic airway device did not change. The use of intraosseous access decreased during the COVID-19 period. The outcomes were similar in the categories of 'death in the field', 'transported with ongoing CPR', and 'transported with ROSC.
Conclusions: To conclude, there were no significant changes regarding outcomes, demographics, and field resuscitation rates between pre-COVID-19 and COVID-19 periods, despite an increase rate of endotracheal tube intubation. Although the COVID-19 pandemic may have increased the number of OHCA, but has not changed the patient characteristics or outcomes.
Keywords: out-of-hospital cardiac arrest, OHCA, pediatric, SARS-CoV-2, COVID-19

Disclosure of volumetric brain's secrets in pediatric patients with epilepsy using volBrain software

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Introduction: Epilepsy is the most common childhood neurological disease. There are approximately 50 million people suffering from it in the world. Magnetic resonance imaging is the method of choice in the diagnosis and monitoring of patients with this disease.
Aim of the study: The aim of the study was to evaluate anatomic structures' volume of the brain in pediatric patients with epilepsy.
Material and methods: 50 consecutive patients (study group) suffering from epilepsy, and 30 healthy patients (control group) aged 1-17 years, who underwent head MR examination without contrast agent administration between 2018 and 2021 at the Children's Hospital of the Medical University of Lublin in Poland. Individual anatomical structures of the central nervous system were analyzed based on T1-weighted 3D isometric 1 mm sequence and volume changes of spe-

cific structures were compared between the epilepsy group and the control group. Images were evaluated by volBrain software.
Results: In the study group, the ratio of brain tissue to CSF was 89,34% to 10,66% , in the control group it was 90,70% to 9,30%. In the research group compared to the control group, the mean volume of each brain structure was: cerebrum – 78,19%/79,22%, cerebellum – 9,72%/9,98%, caudate – 0,54%/0,54%, lateral ventricle – 1,18%/0,52%, thalamus – 0,84%/0,89%, putamen – 0,63%/0,66%, accumbens – 0,04%/0,05%, hippocampus – 0,47%/0,51%, globus pallidus – 0,19%/0,18%, amygdala – 0,11%/0,11%.
Conclusions: During the course of epilepsy in pediatric patients, there is a decrease in the volume of brain tissue. Magnetic resonance imaging and the volumetric evaluation performed on its basis have important clinical and prognostic significance, but need to be confirmed on a large study group with taking into account changes in the volume of anatomical structures of the brain in relation to age and disease duration.
Keywords: epilepsy, volumetric analysis, MR imaging

Acute pancreatitis in teenager

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Introduction: In everyday pediatric practice, acute pancreatitis is not a common diagnosis – it occurs with a frequency of 10-15 / 100,000 among children under 18 years of age.The basis for the diagnosis of acute pancreatitis is the fulfillment of ≥2 out of 3 criteria: the presence of clinical symptoms (sudden, sharp pain and tension of the epigastric integuments), increase in laboratory indices (amylase or lipase in serum, urine or peritoneal fluid ≥3 upper limit of normal), a typical picture in radiological evaluation (ultrasound or CT). It is also necessary to exclude other possible causes.
Results: A 16-year-old boy was referred by a primary care physician to the Hospital Emergency Department due to the patient reported severe, undefined abdominal pain. In the medical history, the patient had normal stools, did not vomit or reported diarrhea. The systolic pain was localized in the epigastrium and middle mesogastrium. Laboratory tests: hyperbilirubinemia, slightly elevated amylase levels, high CRP and D-dimers, other results without significant abnormalities. In the first USG with no evidence of AP, a small amount of free fluid was found in the vesicorectal recess. Broad-spectrum antibiotic therapy was introduced – with no evident improvement. The unclear picture of the ailments was the reason for extending the diagnosis to include a CT scan, which revealed the features of moderate / severe acute pancreatitis mainly in the pancreatic tail with fluid spaces in the peritoneal and left pleural cavities. Control tests showed an increase in pancreatic parameters and transaminases. Antibiotic therapy was modified, a strict diet, proton pump inhibitors, somatostatin, analgesic treatment as well as parenteral nutrition and parenteral hydration were introduced. After 10 days of intensive treatment, due to a significant improvement, including the results of laboratory tests and imaging, oral nutrition was gradually introduced – initially only carbohydrates, then a fat-free diet. The patient was discharged home in good general condition and a scheduled MRI examination of the abdominal cavity was recommended (observation of the final regression of fluid collections and possible pseudocyst formation).
Conclusions: Any abdominal pain localized in the left epigastric / mid-abdomen should be carefully diagnosed, starting with a thorough history and ending with laboratory tests, as it may be a symptom of a serious, life-threatening disease. Frequent ultrasound control allows you to observe even discrete, quick changes in the abdominal cavity, caused by an ongoing acute infection.
Keywords:

Ansa pancreatica – a case report of pediatric patient with pancreatitis

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Introduction: Ansa pancreatica (AP) is a rare anatomical variant of pancreatic ducts. The frequency of it is 0.25-1.1% among adults who had an imaging of bile ducts performed and 3-3.4% among children with recurrent pancreatitis. We reviewed all 19 cases of AP using Medline and Embase. Only one case concern pediatric patient. We would like to present a case report of boy from our Department with AP.
Results: 12-years-old male patient was admitted to the hospital in due to recurring episodes of pancreatitis. In magnetic retrograde cholangiopancreatography (MRCP) was described an anatomical variant – ansa pancreatica. The other potential causes of chronic pancreatitis were excluded: no predisposing mutations of genes were found; the lipid panel, level of calcium and immunoglobulin G4 (IgG4) were correct; alpha-1 antitrypsin deficiency, cholelithiasis and coeliac disease were excluded; no medication and stimulants were noticed. During endoscopic retrograde cholangiopancreatography (ERCP) sphincterotomy and stent positioning were performed. During the 19-months observation, the stent was replaced in gradually increasing diameter every 3-4 months. The patient was still asymptomatic between hospitalizations. In follow-up no strictures of the main pancreatic were described in ERCP; the stents were removed. To date, the patient has had no recurrence of pancreatitis.
Conclusions: AP may be related to pancreatitis in children. MRCP is a diagnostic tool for AP. ERCP may be a diagnostic as well as therapeutic procedure in children suffered from pancreatis. Further research is needed.
Keywords: ansa pancreatica, pancreas, pediatric, pancreatitis

A rare case of an infant with Wilms tumor

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Introduction: Wilms tumor (nephroblastoma) is the most common renal cancer among children. In Poland there are reported about 70-80 new cases yearly. It can have various symptoms, the most important is bump in abdomen. Others include haematuria or erythrocyturia, rarely impairment of urine flow and associated with urinary tract infections. Due to the risk of dissemination, biopsy of the kidney to confirm the cancer isn't performed during diagnosis. The most important tool is methods of diagnostic imaging such as ultrasound, renal scintigraphy and abdomen CT. According to SIOP (International Society of Paediatric Oncology) guidelines, recommended method of treatment of Wilms tumor includes pre- and postoperative chemotherapy, radiotherapy and surgery of removal of remains of the tumor and visible lymph nodes.
Results: 4 months old girl was admitted to Nephrology Clinic due to abnormal ultrasound (US) findings in the left kidney. In controlled US, performed a month later, enlarged pyelocalyceal system was observed again and vascularized homogeneous structure sized 12x9x7mm in the pelvis. When she was 3 months old, renal scintigraphy was performed and revealed possible cyst or other lesion in the left renal hilum which caused partially difficulties in outflow from its superior calyx. The patient was consulted during multidisciplinary meetings, but a structure in kidney didn't arouse oncologic suspicion. At the age of 9 months abdomen CT was performed and showed enlargement of the structure to 26x20x28 mm and enlargement of the pyelocalyceal system to 10-12 mm. The structure filled the left renal hilum completely, it was quite homogeneous, without calcifications, moderately homogeneously contrast enhanced and renal pelvis pressured. Due to the suspicion of Wilms tumor preoperative chemotherapy was started. 4 weeks later left nephrectomy was performed. In histopathological examination nephroblastoma was confirmed. Chemotherapy was continued for next 6 months. Currently a girl is 6 years old. Her controlled abdomen US is normal. The right kidney is compensatively overgrown and has proper echostructure and thickness of renal parenchyma and without enlargement of the pyelocalyceal system.
Conclusions: Wilms tumor is diagnosed most often in children between 1 and 4 years old and very rarely below 6 months old. A tumor localizes usually around the pole of the kidney, however our patient had it in the middle of the renal pelvis. US plays key role in early diagnosis of tumors among children.
Keywords: nephroblastoma, Wilms tumor, pediatric oncology, infant

Which way is better? Comparison of three methods of detecting MRD in AML cases

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Introduction: Measurable residual disease (MRD) refers to leukemia cells resistant to chemotherapy. MRD is an independent prognostic factor in acute myeloid leukemia (AML), however there are several ways to analyze MRD. Based on multicolor flow cytometry (MFC) residual cells can be traced by leukemia-associated immunophenotype (LAIP) or different-from-normal (DfN) approach. Another approach is to track progenitor compartment disturbances, including leukemia stem cells (LCS) fraction.
Aim of the study: The aim of this research is to determine clinical relevance of assessing MRD by means of MFC using different approaches, taking into comparison only patient who suffered relapse.
Material and methods: The patient group consisted of 17 children who suffered from AML, followed by relapse in years 2016-2021. We analyzed FCM data obtained at the day of diagnosis, at control time-points and relapse. We applied 3 approaches: determination LAIP of major clone of leukemic cells at diagnosis and prospective tracking this population; comparing immunophenotypic shifts of relapsed cells versus day of diagnosis, and tracing such cells retrospectively; looking for antigen aberrations in progenitor compartment including LSC.
Results: In most cases MRD was assessed as positive at least in one time-point, but in some cases MDR was determined as negative. Immunophenotypes of blasts from relapse compared to diagnosis altered in all cases. There were averagely 10 kind of changes: loosing of antigen (Ag), emerging new abberant Ag, increase or decrease of Ag expression density. Reanalysis of samples based newly established relapse immunophenotype in 5 cases gave higher MRD values, indicating that some leukemic cells were omitted in original analysis, despite they were still of aberrant phenotype, not present in normal BM samples (DfN). In all cases progenitor compartment displayed aberrancies.
Conclusions: MRD detection has irreplaceable role in AML treatment monitoring. We recommend combining LAIP with DfN approach as well as assessing shifts in progenitor compartment to predict leukemia relapse as early as possible.
Keywords: acute myeloid leukemia, measurable residual disease, flow cytometry, leukemia-associated immunophenotype, different- from-normal

Pancreatic pseudocysts as a rare complication of acute pancreatitis – a comparison of two patients

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Introduction: Pancreatic pseudocysts are relatively uncommon in children. Treatment tends to be individualized, with some patients undergoing endoscopic methods and others needing surgical management. This case study aims to present two pediatric patients that presented to our hospital with pancreatic pseudocysts and compare their clinical presentations, management and outcomes.
Results: Both patients presented to the Department of Paediatric Gastroenterology and Nutrition at the Medical University of Warsaw with unremitting abdominal symptoms, loss of appetite and nausea as well as a history of acute pancreatitis. Patient A – 12 y.o female, and Patient B – 11 y.o female. Patient A – imaging tests revealed a giant cystic lesion over 20 cm in diameter. Due to the rapid deterioration of the patient's condition (deteriorated pain control, disturbed consciousness, high inflammatory markers, d-dimers, respiratory failure, hyperglycemia) the patient was admitted to the ICU, where she required intensive analgesic treatment. The patient suffered from ongoing hyperglycemia and was operated endoscopically to drain the cyst. After the procedure, the borders of the cyst reduced which allowed for the removal of the gastrostomy 2 months later. Patient B – MRI showed 2 cysts (60x52x26 mm and 154x98x127 mm). As no pressure of the cyst on the stomach wall was visualized during gastroscopy, ERCP was performed as an attempt to drain the cyst from the pancreatic ducts. The procedure failed due to scarring of the pancreatic duct and surgical removal was initiated which included removing the cyst along with the body and tail of the pancreas and the spleen.
Conclusions: Pancreatic pseudocysts, although rare in children, require an individualized approach and can be challenging to manage. The least invasive method is decompression using cystogastrostomy, however, surgery may be required in more complicated cases. Both patients presented in this case were treated using different approaches, but both had successful recoveries.
Keywords: Pediatrics, Gastroenterology, Pancreatic Pseudocyst, Gastroscopy, Gastrostomy, ERCP

Is our understanding of thymic development complete? A case of retropharyngeal ectopic thymus in a pediatric patient with 22q11.2 deletion syndrome

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Trustee: Prof. Stanisław Kwiatkowski, MD, PhD

Introduction: The thymus gland plays a crucial role in the maturation process of lymphocyte T cells. Developmental disorders of this organ might be caused by genetic diseases, such as the 22q11.2 deletion/DiGeorge syndrome. Other manifestations of this condition are heart defects, reduced number of T cells, hypocalcemia and face dysmorphia.
Results: A 13-year-old boy with 22q11 deletion syndrome presented with paresis and paresthesia of the right upper extremity. Magnetic resonance imaging (MRI) revealed a solid mass in the retropharyngeal, prevertebral area. The lesion was excised and, upon histopathological examination, turned out to be ectopic thymic tissue. Follow-up examination showed no recurrence of the lesion.
Conclusions: The ectopic thymus is a rare pathology, especially in 22q11 deletion syndrome patients. In general, thymic tissue can be found anywhere along the normal path of its descent; in this case, however, its location cannot be explained solely by its embryological origin, as at no point should thymus or its histological predecessor be located in the retropharyngeal area. As such, this finding challenges our current understanding of thymic embryological genesis.
Keywords: Retropharyngeal, ectopic, thymus, DiGeorge, 22q11.2

The rarest of the rare – a case report of a 10-month-boy diagnosed with Ogden syndrome

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Trustee: Aleksandra Jezela-Stanek, MD PhD DSc, Assoc. Prof

Introduction: The definition of ultra-rare disease in terms of its prevalence varies between the sources, usually amounting to ca. 1 in 1.000.000 births. Nonetheless, there are even less frequent disorders, such as Ogden syndrome, which up to this day was diagnosed in less than 30 patients worldwide. They present typically with variety of developmental defects, including postnatal growth retardation, psychomotor delay and hypotonia. This disorder is caused by the hetero- and homozygous mutations in NAA10 gene, which encodes N-alpha-acetyltransferase 10, involved in protein biosynthesis.
Results: We present a case of a Polish male infant, born in 39. GW with c-section due to the pathological CTG signal and

the presence of green amniotic fluid. Hypotrophy (2400 kg) and facial dysmorphism were discovered in the physical examination. From the first minute the child required mechanical ventilation – a nasal continuous positive airway pressure. First 27 days the patient was treated in a neonatal intensive care unit, where a series of examinations were conducted. On their basis the presence of following defects was determined: atrial and ventricular septal defects, patent ductus arteriosus, hydrocephalus, pectus excavatum, serpentine feet and axial hypotonia. Child was then consequently referred to the genetic clinic for counseling. Results of the tests allowed the diagnosis of Ogden syndrome. In the following months the patient's condition worsened due to the numerous pulmonary infections and decreasing functionality of the cardiovascular system. Despite the advanced treatment including the variety of medications, the patient eventually died in February 2022.

Conclusions: This case report underlines how important for the adequate diagnostic process of ultra-rare diseases is the awareness and inquisitiveness of medical professionals. It is crucial to take into account the presence of characteristic defects, which indicates the necessity of finding the factor causing the condition. This knowledge is in turn crucial for appropriate neonatologic and paediatric care.

Keywords: Ogden syndrome, neurodevelopmental disorder, congenital heart defects, rare disease, genetic disease

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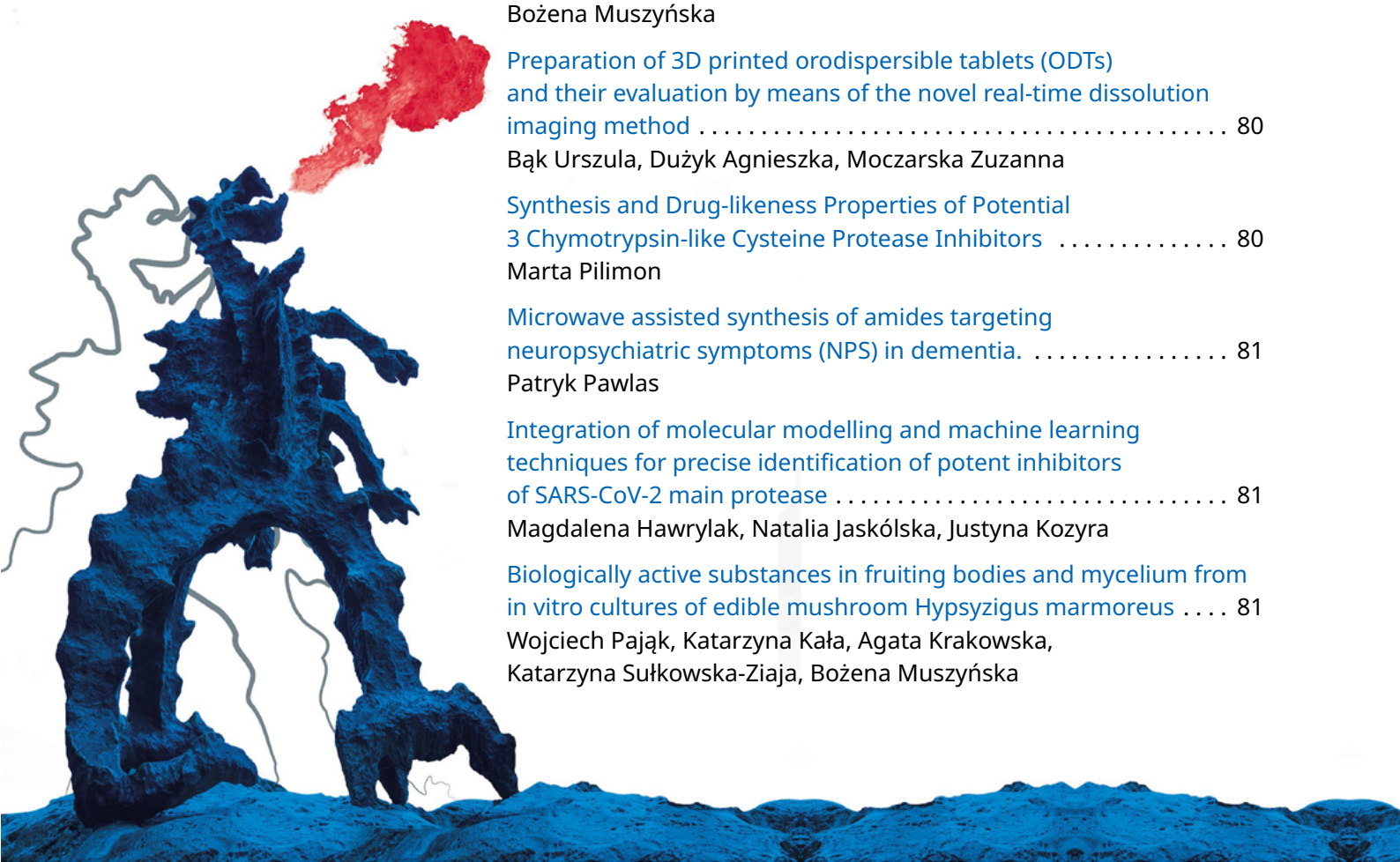

HBK-15 improves scopolamine-induced memory deficits in mouse tests assessing cognitive function

