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O001 Myocardial infarction without coronary artery obstruction (MINOCA)

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MINOCA is a clinical syndrome that involves a heterogeneous group of patients who have myocardial infarct but do not have significant coronary artery obstruction on an angiogram. MINOCA is a working diagnosis with various pathophysiological mechanisms responsible for the acute manifestation of the disease. Determining the root causes is necessary for the correct choice of treatment. Rational therapy derives from an etiological diagnosis, a therapy that may be suitable for a single cause (e.g. anticoagulant for thromboembolism or calcium channel blockers for vasospasm) will not be suitable for all MINOCA patients.
Myocardial infarction without coronary artery obstruction (MINOCA) is actually a heterogeneous clinical entity characterized by the absence of obstructive coronary artery disease (≥50% stenosis) and an obvious cause for acute presentation at the time of angiography. The prevalence of MINOCA ranges from 1% to 14% in patients diagnosed with AMI. It is more common in women as well as in patients presented as myocardial infarction without ST-segment elevation (NSTEMI). Although it depends on the cause, the prognosis of MINOCA is serious, with a one-year mortality rate of about 3.5%. Pathophysiological mechanisms of MINOCA, can be 1. coronary : vasospatic angina, coronary mirovascular dysfunction, rupture / erosclerotic plaque, spontaneous coronary thrombosis or embolism, overlooked obstructive CVD. 2. Non-coronary : cardiac(myocarditis, Tacotsubo cardiomyopathy, other cardiomyopathy) or non-cardiac patients (pulmonary embolism , renal failure, sepsis, stroke).
According to the Guidelines of the European Society of Cardiology (ESC), diagnostic criteria for myocardial infarction without coronary artery obstruction include: (1) the universal criterion for the diagnosis of acute myocardial infarction, (2) the absence of coronary artery obstruction on angiography defined as the absence of stenosis ≥ 50% in any possible infarction artery (IRA), and (3) the absence of a clear clinical cause for acute presentation.
MINOCA is a working diagnosis that is made at the end of coronary angiography in patients with AMI. In the absence of obstructive CAD (<50% luminal obstruction), additional diagnostics are required to identify the root cause.
Therapy according to the American Heart Association (AHA) care of MINOCA patients includes: emergency care, careful diagnostic evaluation of the underlying cause, cardioprotective therapy and targeted therapy against the cause. A number of MINOCA patients require emergency therapy for life-threatening arrhythmias or cardiogenic shock. Although revascularization is a cornerstone of therapy for AMI-CAD, it is not a therapeutic option in patients with MINOCA .

O002 Aortic stenosis - the optimal time and method of treatment

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Aortic stenosis is the most common valve disease and the third most common cardiovascular disease . A long period of time can be asymptomatic which speaks in favor of the gradual development of the pathological process . The onset of symptoms speaks in favor of advanced changes and the need for replacement of the aortic valve. In addition to clinical examination, echocardiography is a diagnostic "cornerstone" for diagnosing the disease and determining the degree of aortic stenosis. In modern diagnostic and therapeutic protocols, the role of multi-slice diagnostic computed tomography occupies an increasing space in the diagnostic phase, but also in the preparation for optimal surgical treatment. The mandatory diagnostic algorithm includes various laboratory tests as well as interventional cardiac testing.
Basically, treatment involves replacing the aortic valve. Different medical and non-invasive treatments are at different stages of research. Replacement of the aortic valve can be surgically performed with biological and mechanical prosthesis or percutaneous invasive intervention (TAVI).
The aim of the presentation is to present diagnostic and therapeutic algorithms in the treatment of aortic stenosis with a focus on the need for maximum interaction of cardiac and cardiac surgical teams in order to timely and optimal treatment, adequate preoperative preparation and quality postoperative monitoring of patients.

O003 Development of LVAD program from "bridge to transplant" to "alternative" heart transplantation

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Left ventricular devices, or LVAD, have evolved from a temporary therapeutic measure to a long-term solution to support cardiac function.
While the number of people eligible for a heart transplant has increased, the number of donors has remained the same. For many years, LVAD devices have offered these patients the opportunity to bridge the period to heart transplantation and a better quality of life. Over time, LVAD technology has improved, state-of-the-art mechanical devices have evolved from "bridge to transplant" to a long-term therapeutic solution.
LVAD replaces the work of the left ventricle, and essentially functions as a partial artificial heart.
Studies have shown that LVAD in selected patients with advanced heart failure can improve longevity and quality of life compared to medication treatment. In some cases,

patients may, with certain adaptations of lifestyle habits, return to work and hobbies that they previously could not enjoy due to advanced symptoms of heart failure. LVAD also has limitations that affect the therapeutic effectiveness primarily infection, bleeding and cerebrovascular complications.
The aim of the presentation is to present the results and experiences of the Clinic for Cardiac Surgery UKCS within this program, as well as to present reports of the most current studies related to the effectiveness of the LVAD program.

O004 Electrocardiographic changes in acute coronary syndrome with or without ST elevation

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Electrocardiographic (ECG) changes with an appropriate clinical symptoms and levels of cardiospecific enzymes (troponin T and/or I) play a key role in the detection of acute forms of ischemic heart disease. The highest sensitivity and specificity for the detection of myocardial ischemia on the ECG have dynamic changes of ST-segment and T-waves, followed by changes in the Q-wave. Acute myocardial infarction with ST-segment elevation (STEMI) is characterized by a newly formed ST-segment elevation that is slightly convex upwards with an elevated J point in at least two adjacent ECG leads, and which is ≥1.0 mm in all leads except in leads V2-V3 where ST-segment elevation is required to be ≥2.0 mm in men older than 40 years, or ≥2.5 mm in men younger than 40 years, or ≥1.5 mm in women. Conversely, unstable angina (UA) and acute myocardial infarction without ST-segment elevation (NSTEMI) is characterized by a deep, symmetrically negative T-waves (coronary, ischemic T-waves >1.0 mm) and/or ST-segment depression >0.5-1.0 mm in at least two adjacent ECG leads which present ECG signs of subendocardial ischemia. However, studies have demonstrated that acute coronary syndrome (ACS) does not always produce the classic dynamic changes of ST-segment and T-waves in contiguous leads. In fact, these studies have suggested that 25% to 38% of patients with ACS will not demonstrate expected ST-segment and/or T-waves changes. These patients are so-called "STEMI equivalents" and are often deprived of the opportunity for immediate reperfusion therapy, resulting in potentially greater cardiac morbidity and mortality. The recently published ACC Consensus document provide recommendations addressing the evaluation and management of patients presenting to the emergency department with chest pain. They reaffirmed the importance of identifying posterior STEMI, patients with left bundle branch block patterns or right ventricular pacemakers who manifest Sgarbossa criteria or modified Sgarbossa criteria, and patients with de Winter sign.

