

Publicatii

1. Derșidan, Anca Alexandra, Ciucanu, Claudiu Constantin, Ilioniu, Agatha Maria, Bodiu, Ionela Georgiana, Covalcic, Carina Diana, Szanto, Ludovic Alexandru and Mureșan, Adrian Vasile. "Neutrophil-to-Lymphocyte Ratio and Systemic Inflammation Index as Predictors of Poor Outcome in Patients with Critical Limb Ischemia Treated with Remote Endarterectomy" *Journal of Cardiovascular Emergencies*, vol.8, no.4, **2022**, pp.67-74. <https://doi.org/10.2478/jce-2022-0013>
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ORIGINAL RESEARCH

Neutrophil-to-Lymphocyte Ratio and Systemic Inflammation Index as Predictors of Poor Outcome in Patients with Critical Limb Ischemia Treated with Remote Endarterectomy

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ABSTRACT

Introduction: Severe ischemia occurring in the lower limbs represents the advanced stage of peripheral artery disease (PAD). Atherosclerosis and inflammatory markers have been intensively studied to identify prognostic tools with a role in the evolution of patients with PAD. The aim of this study is to demonstrate the predictive value of systemic inflammatory markers such as the neutrophil-to-lymphocyte ratio (NLR) and the systemic inflammation index (SII) in the prognosis of patients diagnosed with critical leg ischemia (CLI) undergoing infrainguinal surgical revascularization with remote endarterectomy. **Materials and methods:** This retrospective study included all patients admitted to the Vascular Surgery Clinic of the County Emergency Clinical Hospital of Târgu Mureș, Romania between January 2018 and December 2021, who had critical limb ischemia Leriche-Fontaine stage III and were treated with endarterectomy. Patients were divided into two groups based on the presence or absence of patency in the lower limbs at 12 months. **Results:** There was a higher baseline value of neutrophil count ($p < 0.0001$), platelet count ($p = 0.006$), NLR and SII value ($p < 0.0001$), as well as a lower value of lymphocyte count ($p = 0.001$) in the group without patency at 12 months. The ROC curve analysis showed that the NLR and SII were associated with the risk of major amputation and primary patency failure at 12 months, while multivariate analysis has shown that arterial hypertension (OR 3.63, $p = 0.04$), history of myocardial infarction (OR 2.93, $p = 0.009$), diabetes mellitus (OR 2.20; $p = 0.04$) and smoking (OR 3.48, $p < 0.0001$) were also predictors of primary patency failure. **Conclusions:** The results of this study demonstrated the predictive role of NLR and SII regarding poor outcomes among patients with CLI Leriche-Fontaine stage III undergoing infrainguinal surgical revascularization with remote endarterectomy.

Keywords: neutrophil-to-lymphocyte ratio, systemic inflammation index, critical limb ischemia, remote endarterectomy, biomarkers

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Case Report

Pregnancy-Associated Spontaneous Coronary Acute Dissection as a Cause of Sudden Cardiac Death—Autopsy Findings and Literature Review: Is COVID-19 Related?

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Abstract: Sudden cardiac death (SCD) is the leading cause of mortality globally (violent or non-violent), with few to no feasible remedies. The etiopathogenesis of SCD involves a complex and multilayered substrate in which dynamic factors interact with a preexistent cardiovascular pathology, which is often undiagnosed and untreated, leading to the rapid development of cardiac rhythm disorders and cardiac arrest. Cardiovascular disease is a rare but emerging factor in maternal mortality that can be justified by an upward trend in the mean age of pregnant individuals. Spontaneous coronary artery dissection (SCAD) is defined as a non-traumatic and non-iatrogenic separation of the coronary arterial wall by intramural hemorrhage with or without an intimal tear. The resulting intramural hematoma compresses the coronary arteries, reducing blood flow and causing myocardial ischemia. SCAD continues to be misdiagnosed, underdiagnosed, and managed as an atherosclerotic acute coronary syndrome, which may harm patients with SCAD. The latest research shows that individuals who have or have had coronavirus disease 2019 (COVID-19) may also present coagulation abnormalities, so infection with COVID-19 during pregnancy can increase this hypercoagulable condition, thus increasing the risk of SCAD and SCD. This present study reports two cases over 35 years, one being infected with SARS-COV2 one month before the event and the other being tested positive during admission, both asymptomatic, who were declared healthy on periodic clinical evaluations, with pregnancies over 35 weeks, with normal fetal development, which suddenly caused chest pain, dyspnea, and loss of consciousness, required emergency c-sections, and died suddenly after they were performed. In both cases, the cause of death was SCAD on the anterior-descending artery. In both cases, emergency percutaneous coronary intervention was performed. The second part