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Trustee: dr Szczepan Mogilski MD PhD, Prof. Karolina Pytka, MD, PhD

Introduction: Depression is a mental disorder that affects about 300 million people worldwide and can contribute to their disability. In particular, the cognitive deficits often reported by patients worsen the prognosis of treatment and the disease itself. Therefore, it is important to look for antidepressant compounds with a procognitive component. The compound HBK-15 showed a fast antidepressant-like effect in rodent models of depression. However, its influence on learning and memory processes is still unknown.
Aim of the study: We aimed to investigate the ability of HBK-15 to reverse scopolamine-induced memory and learning impairments in mouse tests.
Material and methods: Adult male CD-1 or C57BL/6 mice were injected intraperitoneally with saline (control) or HBK-15 at different doses (0.3-2.5 mg/kg). Memory impairment was induced by subcutaneous administration of scopolamine (1mg/kg). The Morris water maze test was used to determine the influence of HBK-15 on spatial memory, and the novel object recognition test to assess the effect on recognition memory.
Results: A significant increase in time to explore a new object was observed in the three groups of subjects injected with HBK-15 (0.625-2.5 mg/kg). We observed an inverted-U-shaped effect of HBK-15 in the Morris water maze test, the compound significantly reduced the time taken by mice to enter the platform compared to the control group at doses of 0.625 and 2.5 mg/kg, whereas a dose of 1.25 mg/kg showed no such effect.
Conclusions: The tested compound improved learning ability and reversed scopolamine-induced recognition memory impairment. As for spatial memory, HBK-15 showed a non-linear effect, which is not uncommon in behavioral studies but is difficult to explain due to its multifactorial nature. Given the promising results, the effect of HBK-15 on learning and memory processes requires further studies.
Keywords: depression, HBK-15, memory, novel object recognition, Morris Water Maze test,

Cordyceps militaris as a source of elements with therapeutic activity

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Introduction: Medicinal mushrooms are o good source of bioelements both fruiting bodies and mycelium from in vitro cultures. Cordyceps militaris (L.) Link is one of medicinal mushroom commonly used in dietary supplements with many health-promoting properties such as antioxidant, antitumor, immunostimulatory, anti-inflammatory, cardiotonic and ergogenic.
Aim of the study: The aim of the study was to compare the content of bioelements in mycelium of C. militaris, fruiting bodies from own cultivations and commercially available, and dietary supplements. The next aim of the research was the determination of the amount of bioelements after extraction into artificial digestive juices.
Material and methods: The research materials of C. militaris used for the analysis were divided into two categories: purchased and self-cultivated (mycelium from in vitro cultures and fruiting bodies) in order to compare their quality. The samples were subjected to wet mineralization in the closed system in a Magnum II device, using 6 mL of 65% HNO3 and 2 mL of 30% H2O2 solution. The concentrations of selected bioelements were determined in the mineralized materials by atomic absorption spectrometry (FAAS, spectrometer – iCE 3500, Thermo Scientific, UK).
Results: In the case of mushroom material, the best source of Ca, Cu, and Mg was the dietary supplement 2 (500, 2.95, 817 mg/100 g d.w., respectively). In turn, the richest source of Fe turned out to be mycelial cultures (9.36 mg/100 g d.w.), while K, Mn, Na and Zn (2025, 2.89, 1886, 16.2 mg/100 g d.w., respectively) were commercially available fruiting bodies. The content of bioelements determined in the initial material analysis turned out to be significantly higher than after digestion
Conclusions: Each of the analyzed materials – both from own cultivation and commercially available, was characterized by high content of bioelements and could be used for human organism supplementation.
Keywords: medicinal mushroom, bioelements, extraction into artificial digestive juices

Preparation of 3D printed orodispersible tablets (ODTs) and their evaluation by means of the novel real-time dissolution imaging method

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Introduction: Three-dimensional printing (3DP) is a fast-developing pharmaceutical technology. At the design stage in 3D modeling software, there is a possibility to affect tablet properties by creating different spatial structures to obtain fast disintegrating tablets. The novel surface dissolution imaging instrument (Pion SDi2) enables real-time observation of the tablet disintegration and dissolution processes.
Aim of the study: The purpose of the study was to produce ODTs by fused deposition modelling (FDM) and analyze the effect of the spatial structure of printed tablets on the disintegration times and the dissolution profiles of fluconazole using SDi2.
Material and methods: Tablets were printed using the FDM technique from a drug-loaded filament containing 30% fluconazole as the model drug and poly(vinyl alcohol) as the filament-forming matrix. Three kinds of tablets with different spatial structures were printed and analyzed. To verify the properties of each designed spatial structure, the pharmacopeial (PhEur) disintegration and the dissolution flow-through tests were performed using the surface dissolution imaging instrument (Pion SDi2) connected online to the spectrophotometer (Shimadzu UV-1800) to determine the amount of fluconazole released.
Results: All printed tablets disintegrated within 6 minutes. Moreover, one spatial structure met the pharmacopeial requirements for ODTs and disintegrated within 3 minutes (1 min 55 sec). All printed tablets met the pharmacopeial dissolution requirements for uncoated tablets – more than 80% of API was released after 30 minutes. The images collected by SDi2 showed differences between the disintegration and the dissolution processes depending on the spatial shape of the tablet.
Conclusions: The tablet spatial structure had an impact on the time of dissolution and disintegration. The surface dissolution imaging instrument (Pion SDi2) enabled us to the real-time observation of the dissolution and disintegration processes.
Keywords: 3D printing, fused deposition modelling, orodispersible tablets, surface dissolution imaging, fluconazole

Synthesis and Drug-likeness Properties of Potential 3 Chymotrypsin-like Cysteine Protease Inhibitors

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Introduction: 3-Chymotrypsin-like cysteine protease (3CL-pro) is an enzyme that is crucial for viral replication. It is the main protease present in coronaviruses, such as severe acute respiratory syndrome coronavirus – SARS-CoV-1 and SARS-CoV-2, and due to that fact, it is an attractive drug target for COVID-19 disease. Paxlovid is an example of a successfully developed 3CLpro inhibitor used in COVID-19. Nevertheless, paxlovid is only approved for use in patients with mild to moderate symptoms onset of COVID-19, so there is an unmet need to look for newer 3CLpro inhibitors with better physicochemical parameters.
Aim of the study: The aim of the study was to develop a method for the synthesis of 3CL-protease inhibitors and to evaluate their drug-likeness properties.
Material and methods: Based on virtual screening, potential 3CLpro inhibitors were selected and their drug-likeness properties were determined using an online tool – SwissADME website. The compounds were synthesized within two different pathways: the condensation of phthalic anhydride and appropriate amines in the presence of glacial acetic acid, and isoquinoline-3-carboxylic acid amides were prepared using coupling agents such as DCC and HOBt. All the final compounds were purified by column chromatography.
Results: SwissADME online tool prediction is based on six physicochemical properties (lipophilicity, size, polarity, solubility, flexibility, and saturation) relevant to ADME parameters. All synthesized compounds showed good drug-likeness properties. Moreover, efficient methods were developed to synthesize potential 3CLpro inhibitors with average-to-good yields (55–84%).
Conclusions: The best potential 3CLpro inhibitors with good drug-like properties may in the future become effective oral medications for the treatment of coronavirus-related diseases. This project was co-financed by the Polish National Agency for Academic Exchange, grant PPN/BIT/2021/1/00056/U/00001.
Keywords: synthesis, drug-likeness properties, 3CLpro, COVID-19

Microwave assisted synthesis of amides targeting neuropsychiatric symptoms (NPS) in dementia.

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Introduction: Neuropsychiatric symptoms (NPS), such as psychosis, depression, and anxiety are frequently observed among patients with dementia. Even though the evidence for the effect of psychotropics is limited, the combination of antipsychotics and antidepressants is the most frequently used option in dementia patients. Considering the above, there is an unmet need for a well-tolerated and effective therapy of NPS in dementia.
Aim of the study: The aim of the study was to find the best way to synthesize a new compound with an amide bond targeting neuropsychiatric symptoms (NPS) in dementia with the use of microwave radiation.
Material and methods: Substrates of the reactions were 2-(carboxymethyl)-1-methyl-1H-pyrrole-3-carboxylic acid and several ethylamine derivatives. As activators of an acid group, there were used TBTU, HBTU, HOBt, CDI, or DCC. Microwave-assisted synthesis was performed in the laboratory microwave Discover LabMate reactor (CEM Corporation). Reaction mixtures were being radiated at room temperature, then were thickened. A yield of reactions was determined using liquid chromatography-mass spectrometry (LC-MS).
Results: The best way to synthesize amides with the use of microwave radiation turned out to be the method D in which there was used HBTU as an acid group activator and triethylamine (TEA) in dichloromethane as a solvent. After 1h of radiation, there were received products with the highest yield. Thanks to this, microwave radiation could be used to speed up chemical reactions.
Conclusions: Microwave-assisted synthesis of new amides targeting neuropsychiatric symptoms (NPS) in dementia using the method D could be used in drug discovery and development.
Keywords: neuropsychiatric symptoms, microwave-assisted synthesis

Integration of molecular modelling and machine learning techniques for precise identification of potent inhibitors of SARS-CoV-2 main protease

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Trustee: Jakub Jończyk, MD, PhD,
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Introduction: COVID-19 has become one of the greatest health challenges that humanity is constantly struggling with. Despite the mobilization of the scientific community and the development of vaccines, there is still an urgent need for new, effective therapeutics. The development of SARS-CoV-2 main protease (Mpro) inhibitors is a prime target of drug-discovery efforts. The use of computational methods to find patterns that can indicate compounds with desired activity can efficiently accelerate future research.
Aim of the study: The study aimed to develop a virtual screening protocol that will allow us to evaluate the ability of diverse ligands to inhibit SARS-CoV-2 Mpro and bring us closer to the discovery of potent inhibitors.
Material and methods: To build the models, we used a group of 8702 ligands with known activity expressed as a percentage of SARS-Cov-2 Mpro inhibition derived from the ChEMBL database. We prepared three models assigning compounds as active (percent inhibition> 80%) and inactive. The first one was based on molecular descriptors generated by Padel software and classification with decision trees. The second model was based on pharmacophores prepared with the LigandScout software. The last model was prepared by molecular docking with the Glide from Maestro – Schrödinger. The best models were used to prepare the screening protocol.
Results: We used the ROC curves to evaluate the diagnostic ability of the obtained models. The best models had high AUC values of 0.81. This indicates a significant advantage of true positive predictions against false positive ones.
Conclusions: Taking into account the high diversity in the structure of the compounds used to build the models and the promising results of their validation, the proposed virtual screening protocol can be successfully applied in the search for new SARS-Cov-2 Mpro inhibitors. The project is co-financed by the Polish National Agency for Academic Exchange, grant PPN/BIT/2021/1/00056/U/00001
Keywords: COVID-19, SARS-CoV-2, Mpro, molecular modelling, machine learning, virtual screening

Biologically active substances in fruiting bodies and mycelium from in vitro cultures of edible mushroom Hypsyzigus marmoreus.

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Introduction: Hypsizigus marmoreus (buna shimeji) has been identified as a source of many biological substances such as carbohydrates, proteins, bioelements, amino acids, lectins, terpenoids, tocopherols, and vitamins. This species has become increasingly popular due to its pharmacological activities.
Aim of the study: The aim of the study was to determine the content of lovastatin, ergothioneine and bioelements in

mycelium from in vitro cultures and fruiting bodies of H. marmoreus (from own and commercial cultivation). The subject of the work was also the comparison of different mushroom material types to assess their potential anti-atherosclerotic and antioxidant activity.
Material and methods: The research materials were lyophilized, homogenized and then used to obtain methanolic extracts. The analyzes of lovastatin and ergothioneine were performed using a high-performance liquid chromatography (HPLC) method. To determine bioelements the materials were subjected to microwave mineralization process, using 65% HNO3 and 30% H2O2 solutions. The bioelements were determined by flame atomic absorption spectrometry (FAAS). The content of all analyzed substances was expressed in mg/100 g dry weight.
Results: The best source of lovastatin (74.5 mg/100 g d.w.) turned out to be white variety of H. marmoreus from commercial cultivation, while in the case of ergothioneine (73.0 mg/100 g d.w.) and Cu, Fe, Mg, Mn, and Zn (3.5, 9.1, 325.4, 6.4, 17.4 mg/100 g d.w., respectively) the mycelium from in vitro cultures of the brown variety was its competitive source. The addition of Mg and Zn to the medium increased their accumulation in mycelium, nevertheless especially the level of lovastatin was lowered.
Conclusions: H. marmoreus turned out to be a mushroom with potential anti-atherosclerotic and antioxidant activity. It has been shown that the mycelial cultures and fruiting bodies obtained on appropriate media can be a source of important substances for the human body.
Keywords: Hypsyzigus marmoreus, lovastatin, ergothioneine, bioelements, therapeutic potential

Stimulated production of triterpenes and sterols using methyl jasmonate and cytotoxicity evaluation of the extracts from mycelial cultures of Ganoderma applanatum (Pers.) Pat

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Trustee: Katarzyna Sułkowska-Ziaja, Assistant Professor, MD, PhD, Agnieszka Galanty, MD, PhD, Katarzyna Kała, MD, PhD, Prof. Bożena Muszyńska MD, PhD

Introduction: Triterpenes and sterols revealed in medicinal mushroom fruiting bodies and accumulated in biomass from mycelial cultures possess a high health promoting potential: anticancer, anti-inflammatory, or antimicrobial activity.
Aim of the study: The study aimed to investigate the effect of methyl jasmonate (MeJa) elicitation on increasing the production of triterpenes and sterols in aerated mycelial cultures of arboreal species – G. applanatum. In addition, the cytotoxicity to selected lines of cancer cells (melanoma, prostate) of the extracts was determined.
Material and methods: The object of the study was the mycelial cultures carried out on a modified liquid medium according to Oddoux. Two variants of elicitation were tested: the addition of MeJa on the fifth and tenth day of the 20-day growth cycle. The DAD-HPLC method was used for qualitative and quantitative determination of chemical compounds. The cytotoxic activity of the extracts tested was measured with the LDH viability test.
Results: A significant increase in the content of ganoderic acid, ergosterol and ergosterol peroxide was demonstrated in the biomass after MeJa elicitation on the fifth day of the growth cycle at a concentration of 150 μM/100 mL of the culture medium (compared to control samples). Mycelium extracts (obtained after elicitation) exhibited significant cytotoxic activity against prostate cancer cells and moderate effect on melanoma cells (compared to control samples).
Conclusions: Mycelial cultures of G. applanatum can be proposed as a model for research on the dynamics of the accumulation of triterpenes and sterols – structures with recognized anticancer activity.
Keywords: medicinal mushrooms, mycelial cultures, ganoderic acid A, elicitation

Development of pharmaceutical gummies with modified release microparticles

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Trustee: Witold Brniak, MD, PhD

Introduction: The problems associated with administering the drug to geriatric and pediatric patients are one of the biggest challenge of modern pharmacotherapy. To overcome difficulties in swallowing, many different dosage forms are developed, including pharmaceutical gummies. Ketoprofen is available in forms of tablets and capsules which may be hard to swallow or in forms for reconstitution to solution which may be irritable to the gastric mucosa. This makes its administration to some patients very difficult. Pharmaceutical gummies can facilitate the administration while coated microparticles may lower the risk of gastric irritation.
Aim of the study: The study aimed to formulate pharmaceutical gummies with enteric coating microparticles containing ketoprofen.
Material and methods: Enteric microparticles were prepared by melting ketoprofen with shellac and by its granulation with Eudragit FL30D. The microparticles with better dissolution properties were used for the preparation of gummies. The dissolution test was performed for microparticles and gummies with an apparatus type II in 0,1 mol/L HCl for 1 hour and in phosphate buffer pH = 7,0 for 1 h. The samples were assayed with UV-VIS spectrophotometer Shimadzu, UV-1900.
Results: Dissolution studies showed sufficient gastric resistance of microparticles with Eudragit FL30D, and poor properties in the case of shellac. In the case of Eudragit FL30D, 9,65% of ketoprofen was released to the HCl solution, and 94,14% to the phosphate buffer. Incorporation of microparticles to the gummies did not change significantly dissolution properties. The gummies were of good mechanical properties. Their complete disintegration time in water was 21 min 31 s.

Conclusions: The results of our study confirmed the possibility to formulate the gelatine-based gummies containing enteric coated microparticles with ketoprofen, which may be used in the future for the administration to children and elderly.
Keywords: ketoprofen, gelatine-based gummies, geriatric patients, pediatric patients, dysphagia

The photo-protective effect of materials used for the administration and storage of parenteral nutrition admixtures on stability of vitamins

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Introduction: Vitamins are an essential ingredients of total parenteral nutrition (TPN) admixtures. However, they are very susceptible to the light and oxygen. Our previous research have shown the significant differences in properties of polymeric materials used for storage and administration of TPN.
Aim of the study: The aim of this study was to evaluate the photo-protective effect of polymeric materials used for storage and administration of TPN on the stability of vitamin solutions.
Material and methods: Multivitamin solution was stored in two sets of syringes (transparent white, UV-protected orange and amber) and bags (standard ethyl vinyl acetate (EVA), multilayer and yellow UV-protected. One set was exposed to daylight for two weeks, while second was light-protected. The concentration of multivitamin solution was measured using Shimadzu UV-1900 spectrophotometer for two weeks (directly after preparation, after 24, 48, 72 hours and on day 7th, 9th, 11th and 14th).
Results: Significant differences were observed in the amount of remaining vitamin solution depending on the time and type of container in which the solution was stored. The concentration of remaining vitamins in orange and amber syringes was significantly higher than in transparent ones. In the case of bags, the longest stability was achieved when yellow bags were used. The worst ones were the single-layer EVA bags. The protective cover enhanced the stability only in the case of yellow bags and color syringes.
Conclusions: The results of our study have shown the significant differences in light protective properties of studied materials. These can lead to a different rate of oxidation and decomposition of vitamins in TPN, depending on the storage and administration materials used.
Keywords: parenteral nutrition, vitamins degradation, nutrition admixtures, light-protective polymers, multivitamin solutions

The content and bioavailability of organic compounds with pro-health importance in the Cordyceps militaris species

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Introduction: Cordyceps militaris is a mushroom from Cordycipitaceae family. It is a caterpillar species which parasitizes on pupae and larvae of various insects, especially moths. In vitro and in vivo researches have proven, that C. militaris has many health-promoting properties, such as anti-inflammatory, antineoplastic or antiviral. This species is under investigation on its value in prevention of civilization diseases.
Aim of the study: The aim of the study was to compare the content of bioactive, organic substances in fruiting bodies and mycelium of C. militaris. Another aim of the research was the examination of the amount of the biologically active compounds obtained after extraction into artificial digestive juices.
Material and methods: The research materials were mycelium from in vitro cultures of C. militaris and fruiting bodies obtained of them. The samples were prepared in a process of lyophilization and homogenization in an agate mortar. The process of extraction in digestive juices was conducted in apparatus, which imitated human gastrointestinal tract. The content of organic compounds was determined by HPLC (high performance liquid chromatography) method.
Results: Both mycelium and fruiting bodies contained a high amount of bioactive, organic substances such as indole and phenolic compounds, lovastatin, cordycepin, L-phenylalanine and ergothioneine. Most of the analyzed substances were also determined after extraction into artificial digestive juices.
Conclusions: Results obtained from analysis of chemical composition of C. militaris confirm its potential use in prevention of civilization diseases. It should be emphasized that mycelium from in vitro cultures and fruiting bodies of C. militaris can be a potential material that has dietary and therapeutic properties and can be a source of their supplementation for the human body. Nevertheless this subject requires more researches to prove this statement.
Keywords: Cordyceps militaris, cordycepin, artificial digestive juices, bioavailability