O005 Novelties in the approach to the patients with antiplatelet drugs induced bleeding

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New generation antiplatelet drugs are often used as part of dual or triple antiplatelet therapy i.e. in multimodal antithrombotic regimens, definitely reduce ischemic risk, but may also lead to an increased incidence of significant hemorrhagic events.
Timely assessment of ischemic thromboembolic risk and the possibility of bleeding in certain stages of treatment represents the best prevention of hemorrhagic complications. After determining the general and local patient-specific factors for bleeding, the reduction of the number of antithrombotic drugs and the duration of administration of certain antiplatelet drugs should be considered.
In patients with acute coronary syndrome and risk of bleeding, before implantation of percutaneous coronary intervention, it is necessary to consider the procedure (balloon angioplasty or stent implantation) that requires the shortest period of dual antiplatelet therapy adapted to the specific patient.
When significant bleeding with potentially life-threatening complications occurs in a patient on antiplatelet therapy, the modern therapeutic approach involves the application of new drugs, measures and procedures such as usage of novel systemic treatments for the reversal of antiplatelet effects among which we particularly emphasize the application of bentracimab as ticagrelor antidote, or use of hemadsorption for plasma drug removal, as well as the local hemostatic measures including endovascular methods.
Certain rules are determined in the application of platelet transfusions in view of the fact that platelet transfusion is generally considered to be more useful in acute reversal of antiplatelet effect of aspirin, clopidogrel and partially for prasugrel. In the case of platelet transfusions in patients treated with ticagrelor, the situation is more complicated, time-dependent effect of platelet transfusion on ticagrelor reversal might be more pronounced and the effect of platelet transfusions is unproven, especially in the period of active hemorrhage. Reasons for this different response to platelet transfusion might be found in fact that ticagrelor and its active metabolite have an elimination half-life of 7-8.5 hours, and a very high percentage of albumin binding (more than 99%), which represents significant ticagrelor pool in the circulation. Due to the above pharmacokinetic parameters, it

is considered that platelet transfusions can have a significant effect only after 24-48 h from the moment of last ticagrelor administration.
A good clinical outcome requires special attention to the collection of anamnestic and other clinical data on the existence of hemorrhagic risk during the first contact with the patient, as well as an appropriate multidisciplinary approach to the performance of the revascularization procedure itself and the definition of the most adequate protocol for the management of bleeding if it occurs.

O006 Atrial fibrilattion- what's hidden behind the curtain?

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In the pre-Fontan era, the anatomical substrate of congenital univentricular heart defect was incompatible with long-term life. Extraordinary success of the of Fontan's single-chamber heart surgery pioneers, beside prolonged survival left a legacy of the overlooked burden of postoperative morbidity of these patients as well.
We present a rare case of an adult patient after Fontan's palliation, illustrative of how the complex clinical course of an univentricular physiology combined with broad spectrum of its treatment complications can be encountered at the end of the one of today's most common arrhythmias.
This case exhibits heterogeneous etiological and therapeutic challenges Critical Care Units deals with on a daily basis, highlighting the need of a multidisciplinary and individual approach in clinical care of of all patients admitted.

O007 Cardiac magnetic resonance in the evaluation of target organ damage in patients with hypertensive crisis hospitalized in coronary care unit

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Hypertension is one of the most important cardiovascular risk factors, associated with significant morbidity and mortality. Chronic high blood pressure leads to various structural and functional changes in the myocardium. Different sophisticated imaging methods are developed to properly estimate the severity of the disease and to prevent target organ damage. Cardiac magnetic resonance can provide a comprehensive assessment of patients with hypertensive heart disease, including accurate and reproducible measurement of left and right ventricle volumes and function, tissue characterization, and scar quantification. It is important in the proper evaluation of different left ventricle hypertrophy patterns to estimate the presence and severity of myocardial fibrosis, as well as to give more information about the benefits of different therapeutic modalities. Hypertensive heart disease often manifests as a subclinical condition, giving exceptional value to cardiac magnetic resonance as an imaging modality capable to detect subtle changes. In this article, we are giving a comprehensive review of all the possibilities of cardiac magnetic resonance in patients with hypertensive heart disease.

O008 Alcoholic heart and liver disease - the beginning or end

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Alcoholic cardiomyopathy is one of the leading causes of non-ischemic dilated cardiomyopathy, with incidence of 1-2% of all heavy alcohol users and up to 30% of all non-ischemic cardiomyopathies.
Alcoholic liver disease – hepatitis and cirrhosis, has significant impact on cardiovascular system and hemodynamics, as a combination of different pathophysiological mechanisms and is a risk factor for the manifestation of cardiomyopathy, especially in states of acute stress, most often infection.
Patient V.P, 43 years old, was hospitalized due to suspected pulmonary thromboembolism, with clinical presentation of shock with multi organ failure. He had no previous chronic diseases, with history of prolonged alcohol abuse and excessive smoking. Laboratory analyses showed signs of renal damage, hepatolysis, cardiomyocyte necrosis, heart failure, abnormal coagulation status, elevated D-dimer and markers of inflammation, thrombocytopenia, normal thyroid status, negative virological analyses. Pleural effusions were described on chest X-ray, echosonography showed ascites, inhomogeneous, hyperechoic liver. No signs of acute surgical disease were found. Symptomatic and antibiotic therapy was introduced, along with reduced dose of fondaparinux. As a result, recovery of kidney function was registered, with laboratory decrease in values of nitrogenous metabolites and markers of inflammation, hepatic and cardiac damage. Echocardiography showed dilated heart chambers, left ventricle with significantly reduced systolic function (EF about 25%), extensive areas of akinesia, including the apex, with two thrombi of moderate embolic potential, right ventricle with reduced contractility. CT pulmonary angiography described signs of embolization of segmental and subsegmental branches to the lower lobes bilaterally. Golden staphylococcus was isolated by blood culture. On the seventh day of hospitalization, due to sudden worsening of respiratory insufficiency, invasive mechanical ventilation was started and subsequently, pleural puncture of right sided pleural effusion was performed with evacuation of clear, serous fluid.
Finally, clinical presentation was understood as alcoholic hepatitis and decompensated alcoholic cardiomyopathy, with development of acute hepatic and renal failure, coagulation disorder and disseminated thrombosis, precipitated by the state of systemic infection.

In case of prolonged and even shorter lasting excessive alcohol intake, disastrous systemic effects of liver damage, associated with heart failure, can be long-term or even fatal, in previously apparently healthy individuals.

O009 Systemic Infection and Myocardial Infarction

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Sepsis is a clinical syndrome primarily characterized by a severe infection. It is marked by a systemic inflammatory response and a high frequency of multiorgan failure, including myocardial damage due to the activation of pro-inflammatory and prothrombotic mechanisms. The basis of acute myocardial infarction is ischemia caused by acute coronary obstruction associated with the interference of an atherosclerotic plaque and resulting thrombosis. These plaques contain inflammatory cells, which can be activated by infections in other parts of the body, especially in the context of septic conditions. Inflammatory cytokines are produced during these conditions, which, along with a prothrombotic and procoagulant state linked to acute infection, also increase the risk of coronary thrombosis at plaque-damaged sites. In Type 2 infarction, the metabolic demands of myocardial cells exceed the blood's capacity to supply them with oxygen, a condition known as demand ischemia, particularly pronounced in the context of septic conditions. The goal of our case presentation is to highlight the possibility of acute coronary syndrome (ACS) occurring in the context of sepsis, which requires a multidisciplinary approach to the treatment of these patients.