Article

Intimal CD31-Positive Relative Surfaces Are Associated with Systemic Inflammatory Markers and Maturation of Arteriovenous Fistula in Dialysis Patients

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Abstract: Background: Arteriovenous fistula dysfunction is a widely disputed subject in the scientific literature on end-stage kidney disease (ESKD). The main cause of mortality and morbidity in these patients is the non-maturation or dysfunction of the arteriovenous fistula. Despite the many complications, the native arteriovenous fistula remains the gold standard in the treatment of these patients requiring renal replacement. This study aims to discuss the predictive role of some systemic inflammatory biomarkers (NLR, PLR, SII, IL-6), intimal hyperplasia, and neoangiogenesis (characterized by intimal-media CD31-positive relative surface) in arteriovenous fistula maturation failure. Methods: The present study was designed as an observational, analytical, and prospective study which included patients diagnosed with ESKD with indications of radio-cephalic arteriovenous fistula (RCAVF). Demographic data, comorbidities, preoperative laboratory data and histological/digital morphometry analysis results were processed. The patients included were divided into two groups based on their AVF maturation status at 8 weeks: “Maturation” (Group 1) and “Failed Maturation” (Group 2). Results: There was no difference in the demographic data. In terms of comorbidities, the second group had a greater incidence of heart failure ($p = 0.03$), diabetes ($p = 0.04$), peripheral artery disease ($p = 0.002$), and obesity ($p = 0.01$). Additionally, regarding the laboratory findings, these patients had higher levels of serum uric acid ($p = 0.0005$), phosphates ($p < 0.0001$), and creatinine ($p = 0.02$), as well as lower levels of total calcium ($p = 0.0002$), monocytes ($p = 0.008$), and lymphocytes ($p < 0.0001$). Moreover, all inflammatory markers ($p = 0.001$; $p < 0.0001$; $p = 0.006$, and $p = 0.03$) and Ca-P product ($p < 0.0001$) had higher baseline values in Group 2. Upon immunohistochemical analysis, regarding the density of neoformed vessels, there was a higher incidence of CD31-positive surfaces ($p = 0.006$) and CD31-positive relative surfaces ($p = 0.001$); the NLR ($r = 0.323$; $p = 0.03$), PLR ($r = 0.381$; $p = 0.04$), SII ($r = 0.376$; $p = 0.03$), and IL-6 ($r = 0.611$; $p < 0.001$) are all significantly correlated with vascular density, as evidenced by CD31. Conclusions: Heart failure, peripheral artery disease, obesity, and diabetes, as well as the systemic inflammatory markers (NLR, PLR, SII,

Article

Increased Epicardial Adipose Tissue and Heart Characteristics Are Correlated with BMI and Predict Silent Myocardial Infarction in Sudden Cardiac Death Subjects: An Autopsy Study