Antiamnesic properties of novel multi-target-directed ligands in the mouse model of scopolamine-induced memory impairments

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Introduction: Alzheimer's disease (AD) is a heterogeneous neurodegenerative disorder with a complex pathobiology. Viable therapeutic options for AD address aggregation and accumulation of amyloid-β, oxidative stress, loss of metal ion homeostasis, and a severe decrease in brain levels of neurotransmitter acetylcholine (ACh). These impairments within the central nervous system observed in AD patients affect cognitive functions such as memory, orientation and judgment. Importantly, three out of four currently approved anti-AD drugs exploit cholinesterase (ChE) inhibition, with view to restore cholinergic activity.
Aim of the study: Considering this, the present in vivo research aimed to assess potential memory-improving properties of novel multi-target-directed ligands (MTDLs), mainly cholinesterase inhibitors, in the mouse model of scopolamine-induced amnesia.
Material and methods: Four test compounds (1-4) were assessed for their ability to improve learning and memory in 3 behavioural tasks, namely novel object recognition, passive avoidance and Morris water maze tasks to establish their effect on recognition memory, fear-motivated (contextual) memory and spatial learning, respectively. In each task, these compounds were administered intraperitoneally at doses 1, 10 and 30 mg/kg, 60 min before the acquisition trial. To induce amnesia, subcutaneous scopolamine (1 mg/kg) was used.
Results: In the novel object recognition task all four compounds at each dose tested significantly ($p < 0.001$) improved recognition memory of scopolamine-treated mice. In the passive avoidance task the compound 3 was effective at the dose 10 mg/kg ($p < 0.05$), whereas the compound 4 showed antiamnesic properties at the dose 30 mg/kg ($p < 0.01$). These two compounds were further tested for their ability to improve spatial learning and they were also effective in the Morris water maze task.
Conclusions: The results of the present study show that novel MTDLs, namely compounds 1-4, might be considered as potentially interesting lead compounds to design drug candidates for dementia.
Keywords: scopolamine-induced amnesia; novel object recognition task; passive avoidance task; Morris water maze; mice

Influence of hypotensive drugs on macrophage phagocytosis

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Introduction: A sedentary lifestyle, smoking, a high-salt and high-fat diet – all these factors are associated with the development of hypertension. More than 1 billion people aged 30-79 years have a high blood pressure; therefore hypotensive drugs are one of the most prescribed medications.
Aim of the study: Phagocytosis plays an important role in macrophage-mediated activation of humoral immune response. Our study aimed to investigate the impact of hypotensive drugs from several groups etc. beta blockers, ACE inhibitors, calcium channel blockers and angiotensin II receptor antagonists on the phagocytic function of mice macrophages.
Material and methods: In the experiment, two groups of mice were fed a standard chow and a high-salt diet, respectively. Both groups were treated intraperitoneally with hypotensive drugs (propranolol – 10 mg/kg; captopril, carvedilol, verapamil – 5 mg/kg, amlodipine – 3 mg/kg, olmesartan – 1 mg/kg) for eight days. On the third day during drug administration, we elicited peritoneal exudate by injection of mineral oil. Macrophages harvested from mice were incubated with FITC-coupled sheep red blood cells in 1:10 ratio and then cells were analyzed by flow cytometry.
Results: These results revealed that there is a statistically significant difference between untreated mice and mice treated with amlodipine, verapamil, and propranolol in a group fed standard diet, and between the untreated group and verapamil-treated mice on a high-salt diet. Propranolol and verapamil suppress phagocytic activity in mice fed with high-salt chow compared to mice on a normal diet. It is interesting to note that for amlodipine the effect is opposite.
Conclusions: Our data confirm that macrophages contribute to immunomodulatory effects of hypotensive drugs. The lowering phagocytic activity properties can be used in the treatment of inflammatory diseases associated with excessive phagocytosis, e.g., the formation of foam cells in the development of atherosclerosis.
Keywords: hypotensive drugs, high-salt diet, macrophages, phagocytosis

Fizjoterapia/Physiotherapy

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List of papers

Postępowanie rehabilitacyjne po niecałkowitym uszkodzeniu więzadła krzyżowego przedniego i artroskopii – opis przypadku

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Opiekun: dr Małgorzata Kulesa-Mrowiecka

Wprowadzenie: Jednym z najczęstszych urazów stawu kolanowego jest uszkodzenie więzadła krzyżowego przedniego (ACL). Istnieją różne protokoły postępowania w przypadku całkowitego zerwania ACL. Rzadko spotyka się prace dotyczące usprawniania pacjenta po przebytym niecałkowitym uszkodzeniu, u którego konieczna była interwencja chirurgiczna. W niniejszej pracy opisano postępowanie fizjoterapeutyczne przed i po zabiegu artroskopowego usunięcia oderwanego przednio-przyśrodkowego pęczka ACL. Interwencja ta wiązała się z koniecznością stworzenia odpowiedniego programu usprawniania dla chorej. Dodatkowym wyzwaniem okazała się stwierdzona u pacjentki hipermobilność.
Cel pracy: Ocena skuteczności zmodyfikowanego protokołu po uszkodzeniu ACL, leczonym artroskopowo. Propozycja algorytmu postępowania.
Materiały i metody: Badaniu pilotażowemu została poddana osiemnastoletnia pacjentka, od 5 roku życia uprawiająca profesjonalnie dyscypliny taneczno-ruchowe (balet). W badaniu wykorzystano autorski kwestionariusz ankiety. W celu oceny pacjenta i ewaluacji postępu terapii zastosowano: skalę VAS – Visual Analogue Scale, pomiar zakresu ruchu z wykorzystaniem aplikacji goniometr (ROM – range of motion), pomiar obwodów kończyn, testy funkcjonalne oraz testy specyficzne: szuflady przedniej, szuflady tylnej, Lachmanna, pivot-schift, Apleya, objawu balotowania rzepki, testów więzadeł pobocznych. W terapii zastosowano indywidualnie dobrane ćwiczenia, kinesiotaping, wybrane wzorce PNF – Proprioceptive Neuromuscular Facilitation oraz metody mięśniowo-powięziowego rozluźniania. Oceny stanu chorej dokonywano co tydzień. Podsumowania osiągniętych rezultatów dokonano po upływie 12 tygodni od zabiegu.
Wyniki: U pacjentki zaobserwowano: redukcję obrzęku i zmniejszenie bólu w skali VAS z 7 w pierwszym tygodniu do 2 w 12 tygodniu, pełny wyprost został osiągnięty w 1 tygodniu postępowania. Po zdjęciu opatrunku, pomiar obwodu uda w najgrubszym miejscu wynosił 54.5cm, natomiast w 12 tygodniu 57,4cm. Na koniec terapii dokonano również re-testowania z wykorzystaniem wymienionych testów specyficznych, które dały wyniki ujemne.
Wnioski: Przedstawione postępowanie przyniosło zamierzone efekty. Powyższe wyniki podkreślają fakt, iż przypadki niecałkowitych uszkodzeń ACL wymagają uwagi i odpowiednio dostosowanego postępowania (szczególnie w przypadku hipermobilności). Jest to równie ważne jak w postępowaniu np. po rekonstrukcjach. Pacjent mimo mniejszego urazu również wymaga fachowej opieki, aby w przyszłości nie doszło do całkowitego zerwania.
Słowa kluczowe: więzadło krzyżowe przednie, rehabilitacja, artroskopia, uszkodzenie więzadła, hipermobilność

Ocena poziomu aktywności fizycznej dzieci klas VII szkół podstawowych przed i w czasie trwania pandemii COVID-19

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Opiekun: dr Alicja Fąfara

Wprowadzenie: Aktywność fizyczna to bardzo waży aspekt w procesie rozwoju dzieci i młodzieży. W czasie pandemii COVID-19 szkoły przeszły na zdalny tryb pracy, wiele pozaszkolnych zajęć sportowych zostało odwołanych, a dzieci zaczęły spędzać swój czas wolny w domach. Zmniejszyło to znacząco poziom aktywności fizycznej dzieci w wieku szkolnym, co może nieść za sobą wiele negatywnych konsekwencji.
Cel pracy: Porównanie poziomu aktywności fizycznej dzieci klasy VII szkół podstawowych w okresach od 02.09.2019 do 12.03.2020 (okres działania szkół w trybie stacjonarnym w roku szkolnym 2019/2020), oraz od 13.03.2020 do 26.06.2020 (okres działania szkół w trybie zdalnym w roku szkolnym 2019/2020)
Materiały i metody: Badanie ankietowe przeprowadzone w klasach VII szkół podstawowych na terenie Małopolski. Do badania zakwalifikowano 50 uczniów z 3 losowo wybranych klas. Narzędziem badawczym był anonimowy kwestionariusz zawierający m.in. pytanie o sposób prowadzenia lekcji wychowania fizycznego, liczba godzin aktywności fizycznej na tydzień, uczęszczanie na pozaszkolne zajęcia sportowe i MVPA (Moderate-to-Vigorous Physical Activity) sposób spędzania wolnego czasu, zarówno w okresie przed pandemią COVID-19 jak i w trakcie jej trwania.
Wyniki: We wstępnych wynikach badań wykazano, że w przypadku wszystkich ankietowanych lekcje wychowania fizycznego zostały zmienione z trybu stacjonarnego na zdalny. Spowodowało to znaczący spadek aktywnego uczestnictwa dzieci w tych zajęciach. Dowiedziono również, że dostęp do pozaszkolnych zajęć sportowych, znacznie się zmniejszył w trakcie trwania pandemii COVID-19. Badania wykazały, że dzieci, które przed rozpoczęciem pandemii COVID-19 utrzymywały wysoką aktywność fizyczną (wskaźnik MVPA≥6) utrzymały ją również po rozpoczęciu pandemii. Natomiast dzieci o niższej aktywności fizycznej przed pandemią w czasie jej trwania częściowo obniżyły jej poziom.
Wnioski: Pandemia COVID-19 miała największy negatywny wpływ na aktywność fizyczną dzieci o niskim poziomie aktywności fizycznej już przed pandemią. Sugeruje to problem z poziomem motywacji tej grupy ankietowanych do aktywnego uczestnictwa w zdalnych zajęciach wychowania fizycznego i samodzielnego organizowania aktywności fizycznej. Ważnym zatem jest już od wczesnych lat życia dziecka, edukować go o benefitach płynących z odpowiedniego poziomu aktywności fizycznej. Dzięki temu nawet w utrudnionych warunkach, jakimi była pandemia COVID-19, dziecko jest w stanie utrzymać jej odpowiedni poziom i czerpać z niej przyjemność.
Słowa kluczowe: aktywność fizyczna, czas wolny, wychowanie fizyczne, pandemia Covid-19

Fizjoterapia pooperacyjna po operacji obustronnego uwolnienia przykurczy zgięciowych stawu kolanowego u dziecka a artrogrypozą – opis przypadku

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Wprowadzenie: Artrogrypoza jest zespołem objawów klinicznych, który charakteryzuje się przykurczami w co najmniej dwóch stawach. Zazwyczaj zajęte są dystalne stawy kończyn górnych i kończyn dolnych powodujące ograniczenie ruchomości. Ograniczenia ruchomości mogą dotyczyć również kręgosłupa oraz stawów skroniowo-żuchwowych. Bezpośrednią przyczyną artrogrypozy jest akinezja płodu, a ta z kolei może być wywołana wieloma czynnikami, również neurologicznymi. Przykurcz i sztywność stawów najczęściej spowodowane są niedorozwojem lub całkowitym brakiem mięśni w określonej lokalizacji oraz zaburzeniami unerwienia ruchowego mięśni. Innymi przyczynami mogą być deformacje stawów oraz defekty tkanki łącznej. Artrogrypoza jest chorobą rzadką, dlatego istnieje niewiele ośrodków doświadczonych w jej leczeniu. Wymaga kompleksowej terapii i opieki całego zespołu leczniczego.
Cel pracy: Opisanie protokołu pooperacyjnego po obustronnym uwolnieniu przykurczy zgięciowych stawu kolanowego. Przedstawienie etapów rehabilitacji u 7 letniej dziewczynki z artrogrypozą.
Materiały i metody: Materiał: 7 letnia dziewczynka z artrogrypozą (typ amyoplazja) w zakresie kończyn górnych i dolnych. Metody: Prezentacja przypadku; ocena zakresu ruchu i funkcjonowania w ADL (activities of daily living); ocena siły mięśniowej.
Wyniki: Aktualnie pionizuje się w wysokich ortezach. Rozpoczęła też pionizację w krótkich ortezach – postęp powolny. W ROM ocena zakresu zgięcia w prawym stawie kolanowym do 90° a w lewym do 80°. Zwiększenie siły mięśniowej (w skali Lovetta) z 2 na 3 – obustronnie. Funkcja: próbuje się pionizować bez ortez wysokich.
Wnioski: Fizjoterapia po operacji przykurczy zgięciowych jest niezbędnym etapem kompleksowego leczenia; w trakcie postepowania pooperacyjnego konieczne jest stosowanie indywidulanego zaopatrzenia ortotycznego.
Słowa kluczowe: artrogrypoza, fizjoterapia pooperacyjna, rehabilitacja, ocena zakresu ruchu, ortotyka, przykurcze

Badanie różnic w aktywności mięśni kończyny górnej, podczas wykonywania pompek, w zależności od przyjętego kąta rozwarcia pomiędzy ramionami a klatką piersiową

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Wprowadzenie: Dzięki postępowi naukowemu w ostatnich latach trening siłowy ulega gwałtownym przemianom. Coraz liczniejsze badania naukowe umożliwiają dokładniejsze określenie, jakie typy ćwiczeń nadają się najlepiej w tego typu aktywności. Poszukiwanie najbardziej optymalnych form prowadzi do tworzenia nowych rodzajów ćwiczeń, jednakże renesansowi ulegają również starsze, uznawane za klasyczne aktywności – takie jak „pompki". Dzięki złożoności ruchu jaki odbywa się w czasie wykonania „pompki" angażowanych jest wiele grup mięśniowych, co stwarza możliwości kompleksowego treningu kilku partii mięśniowych jednocześnie. Istnieje wiele modyfikacji tego ćwiczenia, w każdej z nich mięśnie biorące udział w ruchu wykonują swoją pracę z różnym stopniem aktywności, co wpływa na stopień hipertrofii osiągany przez każdy z nich i ma istotny wpływ na przyrost masy mięśniowej. Poznanie stopnia aktywacji mięśni w poszczególnych wariantach „pompki" daje szanse lepszego dostosowania konkretnego wariantu do możliwości i celu jaki ćwiczący chce osiągnąć w treningu siłowym.
Cel pracy: Sprawdzenie, czy technika wykonywania pompki wpływa na zaangażowanie poszczególnych/badanych mięśni (mięsień piersiowy większy, mięsień trójgłowy ramienia).
Materiały i metody: Mężczyźni między 18 a 26 rokiem życia wykonujący trening siłowy, który obejmuje wykonywanie pompek klasycznych. Sprawdzanie aktywności poszczególnych mięśni podczas wykonywania pompek w różnych ustawieniach przez osoby badane za pomocą sEMG z wykorzystaniem urządzenia ULTIUM. Zapis wyników, ich zestawienie i analiza.
Wyniki: Stwierdzono, że ustawienie kończyn górnych w trakcie wykonywania pompek wpływa na efektywność pracy mięśnia piersiowego większego i trójgłowego ramienia.
Wnioski:
a) Im szersze rozstawienie ramion tym bardziej zaangażowane są mięśnie piersiowe większe.
b) Im węższe rozstawienie ramion tym bardziej zaangażowane są mięśnie trójgłowe ramion.
Słowa kluczowe: pompka, ćwiczenie, mięsień piersiowy większy, mięsień trójgłowy ramienia, sEMG, rozstawienie ramion

Wpływ tapingu tonizującego na aktywność bioelektryczną mięśni w zależności od czasu aplikacji

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Wprowadzenie: Osłabienie czynności bioelektrycznej mięśni szkieletowych stanowi często problem kliniczny. Może ono być zwiastunem chorób ogólnoustrojowych albo towarzyszyć przeciążeniom mięśni. Problem ten może dotyczyć pojedynczych mięśni lub całych grup. Zmniejszenie aktywności bioelektrycznej mięśni może często utrudniać codzienne funkcjonowanie, uniemożliwiać odbywanie prawidłowego treningu, czy prowadzić do zaburzeń statyki ciała. Według obecnej wiedzy wydaje się, że w fizjoterapii osób z obniżoną aktywnością bioelektryczną mięśni pomocną metodą jest taping tonizujący.
Cel pracy: Celem pracy jest sprawdzenie, czy czas utrzymywania aplikacji tonizującej na danych mięśniach szkieletowych ma wpływ na aktywność bioelektryczną tych mięśni.
Materiały I metody: Badaniami objęto 15 osób w wieku od 18 do 35 lat. Odbywały się w Instytucie Fizjoterapii UJ CM od listopada 2021 r. do marca 2022 r. Nabór do grupy odbywał się losowo. Badanie podzielone zostało na pięć części (A-E). Część A obejmowała wywiad mający na celu wykluczyć z badania osoby posiadające choroby zaburzające aktywność mięśni oraz takie, które w ostatnim czasie przeszły uraz kończyn dolnych, co mogłoby wpłynąć na wynik. Część B zawierała badanie EMG mięśnia prostego uda, mięśnia obszernego bocznego oraz głowy bocznej i przyśrodkowej mięśnia brzuchatego łydki podczas dwóch aktywności – napięcia izometrycznego i wchodzenia na step w ustalonym rytmie bez wcześniejszego zastosowania tapingu tonizującego. Część C zawierała analogiczne badanie EMG po 30 minutach od zastosowania tapingu tonizującego na powyższe mięśnie. Część D i E zostały przeprowadzone w taki sam sposób jak część C, ale czas od aplikacji tonizującej wynosił odpowiednio 12 godzin i 20 godzin. Wszystkie badania zostały wykonane z użyciem urządzenia pomiarowego Ultium. Wyniki zestawiono i poddano analizie.
Wyniki: Badania wstępne wykazały poprawę aktywności bioelektrycznej mięśni po 12 i 20 godzinach po zastosowaniu tapingu tonizującego. Nie zauważono takiego efektu po 30 minutach.
Wnioski: Efekty zastosowania tapingu tonizującego na mięśnie szkieletowe są różne w zależności od czasu. Temat pracy wymaga dokładniejszych badań.
Słowa kluczowe: taping tonizujący, aktywność bioelektryczna, mięśnie szkieletowe

Ból odcinka szyjnego kręgosłupa w związku z zespołem stresowym u pacjentów po przejściu zakażenia SARS-CoV-2