O010 Allergic heart attack - can it surprise us?

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Kounis syndrome is defined as a set of cardiovascular symptoms that occur as a result of an allergic reaction and presents as acute coronary syndrome. The mechanism of Kounis syndrome is based on the release of inflammatory cytokines through the activation of mast cells, which results in vasospasm of the coronary artery and/or erosion or rupture of the atherosclerotic plaque. Kounis syndrome was previously thought to be a rare clinical entity but is now increasingly being identified as a cause of acute coronary events, particularly in patients without a prior history of coronary artery disease. The largest number of diagnosed cases of Kounis syndrome are induced by medication, most often in men aged between 40 and 70 years. The goal of our case presentation is to point out that Kounis syndrome is not rare and that, although it is rarely recognized and diagnosed, the so-called "allergic myocardial infarction" should not surprise us, and it is very important for the patient to identify the allergens that led to the activation of the pathophysiological mechanisms of this syndrome.

O011 Valve tumor – do we have control?

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Primary heart tumors are very rare, the incidence is less than 0.1%. Most are benign in their character, and the most common are myxomas and papillary fibroelastomas. The first case of papillary fibroelastoma was described in 1975 in patients with myocardial infarction. The precise etiopathogenesis is still not completely clear, but this tumor is thought to have originated in the valvular endocardium and occurs in places of endocardial damage. Papillary fibroelastomas are most often asymptomatic and are detected accidentally on echocardiographic examinations. However, in certain patients, the first manifestation is vascular embolic events. Definitive treatment is surgical excision and possibly valve reconstruction, and the question of the moment of intervention is individual and depends on the size of the tumor, the simultaneous existence valvular damage and general condition of the patient. Here is an illustrative case of a 44-year-old patient with papillary fibroelastoma of bicuspid aortic valve who presented himself with acute myocardial infarction without coronary artery obstruction and acute ischemic stroke, in addition to spleen infarction.

O012 Echocardiography in the diagnosis of AMI: the sooner the better

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Echocardiography (ECHO) is a very useful tool in assessing the patients with chest pain. In acute myocardial infarction (AMI), ECHO has multiple roles, of which early establishing the diagnosis is most important, as well as determing AMI location and extent. Biochemical changes in acute ischemia cause primarily abnormalities in diastolic, and then in systolic function. Wall motion abnormalities are pathognomic of acute ischemia and occur before electrocardiographic (ECG) and specific biomarkers changes. That's the reason why ECHO can help to make a diagnosis of AMI, even in patients with atypical clinical presentation, inconclusive ECG or with normal or slightly elevated cardiospecific enzymes. Lately, myocardial contrast agents may contribute to better identification of regions with contractile abnormalities in patients with poor ECHO visualization and to some degree to myocardial perfusion assessment. Detection of ischemic complications and determining the prognosis are additional benefits of ECHO in patients with AMI. Echocardiography should also serve to exclude nonischemic causes of cardiac chest pain in

conditions that can mimic AMI and sometime require very urgent, but different therapy.
Echocardiography (ECHO) is indispensable part of AMI diagnostic puzzle.

O013 Nuclear medicine procedures in evaluation of coronary stenosis

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Coronary stenosis can be evaluated with different noninvasive procedures. One of them are nuclear medicine procedures.
Conventional nuclear medicine includes myocardial perfusion stress test and viability tests, which have long history of use worldvide. The use of 201Tl was abandoned due to the high doses of radiation that were applied. Nowadays, isonitriles bounded to 99mTc are the most frequently used radiopharmaceuticals for those purposes. Using the SPECT imaging technique, these procedures determine functional parameters: ejection fraction, end diastolic volume, end systolic volume (EF, EDV; ESV) with high sensitivity and specificity. They also enable the quantification of perfusion, wall motion and left ventricular wall thickening. Software packages give us options for calculating the percentage of ischemia and scarring, as well as differentiation based on which blood vessel the ischemia occurred.The existence of quantification reduces the inter-observer error and contributes significantly to the objectivity of the examination.
A new era in nuclear medicine is the emergence of hybrid devices: single photon emission tomography with computed tomography (SPECT/CT) and positron emission tomography with computed tomography (PET/CT). They use usually radiopharmaceuticals such as 15O, 13N, 18F or 82Rb. These procedures increase the sensitivity of previous examinations and enable new functions, such as assessment of calcium score, quantification of coronary flow.These procedures are fast, reliable,non-invasive, have prognostic impact and involve a small amount of radiation dose, so they can be used without fear to patients of all age groups.

O014 The usage of noninvasive cardiovascular imaging in acute chest pain-judgment of the clinician

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There are three main roles of cardiac magnetic resonance (CMR) in acute coronary syndrome (ACS) in daily clinical practice. The first role of CMR is making the right and timely diagnosis; the second role is its prognostic importance in assessing the patients risk: the third role is visualization of complications and assessment of their severity.
CMR is important in assessing the anatomy, function and tissue characteristics of the myocardium in ACS. Global and regional left ventricular (LV) function, right ventricular function, myocardial infarction (MI)/scar size, microvascular obstruction (MVO), intramyocardial haemorrhage (IMH), myocardial perfusion, viability are dilemmas that can be resolved using CMR in different stages of the disease in patients with ACS.
A special challenge is to find the etiopathogenetic process when the working diagnosis myocardial infarction without coronary artery obstruction (MINOCA) is made. CMR is very often a crucial diagnostic method in these patients. The differential diagnosis of patients with ischemic versus non-ischemic cardiac diseases, including non-ischemic cardiomyopathies, myocarditis, but also other non-cardiological diseases is possible using advanced techniques such as T1 and T2 mapping which can analyze and quantify even diffuse changes in the tissue of the myocardium.
The advantage of CMR over other diagnostic methods is its high sensitivity and specificity. It is ofparticular importance in the case of a bad echocardiographic window when the echocardiographic findings are inconclusive. The fact that there is no application of ionizing radiation in CMR is also important. The disadvantages of this method are less availability, especially for immobile patients, and the duration of examination.