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Wstęp: Zaangażowanie dodatkowych mięśni wdechowych podczas chorób układu oddechowego, jak również zakażeń SARS-CoV-2 wydają się być związane również silnym czynnikiem stresowym. Mięśnie wdechowe powiązane są bezpośrednio z odcinkiem szyjnym i piersiowym kręgosłupa, a więc ich praca może wpływać na dysfunkcje w ich obrębie. Analizując piśmiennictwo dotyczące bólów kręgosłupa na tle stresowym nie odnaleziono prac dotyczących wpływu zakażenia wirusem SARS-CoV-2 na bóle kręgosłupa.
Cel pracy: Ocena występowania bólu w odcinku szyjnym kręgosłupa u pacjentów po przebyciu zakażenia wirusem SARS-CoV-2.
Materiały i metody: Przeanalizowano 83 ankiety (20 nie zostało uwzględnionych ze względu na obecność czynników wykluczających), w których wzięło udział 37 mężczyzn oraz 46 kobiet wieku od 20 do 60 roku życia.
Kwestionariusz ankiety własnej składał się z 25 pytań uwzględniających m.in. obecność zwyrodnienia odcinka szyjnego kręgosłupa, doświadczenie sytuacji stresowych w ciągu ostatniego roku, nasilenie bólu w odcinku szyjnym podczas określonych ruchów, promieniowanie bólu, skalę Visual Analogue Scale (VAS) oraz obecność objawów tzw. Mgły pocovidowej.
Wyniki: Na podstawie analizy ankiet zaobserwowano, że ból odcinka szyjnego kręgosłupa występuje u 66 osób (79,52%) w tym u 23 osób (34,85%) ból nie występował przed zakażeniem SARS-CoV-2.
Głównym miejscem bólu, bo aż u 54,22% ankietowanych jest odcinek szyjny od poziomu C3 do C7, (pytanie to zawierało rycinę, na której zaznaczyliśmy poszczególne obszary okolicy odcinka szyjnego) natomiast długotrwałe siedzenie jest według 49,4% ankietowanych głównym czynnikiem wywołującym wyżej opisany ból.
U większości badanych zaobserwowano brak promieniowania bólu (75,9%), a jako główną jego przyczynę wskazywano bezruch (61,45%).
Wnioski: Zakażenie wirusem SARS CoV-2 wiąże się z występowaniem bólu odcinka szyjnego kręgosłupa. Dodatkowo zaangażowanie dodatkowych mięśni wdechowych w trakcie choroby przekłada się na dysfunkcje w obrębie odcinka szyjnego i piersiowego oraz bóle głowy.
Słowa kluczowe: SARS CoV-2, ból, kręgosłup szyjny, stres

Współpraca chirurga szczękowo-twarzowego i fizjoteraptuery kluczem do sukcesu założenia przyklinicznego zespołu rehabilitacyjnego

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Wstęp: Domeną współczesnej chirurgii szczękowo-twarzowej jest odtwarzanie utraconych tkanek i przywrócenie funkcji. Twarzowa część czaszki, będąca wizytówką ciała ludzkiego, ma złożoną budowę anatomiczną. Zaburzenie jej czynności lub harmonijnego układu, w wyniku urazu lub operacji onkologicznej, prowadzi do kalectwa czynnościowego i estetycznego. Poprawy estetyki twarzy i warunków zgryzowych oczekują również pacjenci z wadami ortognatycznymi.
Zadowalający efekt terapeutyczny można osiągnąć tylko poprzez wielospecjalistyczne leczenie przebiegające etapowo, na które składają się diagnostyka, leczenie chirurgiczne i odtwórcze oraz wspomagające, czyli fizjoterapia z elementami fizykoterapii.
Ze względu na złożoność procesu terapeutycznego utworzono Przykliniczny Zespół Rehabilitacyjny przy Katedrze i Klinice Chirurgii Czaszkowo-Szczękowo-Twarzowej. Wielospecjalistyczny Zespół to lekarze, fizjoterapeuci oraz studentów powyższych kierunków. W zależności od indywidualnych potrzeb pacjentów współpracę rozszerza się o dietetyka, logopedę oraz psychologa.
Rozwinięcie: Nadrzędnym celem zespołowej terapii jest podnoszenie sprawności oraz jakości życia pacjentów poprzez redukcję dysfunkcji wynikających z przebytej choroby i leczenia. Algorytmy leczenia oparte są na metodach fizjoterapeutycznych zweryfikowanych naukowo z uwzględnieniem indywidualnych potrzeb pacjenta.
Kwalifikacja do rehabilitacji prowadzona jest przez lekarzy, a podczas pierwszej wizyty konsultacyjnej w Zespole Rehabilitacyjnym oceniane są potrzeby lecznicze i wyznaczany cel terapii. Proces rehabilitacji najczęściej obejmuje 10 sesji fizjoterapeutycznych w odstępach tygodniowych, podczas których stosowane są między innymi: drenaż limfatyczny, terapia blizn, kinesiotaping, mobilizacja stawów skroniowo-żuchwowych oraz terapia oddechowa. Pomiędzy kolejnymi wizytami pacjent jest zobowiązany do prowadzenia codziennej autoterapii według podanych zaleceń.
Dzięki zespołowej terapii w licznych przypadkach osiągnięto pełny powrót funkcji nerwu twarzowego, prawidłowy zakres odwodzenia żuchwy, eliminację dolegliwości bólowych, a przez to poprawę komfortu psychicznego pacjentów oraz ich powrót do życia społecznego.
Zakończenie: Przedstawione działania Zespołu Rehabilitacyjnego nie są standardowym postępowaniem w opiece pooperacyjnej w zakresie chirurgii szczękowo- twarzowej. Na podstawie 5-letniego doświadczenia klinicznego można jednoznacznie stwierdzić, że taka opieka jest nieodłącznym elementem uzupełniającym leczenie chirurgiczne.
Słowa kluczowe: interdyscyplinarność, fizjoterapia, chirurgia szczękowo- twarzowa

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PUBLIC HEALTH

Rural patients' awareness of myocardial infarction risk factors and symptoms

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Trustee: Tomasz Korman, MD

Introduction: Mortality from myocardial infarction (MI) may be reduced by early prevention and effective treatment. Both factors are patient dependent since it is the patient who has the greatest impact on risk factors control and is the one who must recognise first symptoms of occurring MI.
Aim of the study: To investigate rural patients' awareness of MI risk factors and symptoms.
Material and methods: An anonymous and voluntary survey was conducted among 194 patients and their caregivers with median age 68 years at a rural healthcare facility in Poland. The response rate was 91%.
Results: 78% of participants with three or four risk factors believe not to be at risk of MI. All risk factors were recognized by 26.3%. 90.2% indicated smoking as a risk factor, 89.6% overweight and obesity, 85% hypertension, 83.4% lack of physical activity, and 80.3% history of heart disease. Diabetes, history of MI in family and hypercholesterolemia were recognised by 67.4%, 54.9%, and 52.8%, respectively. 22.7% of respondents recognized all suggested MI symptoms. Chest pain with nausea and isolated chest pain lasting over 20 minutes were indicated by 74.1% and 73.1%, respectively. Shortness of breath with sweating was identified by 54.4% of patients and epigastric pain with shortness of breath by 35.8%. Better awareness of risk factors and symptoms was associated with the declaration of being at risk of MI. (Risk factors: (yes: 8/9 [7.75, 9.00], no: 8/9 [5.25, 8.00], I do not know: 7/9 [5.00, 8.00], p <0.001); Symptoms: (yes: 85.7%, no: 78.4%, I do not know: 67.8%, p = .045)).
Conclusions: Patients' awareness of risk factors and less common symptoms should be improved. The patients who believe to be at risk of MI have a better knowledge on the subject.
Keywords: myocardial infarction, rural, risk factors, management, symptoms

Are rural patients aware of myocardial infarction management? A survey study in the COVID-19 era

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Introduction: Patients' ability to call an ambulance in case of myocardial infarction (MI) occurrence is a key factor in the chain of survival.
Aim of the study: To investigate rural patients' awareness of MI management during the COVID-19 pandemic.
Material and methods: An anonymous and voluntary survey was conducted among 194 patients and their caregivers with median age 68 years at a rural healthcare facility in Poland. The response rate was 91%.
Results: 91.8% of participants believe MI to be a condition requiring immediate medical action. 76.2% of respondents would call an ambulance in case of chest pain suggesting MI in themselves. 4.7% would go to hospital on their own. 9.8% would go to the outpatient clinic, and 2.6% would arrange a teleconsultation with a general practitioner. 4% would make an appointment with a cardiologist. 0.5% would wait until the symptoms subside and 2.1% did not know what they would do. Among those who would not call an ambulance nor present to hospital 38.7% declared to be afraid of hospital-acquired COVID-19 infection or improper medical care due to the ongoing pandemic. Patients declaring themselves at risk of MI were more prone to call an ambulance in case of MI symptoms in themselves (yes: 85.7%, no: 78.4%, I don't know: 67.8%, p = .045). 76.3% of participants could provide a correct emergency call number. 64.4% realise that MI may lead to disability.
Conclusions: Even though a relatively high percentage of patients are aware that MI requires immediate medical action, there is a significant amount of them that would not call an ambulance, delaying proper help. The COVID-19 pandemic has exacerbated the problem.
Keywords: myocardial infarction, COVID-19, management, ambulance

Evaluation of the ability to assess the radiological anatomy of the craniofacial structures among students of Dentistry

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Introduction: Panoramic radiography is a routine imaging method in dental practice as well as an important diagnostic tool in dentistry. In the OPG photo, apart from the condition of the teeth and surrounding tissues, the condition of the temporomandibular joints can also be assessed, which is particularly important in the diagnosis of dysfunction of these joints. However, panoramic images are extraordinarily challenging to interpret due to many difficulties. Graduates of dental studies should be aware of image distortions caused by various factors and be able to distinguish them from normal structures in order to make a accurate diagnosis.
Aim of the study: Determine whether there is a correlation between the year of study and the knowledge of craniofacial radiology

Material and methods: The study was carried out at the turn of March and April 2021 on 131 Polish, dentistry students of Jagiellonian University Medical College, using the Microsoft Teams program. Each participant had to determine the location of 4 anthropometric points on 4 orthopathomographic images. The authors of the study determined the lines from the points and then calculated the angle between them. The research was approved by the Bioethics Committee of Jagiellonian University. The obtained results were summarized in the table and statistically analyzed using the R program, version 4.1.2.
Results: The results of people from particular years did not differ statistically significantly.
Conclusions: In the first three years of study, students have this same skills in the field of craniofacial radiology.
Keywords: Orthopantomogram, Dental radiology, Articular angle, Panoramic technique errors

SURGICAL CASE REPORT

Surgical treatment of suprasystemic pulmonary hypertension with revers Potts shunt and perventricular implementation of Melody valve – case report

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Trustee: Tomasz Mroczek, Associate Professor, MD, PhD

Introduction: Children with suprasystemic pulmonary hypertension (SPH) are at high risk of right-sided heart failure and, as a consequence, sudden death. Apart from pharmacological therapy, there is an option of surgical treatment of SPH using a Potts shunt, which consists in creating an anastomosis between the aorta and the pulmonary artery. However, its beneficial hemodynamic effect may be cancelled by pulmonary valvular insufficiency.
Results: A 4,5-year-old girl was admitted to the cardiology department due to deterioration of exercise tolerance and insufficient body weight. The patient had a history of oesophageal atresia and tracheoesophageal fistula, corrected operationally on the second day of life. The girl in the third month of life underwent a cardiac procedure aimed at correcting truncus arteriosus communis. During current hospitalization echocardiography and cardiac catheterization were performed and revealed widening of the previously implanted graft, features of right ventricular dysfunction, inefficient pulmonary valve function, and SPH. Intensive pharmacotherapy was implemented. Because of an absence of the expected pharmacotherapy effect a reverse Potts shunt was surgically created. Due to the patient's hemodynamic conditions, endovascular replacement of the pulmonary valve was impossible. Perventricular implantation of the Melody valve was performed through the limited lower sternotomy, under mild hypothermia. The echocardiographic examination followed the operation and confirmed the functionality of the Melody valve. After 5 weeks of recovery, the patient was discharged home with bosentan and sildenafil therapy with no need for oxygen therapy. Two years after surgery, an increase in body weight, improvement in quality of life, and reverse remodelling in the right ventricle were noted. The Melody valve was fully competent.
Conclusions: Melody valve may be implemented using the perventricle approach. Potts shunt improves the prognosis of patients with SPH. Treatment of pulmonary valve insufficiency is pivotal to the prognosis of patients with Potts shunt.
Keywords: pulmonary hypertension, reverse Potts shunt, Melody valve

CASE REPORT INTERNAL MEDICINE

A rare case of arterial thrombosis in a young woman with a ten-year follow-up

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Introduction: Arterial thrombosis is a severe vascular complication and a common cause of acute ischemia. It rarely occurs in healthy young people and usually is associated with hypercoagulability. We present a rare case of arterial thrombosis in two locations in a young woman without hypercoagulation with a ten-year follow-up.
Results: A 21-year-old previously healthy woman was admitted with a sudden, acute pain and movement impairment in the right leg. She had been taking synthetic estrogen preparation for a year. An ultrasound revealed thrombosis of the right common iliac artery. She was diagnosed with an acute leg ischemia, and targeted thrombolysis with unfractionated heparin was effectively applied. After this procedure, the thrombosis recurred; therefore, surgical embolectomy was performed. The signs of the ischemia resolved. The administration of low molecular weight heparin and acetylsalicylic acid was continued. A venous ultrasound revealed no abnormalities. One month later, the patient presented with visual disturbance and a persistent headache. Diagnostic imaging showed an ischemic area in the right hemisphere, no blood flow on the C4 intracranial level of the internal jugular artery, and impaired blood flow in the middle cerebral artery. After the anticoagulation and antiplatelet therapy, the symptoms subsided without any neurological impairment. The genetic and immunological tests revealed no hypercoagulability. The test of fibrin properties showed that its structure and function were compromised. It increased the risk of rapidly-forming compact and lysis-resistant clots. Chronic anticoagulant and antiplatelet therapy was instituted and retained for a decade, preventing thromboembolic events (in the meantime she gave birth to a healthy child). The test was repeated after the decade, demonstrating improvement: fibrin's permeability had increased and the clot lysis time shortened.

Conclusions: Transient, unfavorable features of fibrin's structure may increase the risk of various thrombotic complications in arterial vessels, possibly necessitating chronic anticoagulant therapy.
Keywords: arterial thrombosis, fibrin properties, anticoagulant therapy

SARS – COV 2 infection in hematological malignancies

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Introduction: The new coronavirus pandemic has caused significant morbidity and mortality worldwide. Elderly patients, immunocompromised patients and patients with comorbidities belong to risk groups for an unfavorable prognosis of the disease. A concern exists regarding the vulnerability of patients who have been treated with immunosuppressive drugs prior or during this pandemic since they may also have decreased detrimental inflammatory responses. Patients with haematological malignancies have worse outcomes than the general population as their clinical course can be altered by their immunosuppressed state.
Results: A 81 – years old, male patient was hospitalized in Clinic of Infectious Disease "Sf Parascheva" Iasi with confirmed SARS – COV 2 infection. Physical examination revealed a "silent" hypoxia, without significant respiratory distress, but low oxygen saturation (80% on room air). The patient had a significant medical history with tuberculosis (possible without antituberculous treatment) and Waldenström macroglobulinemia with secondary dysimmune syndrome treated 6 years ago with immunosupressants and biological therapy. Treatment with antivirals (lopinavir/ritonavir), corticosteroids, anticoagulants and antibiotherapy was initiated. Severity of COVID pneumonia was confirmed by X – ray. Patient also presented an acute diarrheal syndrome possible related to antivirals since toxins for Clostridium difficile test was negative. Because of negative prognosis factors, treatment was shifted to Tocilizumab, 5 day administration of Remdesivir and broad – spectrum antibiotics. Evolution was slowly favorable and the patient was discharged with recovery of the respiratory function after 18 days of hospitalization.
Conclusions: : Our findings suggest that even in cases of an immunosuppressed patient with hematological malignancy and SARS – COV 2 infection, the appropriate clinical management together with respiratory therapy contributes to patient's survival.The increase of IL-6 within the "cytokine storm" within COVID-19 infection may be a risk factor for Waldenström disease, but the dministration of Tocilizumab (IL-6 receptor antagonist) exerted beneficial effects.
Keywords: immunology, inflamation, COVID-19, Waldenström's macroglobulinemia

Multiple long-term cardiovascular complications after combined oncological treatment of Hodgkin's lymphoma: a case report

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Introduction: In contemporary society, the number of patients following successful oncological treatment is increasing Nevertheless, that treatment's complications are an inseparable problem of these patients. In the current report, we present the history of a woman who underwent neoplasm treatment with cardiovascular complications.
Results: A 64-years old female with retrosternal pain in II class of CCS was admitted to the reference cardiovascular center to perform coronarography. In 1992 patient was diagnosed with Hodgkin lymphoma (HL) treated with head and chest radiotherapy (the total dose 39 Gy). In 1998, patient experienced a local relapse of tumor. Then, successful COPP/ABV chemotherapy was administered. Performed ultrasound Doppler pointed significant stenosis of the left subclavian (LSA) and left vertebral artery (LVA) with disturbed blood flow and the III stage of subclavian steal syndrome (SSS). Furthermore, the SPECT examination showed perfusion defects including apical and septal segments (11% of the myocardium). The echocardiography revealed moderate incompetence of tricuspid valve with small insufficiency of aortic one. Furthermore, the aortic valve was massively calcified. The analysis of coronarography documented two-vessel coronary artery disease (CAD) with the significant stenosis of left main, critical stenosis of left artery descending, and 80% stenosis of the right coronary artery. Patient was consulted during the Heart Team and the decision about percutaneous revascularization (PCI) was made. The successful PCI with implantation of the stent has been accomplished.
Conclusions: We suggest that the observed vascular changes along with the presence of vascularized mass resulting with SSS and CAD developed from the radiation-induced injuries in the course of HL treatment. Modern radiotherapy in HL is more precise and focused on pathological lesions. However, there is a vast number of patients treated with traditional methods using higher doses and with worse protection of the thorax area that are at serious risk of developing complications. In patients with a high risk of developing side effects, periodic examinations could lead to earlier diagnosis.
Keywords: Hodgkin lymphoma, radiotherpay, cardiovascular complications, subclavian steal syndrome,CAD

Sudden cardiac death risk stratification in a patient with early repolarization pattern and family history of Brugada syndrome: a case report

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Trustee: Paweł T. Matusik, MD, PhD

Introduction: Early repolarization pattern (ERP) consists of characteristic features regarding QRS complex and J-point. It can be diagnosed adventitiously in a 12-lead electrocardiogram (ECG) or Holter ECG monitoring, especially when pronounced ERP changes appear at night. ERP is considered a risk factor for major arrhythmic events in certain individuals, including patients with Brugada syndrome (BrS). The key point when dealing with patients with ERP is to stratify the risk of sudden cardiac death, including ERP features, and thereby to assess the requirement of implantable cardioverter-defibrillator (ICD) placement.
Results: A 24-year-old male was admitted to the hospital with the suspicion of BrS. Patient reported a single episode of presyncope which occurred during bathing in a warm water. He denied any syncopal episodes and did not experience a sudden cardiac arrest. His family history indicated two sudden cardiac deaths: in patient's father, who was diagnosed with BrS, and in patient's grandmother. There were no structural abnormalities in the echocardiography study and performed ajmaline challenge did not reveal typical for BrS ECG changes. Both, exercise test and repeated Holter ECG monitorings did not reveal any sustained ventricular arrhythmia. However, in 12-lead Holter ECG monitoring ERP in inferior and lateral leads was observed. Genetic study of sodium voltage-gated channel alpha subunit 5 gene (SCN5A) did not reveal abnormalities associated with BrS.
Conclusions: The patient remains under further diagnostics and close follow-up in the ambulatory clinic. ERP has a wide range of ECG features, which may determine potential malignancy. It is crucial to properly stratify the risk of major arrhythmic events both in symptomatic and asymptomatic patients with ERP to provide optimal clinical care.
Keywords: early repolarization pattern, J-point elevation, risk stratification, sudden cardiac death

Treatment-resistant paraganglioma of the retroperitoneal space

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Trustee: Agnieszka Żyłka, MD, PhD

Introduction: Paraganglioma is a rare neuroendocrine tumor with the ability to secrete neuropeptides and catecholamines. The most common clinical presentation is hypertension and sympathetic nervous system overactivity.
Results: A 73-year-old male patient was admitted due to the detection of a tumor in the retroperitoneal space on ultrasound (US) examination on 04.2019. He complained of long-term constipation and suprapubic back pain without weight loss. His past medical history: well-controlled hypertension, type 2 diabetes mellitus, paroxysmal atrial fibrillation and hyperlipidemia. His medication, family history were unremarkable. Physical examination revealed a soft abdomen without palpable masses. Computed tomography (CT) of the abdomen revealed an 8x6x8cm solid heterogeneous tumor in the retroperitoneal space invading aortocaval space. The tumor adhered closely to the vessels, local nodes were not enlarged. High scores of methoxy derivatives of catecholamines were found in plasma (normetanephrine-7099pg/ml; the norm-<200pg/ml) and urine. Histopathological examination confirmed paraganglioma. Radiological studies have shown the tumor is inoperable. Genetic testing revealed no relevant mutation. Whole-body scintigraphy and SPECT at 24, 48 and 72 hours reveal areas of high I-131MIBG-uptake in the tumor. On 11.2019 the patient was started on I-131MIBG treatment, after pharmacological preparation with doxazosin. He received 4 doses every 5 months. The follow-up US and scintigraphy after each treatment revealed that the tumor size remained unchanged, no metastases were found. In 05.2021 intensity-modulated radiation therapy (IMRT) was introduced for 6 weeks with a total dose of 4860cGy/T. A PET scan performed after this treatment showed no change in tumor mass. The patient is currently under observation and waiting for a follow-up CT scan. Oncologists plan to introduce chemotherapy in case of unsuccessful treatment.
Conclusions: Although this patient was symptomatic with scintigraphy I-MIBG-uptake, the tumor was resistant to treatment. This prompts the search for new therapeutic pathways and multidisciplinary approaches between an experienced endocrinologist, radiologist, genetics, pathologist, oncologist.
Keywords: inoperable paraganglioma

Coexisting CLL and MGUS: a case report

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Trustee: Prof. Wiesław W. Jędrzejczak, MD, PhD

Introduction: Chronic lymphocytic leukemia (CLL) is the most common leukemia in adults. Monoclonal gammopathy of unknown significance (MGUS) is an unsymptomatic condition characterized by presence of an abnormal monoclonal protein in the blood. It can transform into multiple myeloma (MM). The current treatment approach to MGUS is observation. CLL very rarely coexists with plasmocytic dyscrasias, and few reports on such cases exist.
Results: A 58 year old male presented with leukocytosis (20,9 G/L) and lymphadenopathy. He was in good general health (ECOG: 1) and any comorbidities, but reported an allergy to

trimetroprim+sulfametoksazole. A lymph node biopsy was taken at presentation and revealed a diagnosis of CLL of Rai I and Binet B stage. A month later, routine tests showed co-existing monoclonal IgA and IgM proteins and kappa light chains, serving as a basis for a diagnosis of a concurrent MGUS. 8 months after diagnosis of CLL, the patients' WBC count began to rise and reached 200 G/L with lymphocytes 180 G/L. CT scans revealed enlarged lymph nodes in the mediastinum, axillary fossa, paraaortal region, near the visceral trunk and surrounding the iliac vessels and splenomegaly. Because of the advancement of CLL, the patient began R-FC chemotherapy (rituximab+fludarabine+cyclophosphamide). After four cycles of chemotherapy, CT scans showed a decrease of nodal masses and spleen of around 40%. The patient received two more cycles of R-FC and achieved partial remission (PR) of CLL. Currently, 44 months after diagnosis of CLL, after 6 cycles of R-FC, the patient is still in partial remission of CLL and has correct blood counts.

Conclusions: Because MGUS is a benign hematologic disorder, our patient was only treated for CLL and successfully achieved PR. This case serves shows that although uncommon, CLL can coexist with plasmacytic disorders. In such situations, the choice of treatment depends on the type of coexisting plasmacytic dyscrasia.

Keywords: Hematology, Chronic lymphocytic leukemia, chemotherapy, MGUS, Plasma cell dyscrasias

Acute heart failure due to acute myocarditis

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Introduction: Acute myocarditis is a rare condition, which is defined as the inflammation of cardiac muscle tissue. The etiology is most commonly viral, although it can also be caused by other pathogens or exposition to certain medications, chemicals or autoimmune diseases. The most common complications are: heart failure, arrhythmias, cardiac arrest and thrombi formation.

Results: A 33 year old man has been transferred from a regional hospital due to the exacerbation of acute de novo heart failure. Troponin and NT-pro-BNP levels were elevated greatly so the patient was urgently transferred for a coronary arteriogram, which did not show significant narrowings in the coronary arteries. The following echocardiography revealed severe impairment of systolic and diastolic function (LVEF 12.5%), as well as enlargement of the ventricles and the atriums. 24 hour electrocardiography has shown numerous ventricular stimulations and one episode of ventricular tachycardia. Due to these findings, the patient underwent a heart MRI which indicated acute myocarditis complicated with a left ventricular thrombus. The patient was treated with sacubitril/valsartan, torasemide, amiodarone, dabigatran and allopurinol which resulted in significant improvement. After stabilization of the patient's state, 8 days from the admission, he was discharged with the recommendation to maintain pharmacotherapy and included in an observational group for periodical MRI, echocardiography and 24 hour electrocardiography control.

Conclusions: Acute myocarditis can be mistaken with other, more common diseases that cause acute heart failure. Upon admission, it is important to exclude acute coronary syndromes, as the biochemy results in both conditions are similar. Then proceed with the diagnostic to begin a proper treatment, as the state of the patient and the subsequent complications can be very severe. Diagnostic and treatment of acute myocarditis require special equipment and knowledge, so a suspected patient should be transferred to a tertiary hospital.

Keywords: acute myocarditis, acute heart failure, MRI

Acute liver failure in the course of Wilson's disease

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Introduction: Wilson's disease is an inherited disease caused by the mutation of ATP7B gene, which codes transmembrane ATP-ase transporting copper. The mutation leads to the accumulation of copper in the soft tissues. Most often it is stored in the liver and brain. The clinical course may differ among patients, however, progressive liver disease is one of the most common manifestations. Fast diagnosis and proper treatment may increase the patient's survival rate.

Results: A 21-year-old woman without any previous medical history was admitted to the Intensive Care Unit (ICU) of the University Hospital. The reason for the admission was acute liver failure. At the admission the patient was conscious, GCS 15, she needed supplemental oxygen therapy. Laboratory tests showed increased bilirubin level 46mg% and high INR. On the first day, renal replacement therapy and plasmapheresis were started and continued till the discharge of the patient. Within the first days, the bilirubin level was decreased by half. The patient presented ascites, which needed peritoneal drainage. The patient had disturbed consciousness and digestive tract disorders that disappeared during hospitalization. The circulatory system was supported with catecholamines. The patient was put on the waiting list for a liver transplant. Until transplantation patient had aggregately 25 plasmapheresis cycles and a single SPAD treatment, which led to reduction of bilirubin level from 40 mg/dl to 10 mg/dl. After 36 days in the ICU, the patient was transferred to another hospital, where she awaited the transplant.

Conclusions: This case suggests that undiagnosed and untreated Wilson's disease can be fatal to the patient. However, certain patients will require a liver transplant despite the treatment.

Keywords: Wilson's disease acute liver failure

A case report of locally advanced TNBC showing a response to a paclitaxel treatment following AC-based neoadjuvant chemotherapy

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Introduction: This case report presents a young patient, carrying a rare BRCA1 mutation, treated with neoadjuvant chemotherapy as a standard of care for locally advanced triple negative breast cancer. Curative surgery and adjuvant chemotherapy: capecitabine was applied to the patient.
Results: A 27-year-old woman was referred to our hospital in February 2021 due to an axillary mass found during a visit to the gynecologist and was diagnosed with right locally advanced (T2N1M0, stage IIB) triple negative breast cancer. After four courses of AC and twelve courses of paclitaxel as NAC, the following medical imaging was performed: Ultrasound: a hypoechoic solid lesion of a size of 16 x 9 mm was found in the upper outer quadrant of the right breast, dim. 16 x 9 mm – versus 20x16mm before surgery; no other focal length changes were found. There were no solid changes, such as cysts, in the left breast. Axillary cavities did not present signs of lymphadenopathy. Magnetic resonance imaging (MRI) showed a right breast mass of 13 mm diameter. **Conclusions:** BIRADS 6. Right breast cancer during chemotherapy showed visible response to treatment. Histopathological examination of core needle biopsy of the tumor revealed invasive No Special Type (NST) carcinoma. No more findings of distant metastases were recognized. Patient underwent a right breast mastectomy with axillary lymph node dissection without major complications. As an adjuvant therapy, daily capecitabine treatment was initiated and significant shrinkage was immediately obtained. Patient is on capecitabine treatment from December 2021. Patient has a family history of breast and ovarian cancer. She also carries a BRCA1 mutation.
Conclusions: Mutations of the BRCA1 gene were revealed in the patient, her mother and aunt. In this case report, the combination of NAC, surgery and adjuvant chemotherapy showed significant tumor shrinkage of TNBC showing disease regression. Further observation of changes is recommended to the patient. The patient remains on capecitabine treatment from December 2021.
Keywords: BRCA mutation, Triple negative breast cancer

Unusual presentation of lung cancer in a 67-year-old female

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Introduction: Paraneoplastic syndromes (PNS) are present in about 8% of patients with neoplasms. Their signs and symptoms may precede the classical manifestation of tumours and this fact allows early diagnosis vital for the introduction of treatment. Small cell lung cancer (SCLC) comprises about 15% of all cases of lung cancer and can manifest with three of PNS: syndrome of inappropriate antidiuretic hormone hypersecretion (SIADH), ectopic ACTH syndrome (EAS), and Lambert-Eaton myasthenic syndrome (LEMS).
Case report: A 67-year-old woman was admitted to the emergency department due to a pre-syncope symptoms. Physical examination revealed striae on the abdominal wall and diminished breathing sounds parabasal on the left side. One year earlier, a round lesion on the chest radiograph was found, the patient started to have recurrent bronchitis and episodes of hyponatraemia and hypokalaemia. After admission to the hospital, on radiological imaging, the disseminated lung neoplasm was found and the biopsy confirmed diagnosis of SCLC. Laboratory examinations revealed progressive hyponatraemia and hypokalaemia. Plasma osmolality was reduced which allowed diagnosis of SIADH. The further evaluation also showed an increase in ACTH and cortisol concentrations, with no response in the 2 mg dexamethasone suppression test, which was the basis of the diagnosis of EAS. The patient was treated with restriction of fluid intake, sodium and potassium supplementation and fludrocortisone. Systemic chemotherapy has also been started.
Conclusion: SIADH is found in about 10% of SCLC cases, while EAS is only found in about 2%. The co-occurrence of both paraneoplastic syndromes is extremely rare- previously only 8 similar cases were reported in the literature. Due to their pathogenesis, the symptoms of SIADH and EAS can counter each other, which makes them difficult to diagnose. In the differential diagnosis of unusual signs and symptoms, neoplasms should always be included.
Keywords: lung cancer, paraneoplastic syndromes, SIADH, EAS

Otitis media as the cause of dangerous intracranial complications

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Background: Chronic otitis media with cholesteatoma is a serious type of chronic otitis media. It may present with various complications, ranging from mild to severe. Especially threatening for the patient are intracranial complications, including brain abscess. It is a rare condition, requiring specialized surgical intervention and a multispecialized approach.

Case report: A 64-year-old patient was admitted to the hospital with a diagnosis of otitis media. Before admission he lost his conscience in the bathroom, had an epileptic attack and there was no contact with him. Computer Tomography (CT) revealed a state after a left craniotomy with a possible perforation to the middle fossa of the cranium. A growth in left temporal lobe was detected, which had a loss of densivity and so an abscess was suspected. Magnetic Resonance Imaging (MRI) showed intracerebral abscess within the temporal lobe and the puss coming from it. After the diagnosis of exacerbation of chronic otitis media with cholesteatoma with intracranial complication the patient was qualified for a surgery and was given antibiotics i.v. After operation, on a CT scan, a loss of pneumatization was observable as well as clues for puss. After that, the patient was in a changing general condition, and he developed a peripheral paralysis of cranial nerve VII. Since then a gradual regression of the disease was observed.
Conclusions: Chronic otitis media with cholesteatoma is an exceptionally serious entity and may result in various complications, both temporal and intracranial. As for temporal, it may involve a peripheral paralysis of cranial nerve VII and inflammation of the surrounding tissues. Intracranial otherwise, may include brain abscess. This life-threatening condition may require a precipitous surgery and extended antibiotic therapy

INTERNAL CASE REPORT

Case report: deep neuropathic-ischemic diabetic foot ulcer at high risk of major lower limb amputation

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Introduction: Diabetic foot syndrome (DFS) followed by diabetic foot ulcers (DFUs) can lead to amputation, disability, and premature death. DFS requires a multidisciplinary approach and constitutes a challenge for national health care systems.
Results: A 67-years-old obese woman with type 2 diabetes (T2DM) and its chronic complications as well as numerous comorbidities was admitted to the Department of Metabolic Diseases and Diabetology at the University Hospital in Krakow after minor foot amputation with a deep, infected DFU of the left foot at a high risk of major lower limb amputation. At first, intravascular revascularization of left lower limb was successfully performed. The foot exam revealed a painless, deep, infected DFU with exposed bones in the wound bed and necrosis at the ulceration edges. The patient was diagnosed with mixed (neuropathic-ischemic) DFU and osteomyelitis. Most of the necrotic tissue was removed by surgical debridement and the cleaning process was subsequently continued. Deep swab was collected for testing while empirical wide-spectrum antibiotics were implemented. As a metabolic control a multiple daily insulin injection therapy (MDI) was continued. To facilitate the wound closure negative pressure wound therapy (NPWT) was used. Both, the advanced moist therapy (AMT) and the use of special dressings were applied. After 3 weeks of hospitalization the woman was discharged, and treatment was continued in Department's outpatient clinic till the complete wound closure. General rehabilitation without foot bearing was simultaneously performed.
Conclusions: This case is an excellent example of multidisciplinary approach in the DFS treatment. Offloading, revascularization, debridement, antibiotics administration, metabolic control, and an appropriate choice of additional DFU topical therapy enabled both prevention from the major limb amputation and the maintenance of the affected foot function. Nevertheless, a special boot is needed, and risk of DFU recurrence persists high.
Keywords: T2DM, DFS, DFU, revascularization, NPWT.

SURGICAL CASE REPORT

Case of synchronous skin melanoma and gallbladder carcinoma

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Introduction: Multiple primary tumors are defined as tumors arise in other organs as independent primaries which may occur as synchronous or metachronous primaries. According to the International Agency for Research on Cancer (IARC), the the diagnosis of synchronous primaries is made within an interval of less than 6 months. The purpose of our report is to present the case of synchronous primary tumors as skin melanoma and gallbladder carcinoma. (68)
Results: In May 2021 74-year-old woman was diagnosed due to pigmentary skin lesion localized on left foot. In June 2021 at Department of Oncological Surgery in Rzeszów she has performed surgical resection of the skin lesion. The histopathological examination confirmed the diagnosis of skin malignant melanoma with nodular subtype in stage pT3b. Histopatological examination showed blood vessels invasion but without invasion of nerves. In July 2021 the ultrasonography of abdomen showed that in region of gallbladder that was almost fully filled with heterogenous central vascularization. In August 2021 was performed resection of gallbladder and sentinel lymph node – no metastasis present. The histopathological examination showed the Mixed Neuroendocrine Non-Neuroendocrine Neoplasm (MiNEN) – Large Cell Neuroendocrine Carcinoma G3 (LCNEC) and adenocarcinoma of gallbladder. In October 2021 patient was directed to computer tomography examination – there is no neoplasm spreading. In another hospital was additional surgery – resection nearby to gallbladder part of hepatis and nearby

lymph nodes – one of them with metastasis from gallbladder cancer (cT2N1M0, stage 3B). Patient was qualified to complementary treatment gallbladder cancer – gemcitabine. Patient had not indications to complementary treatment of melanoma (second stage of melanoma). Patient is during chemiotherapy. According to interview patient has not any risk factors of this neoplasms. (205)
Conclusions: The question is whether there is a connection between presentation of those two neoplasms of different genesis (gallbladder cancer and melanoma). Getting sick with one malignant neoplasm does not exclude getting the next one. If neoplasm is metachronous necessary differentiation between the second cancer spread – it affects treatment. If synchronic and treated radically – then the problematic choice of adjuvant therapy. If spreading occurs – verification is important which neoplasm has spread. (73)
Keywords: Multiple primary tumors, surgical procedures in oncology, oncological cholecystectomy, melanoma excisional biopsy, gallbladder cancer, melanoma

A rare variation of the thoracic aorta and thoracic duct- a case report

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Introduction: A left circumflex aorta (LCA) is one of the rarest variations of the thoracic aorta. It is described as being a retroesophageal descending aorta that subsequently travels down the right side of the thoracic vertebrae towards the aortic hiatus. Nevertheless, its embryological origin should not be overly generalized, but each case should be considered individually due to its unique vascular pattern.
Results: The present study presents a description of a LCA in a 94-year-old male cadaver. The dissection revealed that the aorta had an abnormal course. It passed the trachea and esophagus posteriorly, and then descended laterally to the right from the thoracic vertebral bodies. The aortic arch had a typical branching pattern, and the left and right recurrent laryngeal nerves had a usual course. However, the thoracic duct was placed on the right and drained into the right internal carotid vein. Because of the normal appearance of the ascending part and the arch of the aorta, it is safe to assume that the variation originated from the persistent right dorsal aorta and the retroesophageal part from the persistent left dorsal aorta.
Conclusions: Thorough understanding of the variations of the thoracic aorta and the anomalies associated with LCA can help improve the management of these conditions and, consequently, improve the overall outcomes of patients. Patients with a LCA, or another vascular ring, can be asymptomatic or present with symptoms of esophageal and / or tracheal compression. Management of this anomaly consists namely of ligation of the patent ductus arteriosus / ligamentum arteriosum and aortic uncrossing.
Keywords: left circumflex aorta; thoracic duct; anatomy; embryology; anatomical variation

The use of forgotten Polish fixation system (ZESPOL) in case of highly complicated tibia fracture

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Introduction: Due to the lack of other method of fracture fixation, in 1970s plating was the most popular method of osteosynthesis. Unfortunately, in that time the outcomes were poor. The reason for that was isolation of Poland by Iron Curtain. The knowledge on proper plates application was limited due to limited access to the professional literature and courses. A need to improve the outcomes of fracture treatment inspired Polish professors W. Ramotowski, R. Granowski and J. Bielawski to create a Polish system of bone fixation ZESPOL in 1979. It is a system of microstabilizers which can be applied both as an external or internal fixator. In 1980s it was a basic system of bone fixation in Poland. Now, after introduction of modern and better implants, ZESPOL is not used in clinical practice.
Results: The 64-year-old homeless male patient suffering from pediculosis and scabies was admitted to Trauma and Orthopaedics Clinical Department of University Hospital in Cracow due to right tibia fracture (he slipped and fell down). In the past he suffered from bimalleolar fracture of right lower leg and from another fracture of proximal part of both right tibia and fibula. X-Ray examination had shown highly deformed axis of tibia, which was a contraindication for intramedullary nailing. Due to poor soft tissue condition classic plate fixation was also contraindicated (high risk of soft tissue necrosis). After exclusion of two standard treatment options, it was decided to apply the ZESPOL external microstabilizer to provide bone union. After 8 months the non-complicated bone union was shown on an X-Ray.
Conclusions: Our case outlines the value of old, sometimes forgotten, methods of operative treatment which can be used in cases when modern techniques are contraindicated, or even impossible to apply, due to highly complicated condition of patient.
Keywords: fracture, tibia, ZESPOL, osteosynthesis, fixation method