O015 The significance of high sensitive troponin in systemic diseases/conditions

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Determination of troponin I and/or T is the most frequently used biochemical analysis in cardiology, especially in the emergency departments. Elevated troponin values are markers of myocardial injury. troponin is the major criterion for the diagnosis of acute myocardial infarction, but for the diagnosis of AMI, at least one more criterion must be present - chest pain and/or ECG changes, and/or echocardiographic findings, and/or angiographic findings. Many systemic conditions can cause acute myocardial injury. Clinical interpretation of elevated troponin values can be complicated sometimes and, as a rule, requires an overall patient assessment. Troponins are organ (myocardial) specific, but not "disease specific". Some patients with chronic systemic conditions such as sepsis, chronic kidney disease, skeletal myopathies, etc. have elevated troponin levels as a consequence of acute myocardial injury that may be reversible or irreversible. In these patients it is important not to miss the diagnosis of acute myocardial infarction, because specific treatment (e.g. PCI, dual antiplatelet therapy, etc) improved the prognosis in these patients. On the other hand, patients with systemic conditions who have an increased troponin value, have a higher mortality rate as compared with

patients with the same condition, but with normal troponin level.
Conclusion: Troponins are very important and complex biomarkers of myocardial injury. Their elevated level should be properly interpreted. Patients with chronic non-cardiac conditions who have elevated troponin level as a rule have poorer prognosis than patients with the same condition, but with normal troponin level.

O016 The role of cardiac magnetic resonance imaging in patients with acute chest pain

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Chest pain is one of the commonest indications for acute hospital admission. Patients with chest pain have a lot of investigations including electrocardiography (ECG) and cardiac biomarkers as part of risk stratification. It may represent myocardial infarction, but other diagnosis such as acute myocarditis or Takotsubo cardiomyopathy are also possible.
Cardiac magnetic resonance (CMR) is the only non-invasive diagnostic method that can differentiate those conditions. The development of late gadolinium enhancement (LGE) provides CMR to be a sensitive and specific tool for detection of even small amounts of myocardial damage. Using standard and advanced CMR protocols we can estimate anatomical structure of heart and functions of both ventricles as well as myocardial tissue. The vast majority of patients presenting with cardiac chest pain, no evidence of ST elevation on their ECG and with elevated troponin concentration are diagnosed as having NSTEMI.
On CMR focal LGE in a subendocardial distribution of a coronary artery territory is a characteristic of myocardial infarction. Patchy LGE consistent with myocarditis and usually have subepicardial or mesomyocardial distribution. On native T2 weighted imaging with fat suppression we are able to provide evidence of inflammation/oedema without late enhancement. More sensitive for detecting oedema and diffuse fibrosis are new multiparametric sequences such as T1 and T2 mapping.
As it is known elevation of cardiac-specific troponin in serum is highly sensitive and specific for myocardial injury, but alone may not directly provide information on the mechanism of myocardial injury, which may be critically important to clinical management. So that is the reason we need CMR as a gold standard for tissue characterisation and very helpful tool for accurate diagnosis. Besides differentiating ischemic of non-ischemic damage CMR is the only method to detect microvascular opstruction (MVO) as a linear subendocardial hipointensity line which is connected with ischemic damage.

O017 The Importance of Cardiac Magnetic Resonance Imaging in MINOCA patients

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MINOCA stands for Myocardial Infarction with Non Obstructive Coronary Arteries. Prevalence of MINOCA is between 2–10% and it is more common among women who have presented with acute ST-elevation myocardial infarction (STEMI) and have undergone coronary angiography with no evidence of obstructive disease which is defined by less than 50% stenosis. Before, MINOCA was considered as a benign phenomenon, later has been proven to carry with it significant morbidity and mortality when compared to the general population. Cardiac magnetic resonance (CMR) has shown to be an essential first step in the diagnosis of patients with suspected MINOCA. CMR has a crucial role in differentiating the etiology of acute coronary syndrome (ACS). Imaging characteristics are used in clinical practice to discriminate etiologies of myocardial damage which may have similar presentations. Acute myocardial infarction, Takotsubo syndrome, myocarditis and MINOCA all have some overlap regarding clinical symptoms as well as laboratory analysis.
According to new meta-analysis of studies using CMR as a diagnostic tool in patients presenting as MINOCA, myocarditis was found to be the leading diagnosis even in 38% of cases. Other causes included Takotsubo cardiomyopathy, acute MI, and hypertrophic or dilated cardiomyopathy. After exclusion of non-ischemic causes, the possible mechanisms for MINOCA can be rupture of atherosclerotic plaque, coronary thrombosis and emboli, microvascular disease, coronary spasm, and spontaneous coronary artery dissection (SCAD). CMR was shown to be an important diagnostic tool for assessing the etiology of patients presenting with troponin elevation and myocardial injury.
New data demonstrated the significance of early CMR, within 14 days from presentation, in ensuring rapid and accurate diagnosis, which is crucial to ensure adequate treatment and follow-up to improve overall outcomes in those patients. CMR has a unique capability to accurately assess both ischemic and non-ischemic etiologies for myocardial injury.

O018 The role of CT coronary angiography in the clinical evaluation of suspected ischemic heart disease

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The evaluation of coronary artery disease (CAD) using coronary computed tomography angiography (CCTA) has undergone a paradigm shift in the last decade. There is increasing evidence to support the clinical application of CCTA

in various stages of CAD, from the detection of early subclinical disease to the evaluation of acute chest pain. New applications of CCTA based on hemodynamic indices and plaque characterization may provide personalized risk assessment, influence disease detection and further therapy.
To determine the role of CCTA in diagnosing suspected CAD, directing appropriate therapy, and predicting future cardiac events.
Determination of calcium score (CACS) values are correlated with the severity and extent of obstructive CAD. CCTA provides information about the vessel wall, atherosclerotic plaque composition, and presence of surrounding epicardial fat, allowing identification of high-risk plaque and perivascular fat attenuation index (FAI). Computational fluid dynamics applied to CCTA allows virtual calculation of FFR without the need for additional imaging and administration of vasodilators. CCTA can define highly vulnerable plaques by observing positive remodeling, punctate calcifications, low plaque attenuation, and the napkin-ring sign. CT-FFR values can be calculated in blood vessels with a diameter ≥1.8 mm, they are negative >0.80 and positive if at least one value is ≤0.80. Patients with one or more values ≤0.80, which are 2 to 3 cm distal to the focal stenosis, define a specific ischemic lesion.
CCTA is a first-line diagnostic modality for CAD with a strong basis in histopathology and a high negative predictive value. New technologies enabling radiation dose reduction, better detection of plaque features, and computational fluid dynamics increase the prognostic value of CCTA and further integrate CCTA into clinical practice.

O019 Atypical presentation of the acute coronary syndrome patient – eastern Serbia STEMI network

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The aim of this paper is to present a patient with acute coronary syndrome and coronary artery occlusion followed by an atypical ECG presentation. CASE PRESENTATION: The patient was hospitalized in the Internal department of the Health Center Negotin due to typical chest pain that occurred on the day of admission. There were NO dynamic electrocardiographic changes. Due to the characteric nature of chest pain, despite the absence of ECG changes, the patient was admited and therapy for acute coronary syndrome administered. High sensitive troponin value of 5294 pg/ml was obtained. After receiving a positive troponin, the patient was referred to the Department of Invasive Cardiology in Zajecar for coronary angiography. The findings of coronary angiography indicated ostial occlusion by RCA thrombus, as well as an anomaly of Cx originating from the right coronary sinus. There were no angiographically significant stenoses in the other arteries. Due to the anomalous anatomical origin of the Cx from the right coronary ostium and a different course of the artery, despite the occlusion of the RCA, there were no ECG changes. A primary percutaneous coronary intervention was performed on the RCA.
CONCLUSION: In patients with a typical clinical features of acute coronary syndrome even in the absence of characteristic electrocardiographic changes, the further diagnostic algorithm should be based on troponin findings in all and echocardiography in selected cases. In this way, we enable adequate diagnosis and therapy in vast majority of patients.

O020 The patient with electrical storm – diagnostic and therapeutic dilemmas

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AIM of this paper is a case report of a patient with electrical storm after an ICD implantation precipitated by decompensated heart failure. CASE PRESENTATION: We present a 48-year-old patient with an implanted cardioverter defibillator in the secondary prevention of sudden cardiac death and the occurrence of an electrical storm in the form of polymorphic ventricular tachycardia with degeneration into ventricular fibrilation treated by the delivery of 10 intracardiac DC shocks in a several hours period. A multimodality approach to the patient was applied, which included the initial search for precipitating factors, electronic interrogation and changes in device programming, antiarrhythmic drug therapy and patient sedation. The applied measures are discussed in the context of the available literature. A multimodality approach to patients with electrical storm in specialized centers improves outcomes of such complex patients. electrical storm, inplantable cardiac defibrilator, multimodality imaging. CONCLUSIONS: Electrical storm is the most dramatic clinical event in patients with an implanted cardioverter defibrillator that requires adequate diagnostics and multimodality approach in specialized centers with appropriate equipment and personnel. This approach improves the outcome of such complex patients.

O021 The patient with torsades de pointes and bradyarrythmia – diagnostic and therapeutic dilemmas

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The AIM of this paper is to describe a patient with bradyarrhythmia complicated by the appearance of ventricular tachycardia of the Torsade de pointes type. CASE PRESENTATION: After the preliminary and normal clinical findings, hospitalization was proposed, which the patient refused. A Holter ECG was performed before discharge. Immediately after leaving the Internal medicine department, a repeated loss of consciousness occured. On the Holter ECG, ventricular tachycardia of Torsade de pointes type was seen and AV block grade II, therefore the implantation of a DDDR pacemaker was indicated. After the implantation of the pacemaker, the patient's condition remained stable, without repeated crises of consciousness. On electronic pacemaker

controls, there were no significant disturbances in excitability and conduction. CONCLUSION: Torsade de pointes ventricular tachycardia is rare and usually associated with prolonged QT interval and bradyarrhythmias. Implantation of a permanent anti-bradycardic pacemaker can be a definitive therapeutic solution.

O022 High risk pulmonary tromboembolism – diagnostic and therapeutic approach

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The AIM of this paper is to present a patient with typical electrocardiographic and echocardiographic findings stratified as high - risk pulmonary tromboembolism who was treated with systemic fibrinolytic therapy. CASE PRESENTATION: A 70-year-old patient was admitted to the Intensive Care Unit of the Department of internal medicine of the the Zajecar Health Center. On admisson he was hypotensive, dyspnoeic, with signs of organ hypoperfusion. Electrocardiographically, the S1Q3T3 sign and right bundle branch block (RBBB) are verified and a high-risk PTE is suspected. The transthoracic echocardiography revealed a large thrombus that prolapses from the right atrium to the right ventricle. Systemic fibrinolytic therapy with alteplase with concomitant unfractionated heparin was administered. Hemodynamic stabilization of patient, loss of electrocardiographic changes suggestive of PTE and complete thrombus resolution in the right heart cavities occured. The patient was discharged home after 12 days of hospital treatment. CONCLUSION: Early risk stratification of patients with PTE and development of a local protocol for diagnosis and treatment according to the risk class increases the success rate in recognizing and treating this disease and reduces the risk of death and other adverse clinical events.

O023 Effect of exercise training in cardiopulmonary rehabilitation patients suffering acute myocardial infarction

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Aim:To evaluate effect of short-term exercise training on cardiopulmonary exercise testing (CPET) parameters in patients suffering acute myocardial infarction (MI) treated with percutaneous coronary intervention (PCI) or Coronary Bypass Grafting (CABG)
Methods: We studied 124 consecutive patients with MI, 70 treated with PCI (age 51,90±8,60 years, left ventricular ejection fraction LVEF 53,80±7,20%) and 54 treated with CABG (age 57,70±7,60 years, LVEF 51,44±8,40%.) reffered for rehabilitation to our institution. Patients with associated chronic obstructive pulmonary disease (COPD) were 32. The study population consisted of 112 men and 12 women, who participated in 3-week clinical cardiopulmonary rehabilitation program. The program consisted of cycling for 7 times/week, and daily walking for 45 min at intensity of 60-80% of the individual maximal heart rate assessed by CPET. All patients performed symptom-limited CPET on a bicycle ergometer with a ramp protocol of 10w/min. The CPET also performed after cardiac rehabilitation programs and 6-months period of follow up.
Results: After 3 weeks of exercise-based cardiac rehabilitation program improved exercise tolerance as compared to baseline in patients with PCI (peak workload 104,27±19,77 vs 119,07±20,53 watts, respectively, $p < 0,01$), as well as in patients with CABG (peak workload 97,40±18,94 vs 109,52±24,31, watts, respectively, $p < 0,05$), peak respiratory exchage ratio (RER) were also improved in patients with PCI (1,04±0,09 vs 1,09±0,13, respectively, $p < 0,01$) as well as in patients with CABG (1,07±0,12 vs 1,12±0,1; respectively, $p < 0,05$). Peak heart rate (HR max) and after 1 minute of rest (HRR1) were improved in patients with PCI. Most importantly, maximal oxygen consumption (VO2 peak) in patients with PCI (17,17±3,34 vs 19,37±3,97 ml/kg/min, respectively, $p < 0,01$), maximum production of carbon dioxide-VCO2 peak (1.56±0.34 vs 1.84±0.38 ml/kg/min, respectively, $p < 0,01$) in patients with PCI (1,48±0,40 vs 1,69±0,44 ml/kg/min, respectively, $p < 0,05$) in patients with CABG. No major adverse cardiac events were noted during the rehabilitation program.
Conclusions. Exercise training after 3 weeks in patients with acute MI treated with PCI and CABG is safe and improves functional capacity and maintain values after6-months period of follow up. Functional capacity was not significantly difference in patients with associated COPD, mild and moderate degree.

O024 Renal denervation – Guidelines and our results

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Renal denervation is an interventional procedure used to treat patients with resistant hypertension, meaning their blood pressure remains high despite being on multiple antihypertensive medications. It is based on the ablation of sympathetic nerves around renal arteries by using different methods. A thorough evaluation of the patient's medical history, current medications, and the cause of their hypertension is important to determine if they are suitable candidates for the procedure. Renal denervation should be carried out by a multidisciplinary team including interventional cardiologists, radiologists, and hypertension specialists. Collaboration ensures that patient selection, procedure technique, and follow-up care are optimal. Before undergoing renal denervation, patients should undergo a comprehensive evaluation to rule out secondary causes of hypertension. This may involve blood tests, imaging studies, and other relevant assessments to determine the cause and extent of their hypertension. Renal denervation techniques can vary, including radiofrequency ablation and ultrasound-

based methods. The procedure involves delivering energy to the renal arteries to disrupt the nerves that contribute to high blood pressure. The exact technique used can depend on the expertise of the medical team and the available technology. Recent trails demonstrated benefit in reducing both ambulatory and 24h monitoring values of blood pressure, independently of medical therapy usage. These results were supported in recently published guidelines for the treatment of hypertension, signifying the new chapter for this promising therapeuthic modality.