„Prepare for Trouble, and make it double" – two procedures leading to unifocalization of pulmonary arteries of an infant in TAC – case report

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Introduction: One of the rarest congenital heart defects (3%) is truncus arteriosus communis, which presents with a common arterial trunk suppling systemic, pulmonary and coronary circulation. There are few common accompanying cardiac anomalies. Around 20% of the patients with TAC have a genetic disorder – DiGeorge syndrome (22q11 microdeletion) consisting of immune deficiency, learning disorder, facial deformity and bone disorders. Early diagnosis and proper treatment is essential for preventing irreversible outcomes (when untreated, the predominance (up to 88%)1,2 of patients die within infancy due to heart failure). Hence, surgical treatment is advisable without any delay.
Results: A newborn with congenital heart disease, truncus arteriosus communis and ventricular septal defect, all three diagnosed prenatally, was admitted to the cardiology department of USD. An ECHO was performed, confirming previous diagnosis and exposing additional anomalies, such as fibroelastosis of papillary muscles and no PA's in typical location. CT-angio revealed 3 major aortopulmonary collateral arteries (MAPCAs). 2 months after birth the unifocalization of MAPCAs was performed with ECC which provided deep hypothermia. However, after the procedure, the child developed symptoms connected with increased blood flow in pulmonary circulation. Desaturation occurred, which could have been caused by limited ventriculotomy, and was treated with 20ppm of nitric oxide. The second procedure, performed 9 months after the first operation, consisted of VSD closure, enlargement of ventriculotomy, RVPA graft exchange – using Contegra 14mm, and reconstruction of confluens with 10mm stent implantation. As expected, it stabilized the pressure and the systolic activity of both ventricles. At the age of two, ECHO showed RV preasure < ½ sys. BP and good systolic function of both ventricles.
Conclusions: A repair technique called unifocalization can redirect the MAPCAs into the pulmonary artery, in addition to remedying the truncus arteriosus communis and restoring physiological circulation between lungs and heart.
Keywords: truncus arteriosus communis, unifocalizaton, major aortopulmonary collateral arteries, congenital heart disease, pulmonary atresia

Treatment of carcinoid tumor

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Introduction: A 49-year-old male was presented with symptomatic carcinoid heart disease (CHD), which derives from gastrointestinal carcinoid tumors. These rare tumors occur in 1-2/100 000 adults per year. The 5-year survival rate of CHD depends on the patient's clinical condition, right heart damage, function and structure of the tricuspid valve.
Results: The previously diagnosed with a primary carcinoid tumor in a small intestine with present distant metastases during treatment with a statin analogue was referred for treatment of severe tricuspid insufficiency. The patient presented symptoms such as diarrhea, redness of the face and body skin. Echocardiography showed dilation of the right atrium, right ventricle, moderate stenosis and regurgitation of pulmonary valve. Serum concentration of NT-pro-BNP was elevated. The patient was diagnosed with symptomatic tricuspid regurgitation and was qualified by the Heart Team for valve replacement surgery. A Perimount Magna Mitral 29 M bioprosthesis was implanted successfully. In the following four months patient underwent fragmental resection of the ileum where the primary tumor was located. Recently patient underwent reassessment. Currently he presents improvement in exercise capacity and NT-pro-BNP level, improvement in heart geometry in echocardiography.
Conclusions: In our patient, cardiac surgery facilitated clinical improvement and let the patient be safely operated for an abdominal tumor. However, at follow-up we observed deterioration of tricuspid valve which could result from the time delay between cardiac and abdominal surgery and an exposure of the prosthetic valve to carcinoid destruction. Our result call for immediate tumor resection after valvular replacement and a strict observation of the tricuspid prosthesis structure and function at follow-up.
Keywords: carcinoid tumor, cardiac surgery

CASE REPORT INTERNAL MEDICINE

Pelvic Congestion Syndrome (PCS) – still underdiagnosed cause of chronic pain in premenopausal women

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Introduction: The prevalence of chronic pelvic pain is approximately between 4% to 16% of women. It can be provoked by plentiful conditions, however in remarkable number of cases, chronic pain is the clinical manifestation of pelvic congestion syndrome (PCS).

Results: A 43-year old female presented with swelling and pain in the crotch. The patient reported everyday pain, more pronounced in evening hours, pain during intercourse or gynecological examination. After a few years of symptoms, pelvic congestion syndrome (PCS) was diagnosed with MRI and confirmed in TVUS. She was directed to an endovascular treatment. The patient went through 3 stages of embolization. Pain has decreased from 10 to 4 (VAS scale). Embolizations were performed with Seldinger technique through femoral vein access. Three-stage treatment comprised: insufficient left gonadal vein with reflux to uterine enlarged plexus. Left internal iliac vein venography revealed the reflux to uterine and vaginal plexuses with stasis of the contrast agent. Venography of the right internal iliac vein revealed widened venous parametrium plexuses and stasis of the contrast agent. The pathological vascular bed was embolized with coils and Aethoxysklerol (3%) foam.
Conclusions: Embolization is the best option for patients with pelvic congestion syndrome. It increases their quality of life and helps in better functioning. However, the aim is to appease the pain, and in many cases it has to be repeated, as the complaints are coming back.
Keywords: embolization, pelvic congestion syndrome, magnetic resonance

CARDIOLOGY

Clinical observation and long term follow-up of patients with light-chain (AL) cardiac amyloidosis

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Introduction: In amyloid light-chain (AL) amyloidosis heart involvement bears the worst prognosis of any involved organ with median survival time among untreated patients being less than 6 months, hence early recognition is essential in impeding disease progression and preventing complications.
Aim of the study: Assessment of select clinical parameters, mortality and prevalence of complications in patients with AL cardiac amyloidosis.
Material and methods: Medical records of 19 patients were prospectively analysed. Follow-up was conducted through telephone contact or visits in the clinic.
Results: The research group consisted of 12 women and 7 men, all with AL cardiac amyloidosis. Median age was 65,42 with a standard deviation (SD) of 10,86. Patients presented an average of 2,9 in NYHA class (SD=0,8). On admission the median level of creatinine was 127,33 (SD=71,94) and NT-proBNP 34050,9 (SD=69794,3). Seven patients (36,84%) presented amyloid kidney involvement. Median observation time was 14 months (SD=14,89). At follow-up it was found that 12 patients (63,16%) had died, median time of survival was 164,75 days (SD=171,06). The majority of deaths (91,67%, n=11) were a result of a cardiovascular complication, predominantly heart failure (83,33%, n=10). Hospitalisation due to exacerbation of heart failure was reported in 12 patients (63,16%), half of which were hospitalised more than once. Thromboembolic complications were observed in 3 cases (15,79%), 2 of those were ischemic strokes. Hemorrhagic events were also reported in 3 cases: two isolated gastrointestinal or pulmonary, one both gastrointestinal and intracranial. Kidney failure requiring dialysis developed in 2 cases (10,53%).
Conclusions: AL cardiac amyloidosis carries a high prevalence of complications and mortality, especially from cardiovascular reasons. Preventing further disease progression while managing underlying heart failure appears crucial for improving outcomes.
Keywords: AL amyloidosis, cardiac amyloidosis

Left internal mammary artery sex-related operative topography for the minimally invasive coronary artery bypass grafting (MIDCAB)

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Trustee: Radosław Litwinowicz, MD, PhD, DSc, Associate Professor

Introduction: Despite the increased interest in minimally invasive coronary artery bypass grafting (MIDCAB), there is a noticeable lack of studies comparing the surgical anatomy and relationships of the left internal mammary artery (LIMA).
Aim of the study: The main objective of this study was to evaluate whether there were statistically significant differences in LIMA topography according to patient sex.
Material and methods: Pre-operative angio-CT of 49 women (W) and 55 men (M) were analysed using 3D image processing software. Various measurements were designed with a reference point of 4th costal cartilage level using sternal body middle point (SBMP). The topography of the LIMA in relation to the left coronary artery (LCA) or its descending branch (LAD) was assessed. Data were statistically processed to compare LIMA within sex groups.
Results: There were significant differences in LIMA parameters. LIMA width were W:2.6±0.3mm, M:2.7mm (p=0.04); the SBMP to the distal LIMA bifurcation length W:5.9±1.2cm, M:6.5 cm (p=0.02); the SBMP to LIMA distance W:3.0±0.4cm, M:3.4±0.4cm (p=0.00); the LIMA to the sternal line W:1.6±0.3cm, M:1.8±0.3cm (p=0.00); the xiphoid end and the distal LIMA bifurcation W: 3.6±0.7cm M:4.5±0.7cm (p=0.00). The distances between LIMA and the LCA were W:6.3±1.1cm, M:7.6±1.3cm (p=0.00) at the proximal and W:6.5cm, M:7.6±1.2cm (p=0.00) at the distal level. The LIMA-LAD distance were significantly different

only W:5.3±1.0cm, M:5.8±1.1cm (p=0.04) proximally with W:4.4±1.2, M:4.5 (p=0.56) cm at the middle; W:4.2±1.6cm, M:4.2±1.4cm (p=0.91) at the distal level. The most common position of distal LIMA bifurcation was the 6th intercostal space W:63%, M:69%.
Conclusions: The topography of the LIMA statistically differs according to the patients' sex, excluding its relation to the middle and distal LAD, which should be taken into account when performing MIDCAB. Knowledge of the surgical anatomy of the LIMA is crucial to minimize the risk of complications of the procedure.
Keywords: left internal mammary artery, MIDCAB, minimally invasive procedures, cardiothoracic surgery, surgical anatomy

Analysis of comorbidities and select clinical parameters in patients with valvular heart disease depending on age – one center experience

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Introduction: Among patients with valvular heart disease age is a significant contributing factor in the differences in clinical presentation, parameters and comorbidities.
Aim of the study: Assessment of age-related differences in patients with valvular defects with the analysis of select clinical parameters and comorbidities.
Material and methods: Medical histories of 683 patients with valvular heart disease were retrospectively analysed. The study group was divided into two subgroups depending on age: patients aged 65 and over (n=453) and patients under 65 (n=230).
Results: The number of females was significantly higher in the older group (43,3% vs 32,6%; p=0,007). Aortic stenosis patients were also significantly older (p=0,004). In past medical history a significant difference was only observed in the number of CABG procedures (p=0,002) and pacemaker implantations (p=0,005) both being more predominant in older patients, interestingly there was no significant difference in the number of PCI procedures, CRT or ICD implantations nor in the number of patients with heart failure. However there was significantly higher percentage of older patients with hypertension (64,3% vs 86,3%), dyslipidemia (61,2% vs 75%), diabetes (19,4% vs 65,3%), carotid and vertebral arteriosclerosis (1,4% vs 7,3%), chronic kidney disease (13,7% vs 32,5%) and intermittent claudication (5,7% vs 14,8%) all with p<0,001. Analysis of quantitative variables in the U-Mann Whitney test showed significant differences in bloodwork parameters such as eGFR and creatinine (both p<0,001) and in transthoracic echocardiography in RVSP (p<0,003), LVd (p<0,002) and IVSd (p=0,009) values.
Conclusions: In the studied group significant differences between younger and older patients were observed, yet more research is necessary to fully understand the differences that age makes in patients with valvular heart disease.
Keywords: valvular heart disease, age, comorbidities

Objective and subjective assessment of heart failure symptoms in patients with dilated cardiomyopathy during optimization of pharmacotherapy

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Introduction: The heart failure (HF) symptoms in patients with dilated cardiomyopathy (DCM) are mostly associated with left ventricle (LV) remodelling and systolic dysfunction. The optimization of HF treatment in HF and DCM leads to left ventricle reverse remodelling (LVRR), which prolongs lifespan and reduce HF symptoms. However, the impact of HF therapy on symptoms during LVRR in DCM is unknown.
Aim of the study: The objective and subjective assessment of HF symptoms in DCM during LVRR.
Material and methods: The study population was composed of 102 patients with DCM (aged 45.2 ± 11.8, 87.3% male, symptoms' duration 16.2 ± 23.3 months). At baseline and 12-month follow-up (12MTH) clinical assessment, echocardiography and 6-Minute Walk Test (6MWT) were performed. The subjective assessment of exercise tolerance was assessed with NYHA scale, the objective – with 6MWT.
Results: During 12MTH NYHA class (1,81 ± 0,62 vs. 1,36 ± 0,49, p<0,001) and 6MWT distance (446.2 ± 91.4 vs. 506.4 ± 92, p<0.001) improved. Patients with and without LVRR had similar baseline HF symptoms (NYHA class: 1.82 ± 0.61 vs. 1.69 ± 0.56, p=0.35; 6MWT: 457.8 ± 84 vs. 440.8 ± 93.5, p=0.334) and at 12MTH (NYHA class: 1.28 ± 0.42 vs. 1.43 ± 0.54, p=0.275; 6MWT: 512.9 ± 100.5 vs. 500.6 ± 85.3, p=0.644). However, LVRR-present patients had lower at baseline (23.6 ± 9.3 vs. 35.1 ± 7.6, p<0.001 and higher LVEF at 12MTH (43.9 ± 9.4 vs. 33.9 ± 9.8, p<0.001). During follow-up in LVRR-present group LVEF, NYHA class and 6MWT improved (all p<0.05). While in LVRR-absent group improvement in HF symptoms were observed (all p<0.05), but not in terms of LVEF (p>0.05).
Conclusions: During 12mth 45% DCM patients had LVRR. Patients without LVRR had higher LVEF at 0mth and lower at 12mth. However, LVEF improved only in LVRR-present group, in both groups HF symptoms' improvement was observed.
Keywords: HF symptoms, cardiomyopathy, HF therapy, LV remodelling

Morphology of the left atrial appendage neck

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Introduction: The anatomical description of the left atrial appendage (LAA) is mainly focused on the shape and size of its main body, despite the fact that various procedures are performed on the proximal part of this structure.
Aim of the study: The aim of this study was to precisely describe area between LAA orifice and the LAA lobular part, defined as the LAA neck with evaluation of differences between the LAA morphological types.
Material and methods: The left atrium and LAA were segmented from 150 contrast enhanced computed tomography scans and further analyzed using three dimensional, semi-automatic algorithms. The LAA type was evaluated based on simplified shape-based classification system.
Results: The LAA neck has truncated cone shape, with elliptical proximal and distal bases. The proximal base diameter were: long: 26.4±4.9 mm, short: 18.3±4.0 mm and the distal base diameters were: long: 19.3±3.9 mm, short: 14.7±3,2 mm. The area of the neck bases was 390.5±145.0 mm2 (proximal) and 228.2±85.5 mm2 (distal) ($p<0.001$). The arrowhead type had significantly larger proximal (433.2 to 366.6 mm2 $p<0.001$) and distal (249.2 to 211.3 mm2 $p<0.05$) bases dimensions than chicken wing type. The total length of the neck (measured between bases centers) was 12.3±2.9 mm. The LAA neck wall can be divided into 3 parts: venous part (borders with left sided pulmonary veins, length: 15.9±4,6 mm), coronary part (borders with left coronary artery tree, length: 6,4±2,0 mm) and mitral part (borders with mitral valve annulus, length: 11,1±2,7 mm) ($p<0.05$).
Conclusions: The LAA neck has truncated cone shape, with elliptical bases. The LAA neck can be divided into 3 walls of unequal length adjacent to vital structures of the heart (pulmonary veins, coronary artery and mitral annulus). The complex structure of LAA neck should be considered during planning and performing interventions targeted to LAA.
Keywords: Left atrial appendage, heart, three dimensional visualisation, computed tomography

Knowledge on atherosclerosis risk factors in a group of patients with acute and chronic coronary syndrome – a survey research

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Introduction: Cardiovascular diseases are the leading cause of mortality in developing countries. The most common cause of myocardial infarction (MI) is atherosclerosis of the coronary arteries. Among risk factors of atherosclerosis arterial hypertension, diabetes mellitus, nicotine addiction and unhealthy diet can be mentioned. Therefore, it is essential to raise awareness of the risk factors to prevent cardiovascular diseases development. According to latest research, it is crucial to educate patients with MI history as a part of secondary prevention.
Aim of the study: The purpose of this study was to assess overall comprehension of atherosclerosis risk factors in patients with Acute Coronary Syndrome (ACS) and Chronic Coronary Syndrome (CCS).
Material and methods: The research is an observational survey study. A questionnaire survey by face-to-face interviews was performed among patients hospitalized in the University Hospital in Cracow. Qualification criteria were either ACS diagnosis or CCS diagnosis with the previous vascular incident. In the main part of the survey, patients had to answer whether particular factor is or is not correlated with atherogenesis. Patients obtained one point for each correct answer (max 30 pt).
Results: Altogether, 116 patients with ACS/CCS (43/73, respectively) were included in the analysis (mean age: 68.3±11 years). The average score was 19.7 (65.6%) points. Patients with ACS had significantly lower scores compared to CCS patients (18.2±5.3 pt vs. 20.7±3.4 pt, $p=0.022$, respectively). Patients with first ACS had lower scores than CCS patients ($p=0.18$). There were nearly no differences between scores in patients with first episode of ACS and subsequent ACS ($p=0.93$). According to the education level, patients with higher education had better results than patients with primary education (21.0 pt vs. 17.8 pt, $p=0.016$, respectively).
Conclusions: The overall knowledge on atherosclerosis risk factors in respondents is unsatisfactory. Thus, it is important to increase patients' awareness of the given topic, improving patients' adherence during treatment and changing their lifestyle behaviors.
Keywords: atherosclerosis, risk factors, acute/chronic coronary syndrome, survey

The connection between coronary and endothelium dysfunction

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Trustee: Bartłomiej Guzik, MD, PhD, FESC, Łukasz Niewiara, MD, PhD

Introduction: Coronary microcirculation dysfunction is a frequent finding in patients with myocardial ischemia but without significant coronary stenosis (INOCA). The pathogenesis of INOCA is not well established yet. One of the possible explanations could be systemic and coronary endothelium dysfunction.
Aim of the study: The purpose of the study was to determine the role of endothelium dysfunction in changes in the Index of microcirculatory resistance.
Material and methods: In 215 patients undergoing coronary angiography, who had no coronary stenosis found, invasive assessment of coronary microcirculation was performed. Additionally, in 50 patients we performed flow-mediated dilatation assessment (FMD) after 1 minute and 2 minutes.
Results: In our group, 33 (66%) were male, with a mean age of 67,3 years. 48(96%) patients presented with arterial hypertension, 24 (48%) with diabetes. 26 (53,1%) were non-smokers. A linear correlation was demonstrated between IMR and FMD 1 minute r=-0.33 p=0.021 and after 2 minutes r=-0.27 p=0,055.
Conclusions: We found that the endothelium dysfunction parameter correlates with increased coronary microcirculation resistance.
Keywords: coronary microcirculation resistance, endothelium dysfunction, ischemia with no obstructive coronary arteries

Long-term outcomes in patients with myocardial infarction and non-obstructive coronary arteries (MINOCA)

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Introduction: Non-obstructive coronary stenosis occurs in 20-35% of patients with clinical presentation of acute myocardial infarction. The group is known to be heterogenous. Although revascularisation is not required, the prognosis remains poor.
Aim: The study aimed to identify factors modifying the occurrence of composite endpoint in long-term follow-up.
Materials and methods: All 110 consecutive patients with a known diagnosis of MINOCA enrolled in this single-centre, prospective study were provided with standard of care. Typical diagnostic modalities were conducted. Clinical follow-up was performed 12, 24 and 36 months after hospital discharge. Normal distribution was assesed by Kologorov-Smirnov and Shapiro-Wilk test, the qualitative and continuous variables were compared using chi-squared and t-student test, respecitvely.
Results: While 38.2% of the enrolled patients were male, the mean age and BMI of the study group amounted to 64.9 years and 27.7 kg/m2. The prevalence of arterial hypertension (69.1%) and diabetes type 2 (19.1%) was comparable to the general population. In COX proportional hazards model analysis older age (HR 1.33;95%CI 1.03-1.71), diabetes type 2 (HR 2.41;95%CI1.21-4.82), history of neoplasm (HR 3.2;95%CI1.46-7.02), ST-segment depression (HR 2.49,95%CI1.44-6.96) and left bundle branch block/right bundle branch block (LBBB/RBBB) (HR 3.16; 95%CI1.44-6.96) in ECG on discharge, Gensini score (HR 1.18;95%CI1.02-1.35), intraventricular septum (HR 1.48;95%CI1.11-1.96) and posterior wall thickness (HR 1.66;95%CI1.23-2.23) were proven to be risk factors for primary composite endpoint occurrence. Kaplan-Meier estimator indicates that primary composite endpoint free survival is worse in patients with LBBB/RBBB (p=0.011) and the history of neoplasm (p=0.0068).
Conclusions: The most important factors modifying the risk of long-term outcomes in patients with MINOCA were both: LBBB/RBBB present in ECG on discharge and the history of neoplasm. (Abstract character count: 280)
Keywords: MINOCA, non-obstructive coronary stenosis, myocardial infarction, LBBB, RBBB

CASE REPORT PEDIATRIC

Therapeutic challenges of congenital hemophilia B in a preterm newborn

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Introduction: The prevalence of preterm deliveries systematically decreased over the past years. Concurrently, providing satisfactory outcomes remains a significant challenge due to the increasing survival rate of extremely premature infants. Routine care of a preterm newborn is associated with more frequent exposure to invasive procedures. Thus, symptomatic hemophilia requires numerous modifications of the standard management.
Results: This study reports a case of a male newborn with congenital hemophilia B, delivered prematurely via cesarean section at 29 weeks of gestation. At birth, the child presented dyspnoea and was admitted to the NICU with non-invasive respiratory support. In laboratory tests, prolonged aPTT was observed and consequently, the child received plasma transfusion. Further assessment of the coagulation system confirmed deficiency of factor IX and XI. Ultrasound examination revealed correct function of the heart. Administration

of factor IX was scheduled and routine procedures (eg. vaccinations) were modulated in order to minimize the risk of bleeding.