O025 Influence of mediterranean diet in prevention of atherosclerotic cardiovascular diseases

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Cardiovascular disease is a leading cause of mortality in most countries of the world. Atherosclerosis is a chronic inflammatory disease of the arterial walls and is the primary cause of cardiovascular disease. Besides drugs and invasive interventional measures (revascularization), lifestyle is a clear determinant of both incidence and recurrence of cardiovascular events. Changes in diet and lifestyle in the prevention of cardiovascular disease and atherosclerosis have received greater attention in recent years. Mediterranean diet, characterized by a relatively high proportion of fruits, vegetables, legumes, cereals, white meat and fish as the primary source of protein, and olive oil as the main source of fat, traditionally had been identified as a diet with a potential healthy composition. Various mechanisms have been proposed to explain the cardioprotective effect of nutraceuticals such as stabilization of vulnerable atherosclerotic plaques or reduction of inflammatory biomarkers. The effect of omega-3 polyunsaturated fatty acids, hydroxytyrosols, lycopene, polyphenols from cereals, fruits and vegetables is described. Nutraceuticals are natural compounds which come from food sources and can have a positive effect on the blood vessel wall. Numerous nutraceuticals have been shown to have potential anti-inflammatory effects, making them promising compounds for exploring novel anti-atherogenic therapies. Although studies indicate significant effects of nutraceuticals, large, serious clinical trials are needed to determine their full effectiveness in the prevention of atherosclerosis and cardiovascular disease therapy.

O026 Magnetic resonance of the heart - the optimal method in the differential diagnosis of MINOCA

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In large observational studies, the proportion of patients presenting with myocardial infarction without the obstruction of coronary arteries (MINOCA) ranges between 4-13%. The pathophysiological basis of myocardial injury in these patients includes various mechanisms including atherosclerotic plaque rupture, coronary artery dissection, coronary artery spasm, type 2 myocardial infarction, clinically unrecognized myocarditis,Takotsubo cardiomyopathy, and others. Cardiac magnetic resonance (CMR) is a non invasive and non-radiating imaging technique that provides valuable information regarding the morphology, structure, and function of the heart, making it a crucial tool in diagnosing and managing various cardiovascular conditions. Based on a meta-analysis of cardiomagnetic resonance studies in patients with MINOCA, it was concluded that in 33% of cases the cause was myocarditis, in 24% a typical picture of acute myocardial infarction, while in 26% of cases no significant abnormalities were registered. Other causes include the presence of Takotsubo cardiomyopathy, dilated cardiomyopathy, apical hypertrophy, and thrombophilia-related disorders. Thanks to numerous modern techniques of myocardial tissue characterization, it is possible to conclude about the mechanisms of myocardial damage based on the presence and distribution of edema and scar, i.e. fibrosis. In this way, it is possible to differentiate between the existence of acute myocardial infarction, myocarditis, Takotsubo cardiomyopathy and other substrates. It's important to note that while CMR can provide valuable information in patients with MINOCA, it's just one part of the diagnostic process. A comprehensive evaluation, including clinical history, physical examination, blood tests, and other imaging modalities, is essential to accurately diagnose and manage patients with this condition.

O026 Troponin in the diagnosis of AMI: required time and reliability (are we following the recommendations?)

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According to current guidelines, for definitive AMI diagnosis increased troponin concentration is required (of ischemic origin); this underlines the significance of troponin. Very importantly, it is not yet properly defined is the optimal cut-off to exclude AMI the limit-of-detection or an arbitrary cut-off or 99th centile, either sex-specific or not. The easiest way is not the optimal one. There is a minimal doubt (if at all) that cut-offs for AMI should be sex- and age-specific. High sensitive troponin assays decreased but did not eliminate the possibility of false positive troponin, a phenomenon that is difficult to recognize, having in mind the highest sensitivity of troponin (as compared to other markers of myocardial necrosis).
Troponin T and I differ in several ways including presence of diurnal variations, presence of the second peak in the course of AMI, etc. They also differ in cut-offs for AMI diagnosis in patients with renal failure, according to a meta-analysis. It is also important to recognize the troponin cut-offs for patients on dialysis, separately for hemo- and peritoneal. Moreover, the specificity of troponin for type 1 AMI diagnosis is

decreased in AF patients. Certain troponin cut-offs at presentation are capable of differentiating type 1 from type 2 AMI with 90% specificity for type 1 AMI. The place of ESC 0/1 h algorithm in the early recognizing of AMI is an important issue. Do we follow the ESC guidelines properly? It is also challenging to differ between NSTEMI vs. unstable angina with myocardial injury (due to e.g. heart failure or renal failure). Notably, myocardial injury (in the absence of AMI) is also related to the presence of CAD and its risk factors, as well as prognosis.
Conclusion: troponin is a cornerstone for AMI diagnosis, but numerous important issues need to be solved in order to optimize its utility. Putting troponin concentration (and its changes during observation) in a clinical context is necessary, as well as wisdom in interpretation.

O027 When the ICD goes silent

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Sudden cardiac death (SCD) accounts for 50% of all cardiovascular deaths. In 80% of patients, SCD is caused by arrhythmias, the most common of which is monomorphic ventricular tachycardia (VT). The implantable cardioverter defibrillator (ICD) represents the most effective therapeutic approach for the primary and secondary prevention of SCD in patients with symptomatic heart failure (EF ≤35%). Modern ICD devices have numerous additional functions that improve diagnostics, reduce unnecessary pacing and conserve energy use. The most important role remains the ability of pacemaker to recognise a complex ventricular arrhythmias and to delivery shock of appropriate energy, to terminate it. Complications that occur during ICD implantation can be related to the implantation technique, infections, battery or electrode malfunction. Dysfunction of the electrode most often means inadequate analysis of incoming signals (undersensing and oversensing). Our patient is a long-term coronary patient, 59 years old man, with ischemic cardiomyopathy and reduced contractile function of the left ventricular myocardium (LVEF 30%). Due to complex ventricular rhythm disorders (VT), an ICD was implanted in 2018, as primary prevention of SCD. In May 2023, he was hospitalized at the Cardiology Clinic of Institute Niska Banja, due to the feeling of an accelerated and irregular heartbeat. Continuous ventricular tachycardia was registered on the ECG, converted to sinus rhythm by synchronous DC shock (100J). Patient was sent to the electrical control of the ICD, where the device was reprogrammed.

O028 Perioperative management of patients on dual antiplatelet therapy who have high hemorrhagic risk

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There is an increasing number of patients treated with percutaneous coronary intervention (PCI) with intracoronary stents, who use dual antiplatelet therapy (DAPT) and who at some point have to undergo a specific surgical intervention or invasive procedure. The perioperative preparation of these patients requires careful consideration of all risks arising from the patient and the procedure itself, including the risks of thrombosis and bleeding. Very often, a multidisciplinary approach is necessary to optimize the therapy of these patients.
All surgical interventions can be divided into those with minor, low and high risk of bleeding. Operations in which bleeding complications are common or of major clinical importance include abdominal surgery, extensive cancer resection surgeries, neurosurgical procedures and surgery using neuraxial anesthesia, major orthopedic surgery, thoracic and lung resection surgery, and major vascular surgery. Patient-related factors that increase the risk of bleeding during surgical interventions are older age, lower body mass, female gender, coagulation disorders, and the presence of numerous comorbidities such as diabetes mellitus, renal insufficiency and liver disease.
According to the latest recommendations of the European and American Cardiovascular Societies, it is advised to postpone elective operations until the end of the complete DAPT administration period (6 months after elective PCI or 12 months after PCI in acute coronary syndrome). In patients who have a high risk of bleeding or need for emergency surgery, DAPT is recommended at least one month after elective PCI, or 3 months after PCI in the case of ACS. With the definition of a high hemorrhagic risk in a certain patient, an interventional cardiologist is also involved in order to additionally shorten the time of DAPT administration by applying the latest generation of stents or performing balloon dilatation.
It is recommended to use aspirin in the perioperative period, while the P2Y12 inhibitor should be stopped 3-7 days before surgery. Aspirin can be discontinued in case of surgery with a high risk of bleeding (e.g. in neurosurgical intervention s) and if there is a low risk of ischemia. Such surgical interventions should be performed in hospitals with PCI centers available 24 hours a day, 7 days a week. Routine application of platelet function tests is still not recommended, but in individual cases it can be of great importance in determining the time to start surgical intervention.

O029 Spontaneous coronary artery dissection requiring percutaneous coronary intervention

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Introduction. True prevalence of spontaneous coronary artery dissection (SCAD) remains unknown , largely due to underdiagnosis. It is forcefully seen in young and middle-aged women (age 44-62) lacking typical cardiovascular risk factors. Risk factors is fibromuscular dysplasia, postpartum status and connective tissue disorders. The gold standard diagnostic modality is coronary angiography. When the diagnosis is challenging, supported by intracoronary imaging.
Case report. A 42 years -old female was admitted in the our hospital because the ST-elevation myocardial infarction . She had experienced the chest pain 1 hour prior the admission. The patient also had anxiety as a comorbidity. No risk factors for cardiovascular diseases. Upon admission, the patient was alert and orientated, hemodynamically and rhythmically stable, without signs of heart failure. Electrocardiogram showed ST segment elevation in DII, DIII, aVF. Urgent coronarography was performed and suspected SCAD, type 2, in the ramus marginalis was registered. Than performed intracoronary imaging (intravascular ultrasound) and SCAD was confirmed. Because patient was not symptoms ongoing ischaemia and was rhythmically stable, we decided for medicament therapy. After two hours, patient had chest pain and on ECG was registered ST segment elevation in DII, DIII, aVF larger than on admission. Urgent coronarography was performed and now ramus marginalis was occluded. Two drug-eluting stent (2,25x18 and 2,5x24mm) was implanted, with the overlap technique, with optimal result. After intervention patient is hemodynamically and rhythmically stable, without chest pain.
Conclusion. In young patient, women in the peripartum, patients with connective tissue disorders and thoratic aortic disease should be thought on SCAD. Intravascular imaging could contribute to the reduction the number of unrecognized SCAD. Revascularisation is recommended only for patients at high risk due to left main coronary artery dissection, ongoing ischemia, severely limited flow, hemodynamic instability or refractory arrhytmia.

O030 A rare cause of acute pulmonary edema

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Introduction. Pheochromocytoma, a rare but potentially life-threatening neuroendocrine tumor, is known to cause a diverse array of symptoms due to excessive release of catecholamines, such as adrenaline and noradrenaline. Among the myriad manifestations of this tumor, one particularly alarming and critical complication is its association with acute pulmonary edema.
Case report. A 51-year-old male, with a previous history of arterial hypertension, was admitted to the Cardiac Intensive Care Unit due to chest pain and sweating that occurred one hour prior to admission, electrocardiographically verified ST segment elevation in the lateral leads and a clinical picture of acute pulmonary oedema, hypertensive, in atrial fibrillation with rapid ventricular response. Upon admission, the patient was endotracheally intubated, mechanically ventilated, and emergency coronary angiography revealed a normal coronary angiogram. A bedside echocardiography showed a globally hypokinetic left ventricle with reduced ejection fraction of 20%. Laboratory analyses taken upon admission showed elevated values of myocardial necrosis and inflammatory markers. A CT pulmonary angiography revealed a less extensive pulmonary embolism of the right lung, signs of perihilar alveolar edema with diffuse pleural effusions and a dilated left ventricle. CT of the aorta showed a thoracic aorta with a preserved lumen. As an incidental finding, a highly suspicious soft tissue change of the right adrenal gland with pheochromocytoma (6x7cm) and a thrombosed aneurysm of the left renal artery were recorded. During the hospital course, the patient was treated with intensive acute heart failure therapy, alpha and beta antagonists, but very quickly refractory cardiogenic shock occurred followed with cardiac arrest, and despite all cardiopulmonary resuscitation measures, death occurred in less than 24 hours from the admission. Laboratory results received after the patient's death showed highly elevated levels of both metanephrine and normetanephrine. The autopsy findings confirmed the existence of pheochromocytoma.
Conclusion: Timely recognition and diagnosis of pheochromocytoma in patients presenting with acute pulmonary edema is crucial for appropriate management and improved patient outcomes and therefore clinicians should maintain a high degree of clinical suspicion, especially when facing atypical cases, to ensure comprehensive and effective care.

O031 Atipical cause of pericarditis

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Introduction. Inflammation of the pericardium, or pericarditis, is a frequent cause of chest pain in young patients. The pericardium may be affected by all categories of diseases, including infectious, autoimmune, neoplastic, iatrogenic, traumatic, and metabolic. Pericarditis is responsible for 0.1% of all hospital admissions and 5% of emergency room admissions for chest pain.
Case summary. A 19-year-old female presents with a recurrence of complaints in the form of chest pain that intensifies during inhalation and tachycardia. An echocardiographic examination shows the presence of a large pericardial effusion, without echocardiographic signs of cardiac tamponade, thickened visceral sheet of the

pericardium, and bilateral pleural effusions. Previously treated in the regional health center for pericardial and pleural effusion, treated with antibiotics and corticosteroid therapy, after which the symptoms subsided. In most cases, treatment is primarily supportive, because pericarditis is often self-limited, and includes administration of non-steroidal anti-inflammatory drugs or colchicine. However, other potential causes of pericarditis may have distinct prognostic and therapeutic implications. In our case without a clear cause of pericarditis, negative microbiological and serological analyses, an investigation was started in the direction of an immunological disease, a weakly positive ANA was registered. After the reappearance of the symptoms, tests were expanded, which confirmed Lyme disease through serological testing. Antibiotic therapy was introduced by the infectious disease specialist. further echocardiographic monitoring showed the absence of recurrence of pericardial and pleural effusion.
Conclusion. Clinicians should be aware of alternative etiologies to pericarditis in patients who present with prolonged or refractory symptoms. This case report demonstrates that borrelial infection may lead to pericarditis.