Conclusions: This case report illustrates the difficulties encountered by health professionals in the management of preterm newborns with coagulopathies. The decision-making process should involve careful assessment of the severity of disease and attainably harmless prevention of the consequences of prematurity. Adequate treatment of both conditions enables most patients to develop correctly.

Keywords: neonatology, hematology, hemophilia B, prematurity

Public Health, Nursing, Dentistry

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List of papers

The assessment of televisits during the pandemic based on the online patients' opinions

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Introduction: Websites collecting patients' opinions became a parallel, to formal routes, way of quality assessment in health care. Although heavily contested by some authors, they may be valuable feedback about services provided by healthcare providers.
Aim of the study: The main aim of the study was the analysis of the opinions entered by patients about remote visits delivered by physicians in Poland during the COVID-19 pandemic.
Material and methods: The analysis was based on 4524 patients' opinion scraped with WebHarvy software from rankinglekarzy.pl from March 2020 till January 2022. From this set, opinions related to remote visits were searched for with appropriate key words and analyzed based on qualitative approach.
Results: Finally, 138 opinions were included in the analysis; 51.4% (n=71) for internists, 30.4% (n=42) for family physicians and 18.1% (n=25) for pediatricians. Physicians providing televisits more favorably assessed by patients, received also more positive opinions in general (mean score, SD: 3.73 (1.35) vs 2.06 (0.87), p<0.001). Only 13.8% (n=19) opinions were positive and remaining 86.2% (n=119), negative. The most frequent reasons of negative opinions included the lack of interest from a physician (60.9%, n=84), impoliteness (56.5%, n=78), and superficial contact from a physician (49.3%, n=68). In all 19 positive opinions, patients appreciated devoted time, the interest in patient's problem and ability to address issues. Overall assessment of telemedical contact was not related to the specialty, the number of specialties and PhD degree of the physicians providing teleadvice. Superficial contact from physician was signaled more often by those receiving teleadvice from pediatricians than from internists and family physicians (89.5% vs 47.4% vs 52.3%, chi2 test, p=0.007).
Conclusions: Overall online assessment of televisits during the pandemic is negative. The prevalence of specific reasons for such opinions only to small degree depended on the type and number of specialties or having PhD degree.
Keywords: pandemic, televisits, online assessment, physicians' ranking, patient satisfaction

Qualitative Study of Occupational Burnout Among Paramedics in Poland through the course of the COVID-19 Pandemic

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Introduction: The COVID-19 Pandemic has significantly increased workload of all healthcare workers in Poland, making them victims of occupational burnout. Paramedics are an often overlooked group of frontline workers who experience substantial physical and emotional burden as a consequence of the harsh magnitude of the COVID-19 Pandemic.
Aim of the study: The study aimed to determine which associated factors contributed to burnout amongst Polish paramedics in different periods of the COVID-19 Pandemic.
Material and methods: Self-reported data from a web-based sample of Polish paramedics (N=80, 69% male) was collected through social media platforms during the period between 01.2021 and 03.2022 . It consisted of socio-demographic questions, the Oldenburg Burnout Inventory (OLBI), customized questions about COVID-19 related work burdens, and qualitative questions to determine which factors contributed to their burnout.
Results: Mean total score on the OLBI scale was 43.9, indicating a moderate severity of burnout (score > 44). 50% of participants declared the beginning of the COVID-19 pandemic, Spring 2020, to be the most challenging period for them. Principal factors contributing to stress at this time were observed to be lack of knowledge, organization and preparation, in terms of insufficient regulations, lack of PPE (Personal Protective Equipment) and shortage of inpatient beds. 30% and 26.3% of participants declared the post-vaccination periods of Spring and Winter 2021 to be the most difficult, respectively. Risk factors shifted to increased workload due to healthcare workers falling ill to COVID-19, and frustration towards the increasing population of unvaccinated patients. Additionally, growing absence of support from higher authorities became an evident cause for their distress.
Conclusions: The prevalence of burnout among paramedics was high according to our study. The primary burdens experienced were varied through the different periods of the COVID-19 Pandemic. Thus, the support aimed at burnout prevention should be flexible as well, in order to adjust to the dynamically changing circumstances.
Keywords: COVID-19, Occupational Burnout, Paramedics

COVID-19 pandemic impact on nursing student clinical education – qualitative research

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Introduction: The COVID-19 pandemic significantly influenced to the organization of clinical education for nursing students, forcing them to undertake practical education in previously unusual conditions. Nursing as a caring profession faced problems caused by the suspension of clinical classes or the transition to distance learning, generating a serious crisis in the academic functioning and psychophysical health of nursing students. The aim of the research was to study the personal experiences of nursing students related to clinical education during the COVID-19 pandemic.
Material and methods: Individual, semi-structured interviews with undergraduate and graduate nursing students who participated in clinical training in various clinical areas during the COVID 19 pandemic in 2020-2021. All interviews were recorded, transcribed, coded and subjected to thematic analysis. The study protocol was approved by the Bioethics Committee of the Medical University of Lublin (KE-0254/289/2020).
Findings: The analysis of the material collected from the students (n = 20) allowed to identify five main thematic areas: (1) the key role of the clinical mentor; (2) the distance between theory and practice; (3) ambivalent emotions and ethical challenges; (4) a feeling of being part of a therapeutic team; and (5) a strengthened professional identity.
Conclusions: Clinical education during the COVID 19 pandemic has resulted in many experiences of nursing students showing the nursing profession in a new light. Students perceived themselves as an important element of the health care system, working on the front lines together with other health professionals, but they also experienced many barriers in the development of professional competences. The study highlighted the instability of clinical nursing education during the pandemic. Clear guidelines and recommendations are needed to ensure the safety of medical education during epidemic crises in the future.
Keywords: clinical education, nursing students, qualitative research, COVID-19 pandemic, professional education.

Effects of water quality on the properties of alginate impressions –an in vitro study

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Trustee: Andrzej Gala, MD, PhD

Introduction: Alginate impression materials are the most commonly used among dentists. Setting of hydrocolloid material is based on the ionic reaction between carboxylic groups and calcium ions and may therefore be affected by ionic species present in the water.
Aim of the study: The purpose of this study was to evaluate whether the hardness of the water affects weight of alginate impressions in time and whether the hardness of water has an impact on dimensions' stability of the impressions.
Material and methods: Alginate impression materials were prepared with exact amount of various types of water (tap water, soft and hard water, 11 samples each). Every sample was weighted after 3, 30, 90 mins and 30 hours. The statistically significant differences between groups were assessed by ANOVA (repeated measures), T-test and other methods where appropriate. Additionally in our research descriptive statistical analyses were performed. For statistical analysis R software v.4.1.3 was used.
Results: The results of statistical analyses revealed that significant changes in the weight of the impressions taken with the use of the softest water and the hardest type of the water used in the study as the alginate impressions set with the hardest water tend towards losing water sooner.
Conclusions: When mixing alginate materials, it is necessary to be aware of the fact that the process of setting of the impression material can be significantly affected by the hardness of the water.
Keywords: water hardness, dental impression materials, irreversible hydrocolloids, weight changes,

Surgery

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List of papers

Impact of surgical complications on the loss of weight in bariatrics

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Trustee: Natalia Dowgiałło-Gornowicz, MD, PhD

Introduction: Bariatric surgery is an effective method of obesity treatment. Surgery is associated with early complications, most of which are minor, present at 3-7%. The serious complications and mortality rate is below 1%.
Aim of the study: The purpose of the study is to evaluate the outcomes of bariatric surgery complications on the results of surgical obesity treatment.
Material and methods: A total of 1071 patients underwent sleeve gastrectomy in the Department of General, Minimally Invasive and Elderly Surgery in Olsztyn in 2013-2018 according to the standard technique. Information about complications was extracted from the surgeon's varia. 392 randomly chosen patients were also surveyed via personal or telephone consultations. The research examined changes in patients' body weight 2 years after the surgery.
Results: The follow-up rate was 58.93%. During 231 surgeries 11 complications occurred. Complications were assessed using Clavien-Dindo Classification: Grade I for 3; Grade II for 5; Grade III for 3 cases. Group organising patients without complications (N = 220) achieved a mean BMI of 29.79 [SD, 5.56] and mean %EBMIL of 99.40 [SD, 28.91]. Group organising patients with complications (N = 11) achieved mean BMI of 32.32 [SD, 6.15] and mean %EBMIL of 79.07 [SD, 36.57] which is a significant decrease (P < .03).
Conclusions: Bariatric surgeries are a good method of obesity treatment. In this small cohort and short follow up period the expected result of bariatric treatment implies to decrease if surgical complications occur, however, future research is needed.
Keywords: sleeve gastrectomy, surgical complications, Clavien-Dindo Classification, retrospective study

Has emergency surgery changed during the COVID-19 pandemic? Single surgery department experience

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Trustee: Mirosław Dolecki, MD, PhD

Introduction: Acute abdomen is a condition that requires urgent surgical attention and treatment even if patients have comorbidities or contraindications.
Aim of the study: The aim of the study was to compare the surgical treatment of acute abdomen between patients with and without COVID-19 infection.
Material and methods: 566 patients with acute abdomen were divided into two groups: A – included 476 patients who were hospitalized in 2019 in the Department of General Surgery before "the era of COVID-19" and B -included 90 patients with acute abdominal symptoms and COVID-19 infection. The causes of acute abdomen, treatment methods, time "admission-operation", microbiology, and postoperative morbidity and mortality rate were analyzed.
Results: The reasons for hospitalization in both groups were peritonitis, mechanical obstruction, hemorrhage into the lumen of the digestive tract, hemorrhage into the peritoneal cavity, and acute intestinal ischemia. In group A 72.3% of patients were operated on, in group B 54,4%. The average time of "admission-operation" in group A was 14,1h and 54,2h in group B. Bacteriology was taken for examination from 34,1% in group A and from 64,3% in group B. There was noticed the difference in the spectrum of origin of microbes. Complications occurred in 25,8% in group A and in 36,6% in group B. (because of a higher number of non-surgical complications). There were confirmed 12.4 % of deaths in group A and 21.1% in group B.
Conclusions: Peritonitis was the most common reason of acute abdomen in both groups. Statistically significant more patients undergo conservative treatment in group B. There was noticed a difference in „admission-operation" time, but no difference in the time of operation. The spectrum of cultured microorganisms is different in both groups. There was a significant difference in the number of deaths and postoperative complications.
Keywords: Acute abdomen, COVID-19, surgical treatment

Preoperative prognostic factors predicting postoperative outcomes in elderly patients undergoing liver surgery

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Introduction: In recent years the amount of elderly patients affected by liver tumors has been gradually increasing. Potential causes are: ageing of the society, overall higher incidence rate of liver malignancies and improvements in treatment of chronic liver diseases. Because of underrepresentation of elderly patients in clinical trials and general belief that older age is related with worse surgical outcomes, some surgeons are still hesitant to propose surgical management as a part of the treatment.
Aim of the study: The aim of the study was to investigate whether there are any preoperative factors increasing the risk of postoperative complications in geriatric population undergoing liver surgery.
Material and methods: The study included perioperative data of 52 patients ≥65 years old who underwent liver surgery (liver resection or hepatic thermal ablation) in our Department between 06.2016 and 10.2021. Patients were divided into 2 groups regarding whether they suffered postoperative complications or not. Statistical analysis has been performed using Statistica and SPSS software.

Results: 15 patients (28,85%) suffered from postoperative complications with no 30-days mortality. The higher tumor grading score was the only statistically significant factor (p = 0,05) indicating further postoperative complications while male sex was slightly above statistical significance (p = 0,055). Patients with HCC (n = 14) suffered only from medical complications (n = 5), while the majority of patients with metastatic tumors (n = 21) suffered from surgical ones (n = 4) (p = 0,023). Differences in age, BMI, ASA score, Charlson Comorbidity Score, number of comorbidities, number of drugs taken, preoperative laboratory tests results, type of tumor (primary or secondary) and TNM classification between groups were not statistically significant.
Conclusions: Our study showed that factors such as age, ASA score or number of comorbidities, which currently play a key role when qualifying patients for surgical procedures, should not be determinant when deciding whether elderly patients with liver tumors should undergo surgery. Chronological age should not be a contraindication for the surgery.
Keywords: liver surgery; geriatric surgery; postoperative outcomes

Significance of current preoperative factors in outcome prediction of older patients operated due to pancreatic neoplasms

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Introduction: Despite a huge improvement in surgical technique and perioperative care in the field of pancreatic oncological surgery, the risk of morbidity and mortality is still significant. Especially in the elderly in which natural reserves are depleted.
Aim of the study: The aim was to investigate preoperative prognostic factors predicting postoperative outcomes of elderly patients operated due to pancreatic neoplasm.
Material and methods: Preoperative, perioperative data and postoperative outcomes were collected. The inclusion criteria were: age ≥60, radical surgical treatment due to pancreatic neoplasm or periampullary area. Analysis was performed using chi2, U Mann-Whitney or Kruskall-Wallis tests and Spearman correlation.
Results: 103 patients met the inclusion criteria. The age median was 72 years (60-90) and there was a predominance of female (54.37%). Patients were divided into three age groups: 60-69 (n=39), 70-79 (n=53) and ≥80 (n=11). There were no significant differences in preoperative BMI, polypragmasy or number of comorbidities, but Charlson Comorbidity Index (CCI) and ASA were significantly higher in older groups. A variety of Perioperative outcomes were analyzed, but no significant differences were revealed. Only length of stay differed significantly with medians: 8, 13 ,8 days respectively (p=0.0432). Analyzing various laboratory results, the only significant difference referred to the lymphocytes, with median values decreasing with age (p=0.0256). Comparing patients with CD <3 or ≥3 there were no significant differences in preoperative features, laboratory or perioperative results. Correlations between preoperative features and laboratory tests vs postoperative outcomes were tested, but none of them were strong or moderate.
Conclusions: The results indicate that currently available preoperative data or laboratory tests do not allow to predict further postoperative course. We also did not reveal any differences between patients with severe or mild complications. In the light of the results, we conclude, that current methods used to describe elderly patients' status are insufficient to predict their outcomes.
Keywords: older patients; pancreatic cancer; pancreatoduodenectomy; elderly

Spectrum, characteristics and comparison of microorganisms obtained from peritoneal cavity in patients with mechanical ileus and with diffuse peritonitis

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Introduction: Mechanical ileus and diffuse peritonitis are among the most common surgical disorders, which may lead to life-threatening acute abdomen. In many cases of those afflictions we find pathological microorganisms in peritoneal cavity. Suggested post-operative management may depend on culture results – detected microorganisms and their characteristics.
Aim of the study: Our purpose was to compare the spectrum and characteristics of microorganisms grown from the peritoneal cavity fluid in patients with mechanical ileus and in patients with diffused peritonitis.
Material and methods: We gathered data of 657 patients hospitalized in years 2013-2019 due to mechanical ileus or diffused peritonitis in General Surgery and Multiorgan Trauma Clinic of University Hospital in Cracow. We divided patients according to their affliction and excluded those who were not operated and those who did not have culture examination performed (Group A – mechanical ileus, n=68; Group B – diffuse peritonitis, n=80). To find microbiological differences between groups we compared: species diversity, alert species, antibiotic resistance, MIC and BMQ.
Results: The most common group of microorganisms was Gram-negative Enterobacteriaceae (27% in Group A vs. 36% in Group B, p=0.25). Worth mentioning disproportion was observed in fungi group (7.0% vs. 15.2%, p=0.059). Conspicuous differences were proven in Staphylococci and Streptococci group (19.1% vs. 10.4%, p=0.025) and in negative cultures (27.9% vs. 15.0%, p=0.032). Number of alert species were not statistically significant (n=18 vs. n=29, p=0.358). In majority

of species the antimicrobial resistance were not clinically significant, but MIC statistical significence was shown in case of Cefepime (p=0.05) and Cefotaxime (p=0.02).
Conclusions: Although the mechanism of microorganisms translocation from intestines to peritoneal cavity is different in described afflictions, the diversity of species is not so significant as we previously expected. Our study shown that some species detected in diffused peritonitis are more sensitive to defined antibiotics than to others.
Keywords: Ileus, diffused peritonitis, acute abdomen, microbiology, bacteriology, antibiotic resistance

Analysis of factors increasing odds for type 2 diabetes mellitus remission after revisional bariatric surgery of laparoscopic sleeve gastrectomy

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Introduction: Bariatric surgery is currently the most effective and long-lasting treatment of morbid obesity. The curative effect of bariatric surgery on the type 2 diabetes mellitus (DMT2) has been proven and is very effective as compared with the conservative treatment. Despite efficacy of bariatric surgery, some patients may experience weight regain or have no remission of DMT2 or even experience the relapse of DM2. In that case, the patient could be treated conservatively or referred for a revisional bariatric surgery (RBS).
Aim of the study: The study aimed to determine which factors are increasing odds for DMT2 remission after revisions of laparoscopic sleeve gastrectomy.
Material and methods: A retrospective cohort study was conducted to analyze consecutive patients who underwent revisional surgical treatment for morbid obesity in 12 referral bariatric centers in Poland from January 2010 to January 2020. The study population was divided into two groups: 1-patients with DMT2 remission after RBS (n=28) and 2-patients without DMT2 remission after RBS (n=49). DMT2 remission was defined as no need for anti-diabetic medication and HbA1c<6.5%, glycemia within normal range. Follow-up was completed 12 months after revisional bariatric surgery.
Results: 77 patients, 57 females and 20 males were included in the study. Mean age was 51.0±9.9 years. In multivariate logistic regression the median body mass index (BMI) after the procedure and median percentage of excess BMI loss (%EBMIL) from the maximal lifetime BMI were associated with increased probability of DMT2 resolution. Thus, it occurred that achieving EMBIL>60.7% was associated with a 12.48 (95%CI 2.66-58.42, p=0.001) greater chance of DMT2 remission. Achieving BMI<33kg/m2 after RBS increases the chance of DMT2 remission by 3.39 times (95%CI 1.28-8.95, p=0.014).
Conclusions: : The study suggest that factors with an increased likelihood of DMT2 remission after RBS are achieving %EMBIL>60.7% from maximum lifetime BMI and having a BMI<33kg/m2 after RBS.
Keywords: bariatric surgery, obesity, DM2, diabetes

Clinicopathological features of resected primary pancreatic neoplasms in geriatric patients

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Introduction: Pancreatic cancer predominantly affects patients who are at least 65 years old (yo). Likewise, the incidence of precancerous lesions is age-related. Given the low rates of receiving surgical treatment among the elderly, differences in the characteristic of resected neoplasms compared to younger patients were expected.
Aim of the study: Our study aimed to investigate the clinicopathological features of pancreatic neoplasms in geriatric and younger patients eligible for surgical treatment.
Material and methods: We obtained data from records of patients hospitalized in the Department of General Surgery between 2019 and 2021. Those who had met eligibility criteria were divided into four groups: „<65yo", „65-74yo", „75-84yo", „≥85yo". We used the Fisher exact and Mann-Whitney U test to compare variables between patients younger and equal to/older than 65 years. We also searched for differences between „65-74yo" and „75-84yo" groups. When appropriate, Spearman's rank correlation test was performed.
Results: Among 106 included cases, 59 (55.65%) were at least 65 years old. We did not find statistically significant differences in the pathological stage or grade of neoplasms diagnosed in geriatric versus non-geriatric patients. Likewise, the median numbers of collected and positive lymph nodes were not differentiating factors. However, we found significant divergence (p=0.006) in the distribution of histological types between mentioned groups. Precursor cystic lesions of pancreatic adenocarcinoma had a higher incidence in the „≥65yo" population, whereas the frequencies of cancers were similar in both analyzed groups. In the elderly, unlike younger patients, there was a strong positive correlation between grade and pT of cancers.
Conclusions: Our findings suggest that pancreatic neoplasms qualified for resection have similar characteristics regardless of age. The only exception was the count of benign cystic lesions, significantly greater in geriatric cases (p=0.00348). We demonstrated that features of resected cancers are just as unfavorable in the elderly as in younger patients, justifying the decision on surgery.
Keywords: Elderly, Geriatric Surgery, Pancreatic Cancer, Pancreatic Cystic Lesions

Surgery – Case Report

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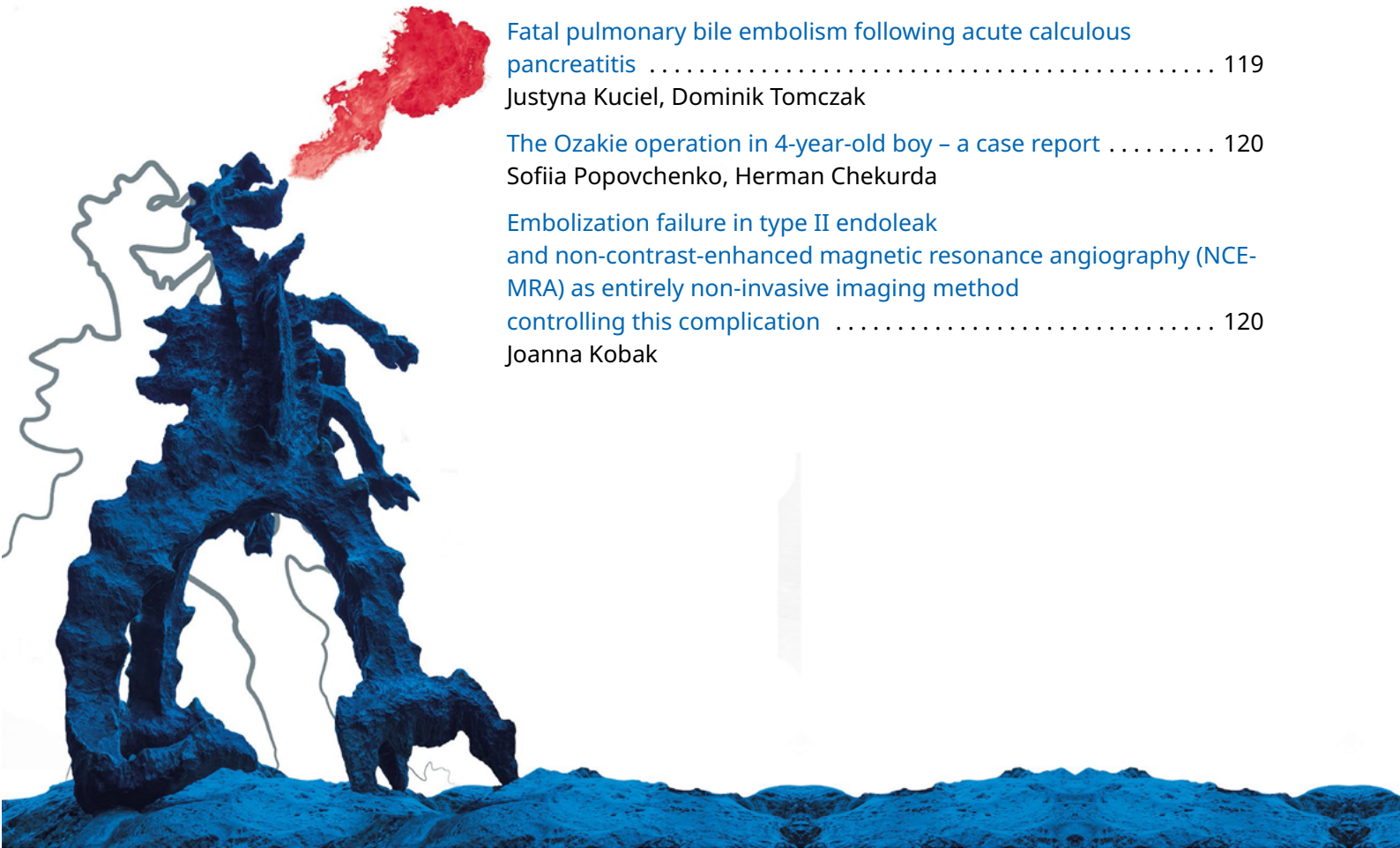
List of papers



Primary malignant melanoma of the duodeno-jejunal flexion – case report

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Trustee: Norbert Nowak, MD

Introduction: Malignant melanoma is often detected in gastrointestinal tract, but primary malignant melanoma of the gastrointestinal tract accounts for only 1.5-2% of all melanomas. These changes are extremely rare and there is a high probability that melanoma of the small intestine, even without a known primary site, is most likely metastatic. Therefore, it is necessary to carry out a very scrupulous diagnostic process. The aim of this work is to present a clinical case and a diagnostic process allowing for the initial confirmation of the diagnosis, which is quite a challenge.
Results: 74-year-old patient with recurrent episodes of gastrointestinal bleeding was admitted to clinical hospital. The patient was directed with CT results, which revealed mass (50 x 25 mm) in duodeno-jejunal flexion. CEA and Ca19.9 markers were negative. Gastroscopy performed in the clinic revealed an advanced neoplastic lesion in duodenum, occupying 3/4 of the circumference. MR confirmed the presence of a solid tumor. Resection of the horizontal part of the duodenum along with fragment of the jejunum was performed and resected specimen was taken for histopathological examination. A side-to-side duodeno-jejunial anastomosis was performed. Histologically lesion exhibited epithelial cells with mild nuclear atypia. The microscopic picture and immunoprofile supported malignant melanoma of the intestine. No primary melanoma in other localization was found in the clinical picture, consequently the change was classified as the primary lesion.
Conclusions: Primary malignant melanoma of duodeno-jejunal flexion is an extremely rare neoplastic lesion of the gastrointestinal tract. Definite diagnosis depends on detailed history, thorough investigation, pathomorphology and immunohistochemical stains. It is very important to exclude the preexistence or coexistence of a primary lesion elsewhere. Early detection and surgical resection are vital to disease survival.
Keywords: primary malignant melanoma, duodeno-jejunal flexion, resection, anastomosis, histopathological examination

38-year-old man with a cholesteatoma of the left ear extending into the cranial cavity

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Introduction: Cholesteatoma is the tumour-like formation in the middle ear or mastoid that is often related to chronic otitis media. Cholesteatoma may cause the destruction of ear ossicles, erosion of the bony labyrinth or canal of the facial nerve. Rarely, it causes more extensive destruction and expands to the cranial cavity. Invasion of the surrounding structures is accelerated by various enzymes, such as collagenase or acid phosphatase. Treatment is based on the surgical procedure.
Results: A 38-year-old man came to the emergency department of the University Hospital in Krakow due to severe headache and fever up to 40 degrees. He gave a history of repeated auricular surgeries. On physical examination, meningeal signs, nystagmus, and impaired consciousness were found. The head CT scan revealed massive inflammatory lesions in the petrous part of the left temporal bone, the infiltration expanded to the middle and posterior cranial fossa and even to the first cervical vertebra. Furthermore, the MRI performed showed involvement of the internal carotid artery and segmental obstruction of the internal carotid vein. The patient received antibiotics for the neuroinfection and surgical treatment was decided. The surgery was extremely extensive and challenging, especially due to the proximity of the left internal carotid artery and the difficult visualization of the operative field, however, the improvement of the local and general condition was achieved. Histopathological examination of the resected tissue revealed the cholesteatoma.
Conclusions: This case is an example of the recurrence cholesteatoma of the mastoid with extension to the posterior and middle cranial fossa with subsequent meningitis. It illustrates how important it is to remember that early diagnosis and treatment of this condition prevent severe complications, including permanent disability and death.
Keywords: cholesteatoma, meningitis, auricular surgery, chronic otitis media, bone erosion

A case report of rare sacral solitary fibrous tumor

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Introduction: Huge primary epidural solitary fibrous tumors in the sacrum are a rare clinical entity. This case report aims to present our experience in treating such large and complex

neoplasm in a 31-year-old female patient. The patient complained of episodic nightly bilateral hip and lower back pain and unilateral radicular symptoms (numbness, paresthesias) in the left S1/S2 dermatomal distribution.
Results: Diagnostic imaging, biopsy, preoperative endovascular embolization, tumor resection, and lumbosacral fusion were performed. The largest size of the entire tumor was 12.0 x 10.0 x 9.3 cm. Tumor masses were separated and removed from the sacrum, dura mater, and sacral roots up to the S1/S3 level with macroscopically clear resection margins. Through posterior partial sacrectomy, intrasacral, extradural and vascular components of the tumor were resected, followed by L4/L5 internal lumboiliac fixation. The sacral bone defect was filled with autograft and bone substitute. The treatment resolved the patient's neurological symptoms and resulted in overall good postoperative functionality. The patient has been in remission for more than four years despite refusing adjuvant radiotherapy due to a desire to maintain her future childbearing potential. During pregnancy, her fetus was diagnosed with subdural hemorrhage on fetal MRI and died after cesarean delivery. The direct cause of pathology remains unknown, but it might be related to prior surgical interventions or perinatal infection in the patient's anamnesis.
Conclusions: Before surgical removal, endovascular tumor embolization should be considered as these tumors are usually hypervascular. We believe that a two-staged piecemeal tumor resection through the combined anterior and posterior approach with preservation of the sacral nerves brings more favorable functional results. Still poorly understood clinical behavior and late relapse of malignancy cases suggest that a long patient follow-up is necessary. Word count: 276
Keywords: hemangiopericytoma, solitary fibrous tumor, sacral tumors, presacral space

Endovascular treatment of the acute dissection of the type B aorta with the Petticoat technique

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Introduction: Acute dissection of aorta is an important health issue, which, besides significant pain suffering, leads to development of some serious complications. It results from the disruption of the inner vascular membrane of aorta and the blood flow to the area of the aortic media. Once the dissection appears, two canals are created in the vessel- proper lumen of the vessel, where the blood flows, and the false lumen occurring between the layers of the aortic wall, where the blood cannot move. Abnormal canal may be increasing and press the aortic ramification ostium. As a result the flow through proper- vessel is limited, and such a condition may be the reason for the ischemia of the organs supplied by the artery.
Results: In this paper we analyze the case of a 61-year-old patient with the diagnosis of the dissection of descending aorta type B. The symptoms included acute chest pain and fits of vomiting. The patient was qualified for the endovascular surgery- the implantation of the stent- graft. Due to the dissection presence in the vicinity to the visceral vessels and the patient's condition increasing the risk of the complications in case of the extensive surgery, it was decided to implement the Petticoat technique treatment. The technique involves the implantation of the stent- graft in the intercostal part of the aorta, which fuels the dissection, and also implantation of the stent in the visceral aortas' ostium to preserve blood supply for the internal organs of the abdominal cavity. In case of the patient discussed, Valiant and Aortic Stents were used. The surgery was successful.
Conclusions: The case of the patient discussed shows that the endovascular surgery was a successful treatment technique leading to regression of the ailments. The application of the stent-graft enabled the closure of the dissection's inlet.
Keywords: endovascular surgeries, dissection of aorta, stent- graft

Fatal pulmonary bile embolism following acute calculous pancreatitis

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Introduction: Pulmonary bile embolism (PBE) is a very rare type of the non-thrombotic pulmonary embolism (NTPE). Other than the present case, there are less than 30 cases published. According to the literature PBE might be associated with ERCP (endoscopic retrograde cholangiopancreatography). For PBE to occur a communication between the venous and bile systems must be formed. This can be caused by trauma or iatrogenically. The pressure in the bile ducts must be higher than the venous pressure.
Results: We present a case of a 27-year-old woman admitted to the hospital because of pain in the upper right quadrant of the abdomen and jaundice. Four days prior admission, the patient reported an episode of vomiting and discolored stool. Laboratory tests on admission showed: elevated levels of GGTP, ALP, amylase, lipase, and CRP. In physical examination, yellowing of the conjunctiva and pain under the right costal arch were noticed. Pantoprazole, ibuprofen and buscolisinum were administered. Abdominal ultrasonography revealed many small concrements in the gallbladder, widened choledocus (12 mm), nonhomogeneous pancreas and small amount of fluid in the Morison's pouch which suggested calculous pancreatitis. ERCP with papillotomy and removal of gallstones was performed. After administering contrast many concrements were noted. During the procedure the patient's vital signs deteriorated rapidly and patient suffered sudden cardiac arrest. After 20-minute-long resuscitation

death was declared. The autopsy identified pulmonary bile embolism and DIC (disseminated intravascular coagulation) secondary to acute necrotizing pancreatitis as cause of death.
Conclusions: PBE is hard to distinguish from other NTPE. In presented case the PBE occurred due to increased bile tracts pressure caused by cholestasis. This combined with the sepsis caused by necrotizing pancreatitis lead to patient's death. PBE should be included in differential diagnosis as a cause of death in cases of hepatobiliary or pancreatic diseases.
Keywords: pulmonary bile embolism, acute calculous pancreatitis, ERCP, surgery

The Ozakie operation in 4-year-old boy – a case report

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Trustee: Tomasz Moroczek, Associate Professor, MD, PhD

Introduction: The Ozaki technique is an innovative surgery to replace the diseased aortic valve using tissue from the pericardium. Valvular operations in children and young patients always represent a huge challenge: anatomy (small dimensions, complex and multiple lesions), limited options (poor results with bioprostheses, few and difficult alternatives / Ross procedure), anticoagulation (young age, activity, long term risks).
Results: In this case report we highlight the case of a 4-year old boy with congenital aortic valve stenosis, coexisting aortic valve insufficiency, MI, TVI and fibroelastosis of left ventricle. Maximal gradient was 90 mmHg. The patient went through Valvuloplasty and Comisurotomy. Aortic root was 15mm. The patient was undergoing the Ozakie procedure for aortic valve reconstruction using tissue-engineered bovine pericardium as the leaflet substitute.
Conclusions: Full replacement of the aortic valve with biomaterials is now possible with improved understanding of required leaflet geometry and better implant techniques. Using autograft in comparing with mechanical or artificial valves makes it possible to reduce reoperation rate, some long-term complications resulting from shorter anticoagulation treatment. It gives an opportunity for successful treatment for patients which couldn't have ordinary valve replacement.
Keywords: Ozakie operation, AVS, Autograft, congenital AV disease

Embolization failure in type II endoleak and non-contrast-enhanced magnetic resonance angiography (NCE-MRA) as entirely non-invasive imaging method controlling this complication

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Trustee: Prof. Radosław Pietura, MD, PhD

Introduction: Endovascular aortic aneurysm repair (EVAR) states currently widely used technique for the abdominal aortic aneurysm (AAA) treatment; however, complications as endoleak may occur, which require further interventions, like embolization, that preclude blood flow into aneurysmal sac. After embolization imaging follow-up is needed. Currently, the preferred imaging modalities remain computed tomography angiography (CTA), Doppler ultrasound or contrast-enhanced MRA; however, CTA is associated with exposition to ionizing radiation and contrast agents, which may lead to thyrotoxicosis, renal injury or allergic reactions. Ultrasound may be limited by operator experience and difficulties in reproducibility. Regarding contrast-enhanced MRA, gadolinium deposition in the brain tissue were recently described. Hence, as a novel, completely non-invasive imaging method appears NCE-MRA.
Results: Case report concerns about a 83-year-old female patient who in January 2022 was admitted to the hospital due to enlargement of AAA sac after EVAR that was performed in 2015. Digital subtraction angiography revealed type II endoleak that was perfused through left and right internal iliac artery. The embolization attempts with placement of the catheter tip in the aneurysm sac and administration embolic agents were unsuccessful due to significant tortuosity and presence of atherosclerotic plaques in the feeder iliolumbar branches. Then, the decision was made to embolize the right feeder artery and communicating vessel with left feeder artery using cyanoacrylate glue that resulted in loss of patency of the feeder vessels. Subsequent NCE-MRA revealed, however, a site of low signal intensity, accounting for about 20% of the area of aneurysmal sac, corresponding fresh thrombus and indicating residual endoleak. The decision was made to repeat NCE-MRA in 14 days and possibly re-embolize endoleak.
Conclusions: Type II endoleak embolization may be exceedingly challenging due to unpredictable feeder vessel anatomy or the presence of obstructions and constrictions. NCE-MRA allows for a precise evaluation of the content and size of the aneurysmal sac.
Keywords: abdominal aortic aneurysm, magnetic resonance imaging, stent-graft, aneurysmal sac, interventional radiology