O032 Left atrial appendage closure in treating selected patients with atrial fibrillation

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Left atrial appendage closure (LAAC) is a medical procedure used to reduce the risk of stroke in patients with atrial fibrillation, a common heart rhythm disorder. The procedure involves sealing off the left atrial appendage, a small pouch-like structure in the heart's left atrium, which is thought to be a common site for blood clot formation in individuals with atrial fibrilation. In atrial fibrillation, the heart's atria do not contract effectively, leading to the pooling of blood in the atria. This stagnant blood can form clots, and if a clot dislodges, it can cause a stroke. The left atrial appendage is a frequent location for these clots to form. During a left atrial appendage closure procedure, a device is typically used to block or close off the opening of the appendage. This prevents blood from pooling and reduces the risk of clot formation. LAAC is considered for patients with atrial fibrillation who are at high risk for stroke but have contraindications to long-term use of blood-thinning medications like warfarin or direct oral anticoagulants. These patients might be at risk for bleeding complications from these medications. There are several devices that can be used for LAAC. It's important to note that LAAC is a procedure that requires careful patient selection and evaluation. Potential risks and benefits should be discussed thoroughly between the patient and their medical team. Although left atrial appendage closure is generally considered a safe procedure, but like any medical intervention, it carries potential risks and complications. The specific risks and complications associated with LAAC can vary based on factors such as the patient's overall health, the type of device used, the skill of the medical team, and other individual factors.

O033 Cardiac magnetic resonance in coronary artery disease – the importance of evaluating coronary microcirculation

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Ischemia without obstruction of the coronary arteries (INOCA) represents an important clinical entity. More than half of patients with symptoms of stable angina pectoris who are referred for invasive coronary angiography have normal angiographic findings or findings of non-obstructive coronary disease, even in the presence of evidence of myocardial ischemia. Patients with coronary microvascular dysfunction (CMD) have not only a worse quality of life, consequently a higher number of repeated hospitalizations and unnecessary coronary angiography, but also a 2- to 4-fold higher risk of future serious adverse cardiovascular events. The diagnosis of CMD can be established by both invasive and non-invasive diagnostic methods. Diagnostics of microvascular dysfunction through cardiomagnetic resonance is established by analyzing myocardial perfusion during the adenosine stress test in comparison with myocardial perfusion at rest, which actually evaluates the coronary flow reserve. Methods within cardiac magnetic resonance to prove and evaluate the existence of coronary microvascular dysfunction can be qualitative and quantitative. A qualitative method of assessment includes visual evaluation of the perfusion in stress, whereby a characteristic diffuse subendocardial defect in perfusion is observed. Semiquantitative and, especially, quantitative methods of evaluation of the stress perfusion study are used for definitive assessment. Quantitative methods of assessing CMD can, in addition to establishing a diagnosis, evaluate the severity of the disease, as well as monitor the effect of different therapeutic modalities. New sophisticated and fully automated cardiac magnetic resonance methods in the analysis of myocardial perfusion enable high diagnostic accuracy, strong prognostic significance, as well as complete independence from the level of staff training. In studies that used a fully quantitative assessment of the stress perfusion, an excellent correlation was shown with the values of invasively measured coronary flow parameters, but also with the value of the index of microvascular resistance (IMR).

O034 Gastroprotection

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Gastroprotection is the protection of the gastric mucosa during the use of potentially ulcerogenic drugs in order to

prevent bleeding from the gastrointestinal tract. On the mucous membrane of the upper part of the digestive tract, aggressive factors such as salicylates, NSAIDs, acidopept action of gastric juice and Helicobacter pylori infection. The defense force consists of prostaglandins, a layer of mucus. bicarbonate secretion, the integrity of the epithelium and good blood flow to the mucosis. It is important that there is a homeostasis between these factors in order to avoid side effects. The mechanism of salicylate-induced mucosal damage of GIT and NSAIDs is conditioned by blocking prostaglandin synthesis, reducing mucus and bicarbonate production, local mucosal damage as well as pro-inflammatory effect caused by the release of inflammation mediators. Acute bleeding from the upper parts of the digestive tract is the most common emergency in gastroenterology with significant morbidity and mortality. The approach to solving this problem has changed significantly by introducing proton pump inhibitors and transendoscopic hemostasis. The mortality rate from bleeding from the upper part of the GIT is about 10% and has remained unchanged for the last 50 years. This is caused by uneven use of gastroprotection, large use of salicylates and NSAIDs, antigoagulants, antiaggregation therapy as well as prolonged life expectancy that inevitably brings a greater number of comorbidities. The reduction in the frequency of acute bleeding from the upper part of git was achieved by increased use of proton pump inhibitors as well as systematic eradication of Helicobacter pylori infection. Today, gastroprotection is performed exclusively by proton pump inhibitors and the patient must obtain information about the use of salicylates, NSAIDs, antiaggregation therapy, anticoagulant therapy, corticosteroids or selective serotonin reuptake inhibitors. The problem arises because gastroprotection is given to only 20% of patients who they use salicylates and NSAIDs and the prescribed gastroprotection is adhered to by 70% of users, which significantly increases the likelihood of bleeding from the upper part of the GIT. Gastroprotection is also important in the absence of risk factors for bleeding because it reduces the likelihood of it occurring by 50%.

O035 Cardiorenal syndrome - A Nephrologist's Insight

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The cardiorenal syndrome represents a complex pathophysiological condition entailing a profound interplay between cardiac and renal functions. This interconnection becomes a pivotal focal point for understanding and managing this state. The cardiorenal syndrome can culminate in acute or chronic perturbations in both cardiac and renal functions, whereby impairment in one organ may lead to immediate or gradual dysfunction in the other. It is important to emphasize the importance of factors such as hemodynamics, neurohormonal markers and inflammatory processes in the development of the syndrome. The imperative is to identifying biomarkers associated with the syndrome to facilitate early diagnostics and timely intervention. Furthermore, the significance of novel therapeutic approaches is emphasized, encompassing renin-angiotensin-aldosterone system inhibitors, mineralocorticoid receptor antagonists, and other antifibrotic agents in development, to modulate fibrosis as a pivotal component of cardiorenal syndrome's pathogenesis. Hence, the close collaboration between cardiologists and nephrologists is of paramount importance in the diagnosis and treatment of patients with cardiorenal syndrome.

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