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Abstract: Background: Sudden cardiac death (SCD) is a significant global public health issue and the leading cause of death worldwide. Its etiopathogenesis is complex and multilayered, involving dynamic factors interacting with a preexistent cardiovascular pathology, frequently unknown, and resulting in cardiac rhythm disorders and cardiac arrest; Methods: This study conducted a retrospective descriptive analysis over a one-year period, identifying 321 autopsy cases of sudden deaths from the Institute of Legal Medicine in Mures County, Romania, in 2019. From the 321 sudden death cases, 189 autopsy reports were selected for analysis based on inclusion and exclusion; Results: The autopsies had a mean age of 61.16 years and included 140 males and 49 females. No significant differences were found between the silent myocardial infarction (SMI) and no-SMI groups regarding demographic data. The SMI group exhibited higher thickness of LV (left ventricle), IV (interventricular septum), EAT LCx (epicardial adipose tissue at left circumflex artery), EAT LAD (epicardial adipose tissue at left anterior descending artery), heart weight, and BMI (body mass index). The left coronary artery showed a higher incidence of type V plaques, while the right coronary artery showed higher incidences of type V and type VI plaque. The SMI group also exhibited a higher incidence of moderate and severe valvular atherosclerosis, severe left ventricle dilatation, and a lower incidence of mild left ventricle dilatation. In addition, the SMI group showed a higher presence of contraction band necrosis on histological examination. Multivariate analysis revealed that type V and type VI plaques for the right and left coronary arteries, moderate and severe valvular atherosclerosis, severe left ventricle dilatation, heart weight, EAT LCx, EAT LAD, LV thickness, IV thickness, BMI, and the presence of



Review

Ledderhose's Disease: An Up-to-Date Review of a Rare Non-Malignant Disorder

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Abstract: Plantar fibromatosis (or Ledderhose's disease) is a rare benign condition, difficult to treat, defined by gradual-growing nodules in the central medial part of the plantar fascia, with the possibility of sclerosis and shrinkage of the entire fascia or, rarely, contractures of the toes. From a histopathological point of view, it is linked to Dupuytren's contracture of the hand and Peyronie's disease of the penis, being part of a large group of fibromatoses, based on a proliferation of collagen and fibroblasts. Its etiology is still not fully understood, even though it has been associated with trauma, diabetes mellitus, use of anticonvulsants, frozen shoulder, alcohol consumption, and liver disease. Typically, ultrasound confirms the diagnosis, and magnetic resonance imaging is used for more aggressive and advanced types. Several conservative treatment techniques, such as steroid injections, verapamil, imatinib, radiation therapy, extracorporeal shock wave therapy, tamoxifen, sorafenib, mitomycin C, and collagenase, have been documented. When non-operative care fails, surgical measures may be considered, even though recurrence is expected. We attempted to provide a better understanding of this disease by covering all of the important aspects: its history, clinical and radiologic findings, diagnosis, pathophysiology features, conservative and surgical treatment, recurrence rate, and prognosis.

Keywords: Ledderhose's disease; plantar fibromatosis; non-malignant disorders; treatments; review

1. Introduction

Plantar fibromatosis (or Ledderhose's disease) is a rare benign condition, difficult to treat, defined as a hyperproliferative disorder of the plantar aponeurosis and also by the formation of the nodules of the sole. There is evidence saying that it was first reported by Plater in 1610 [1], or that Madelung, in 1875, described the very first case [2]. Nevertheless, it is widely accepted that, after studying more than fifty cases, the German physician Dr. George Ledderhose presented it to the world in greater detail in the year 1894 [3,4]. Including Dupuytren's contracture of the hand and Peyronie's disease of the penis, this condition is part of a large group of fibromatoses, based on the proliferation of collagen and

ORIGINAL RESEARCH

Ex-vivo Mechanical Augmentation of Human Saphenous Vein Graft By UV-A Irradiation in Emergency Vascular Reconstruction – Preliminary Results

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ABSTRACT

Introduction: In vascular reconstruction in arterial trauma, ruptured abdominal aortic aneurysm or ruptured aneurysmal arteriovenous fistula, the challenge no longer lies in the surgical procedure itself, but rather the prevention of intimal hyperplasia, thrombosis and aneurysm formation, in parallel with extending as long as possible the patency of the grafts. The **aim** of this study is to present the preliminary findings of a novel non-ionizing radiation-based therapeutic method for stabilizing and strengthening the extracellular matrix of the venous wall, improving the biomechanical profile of the autologous graft used in myocardial and lower limb revascularization. **Material and methods:** We developed the protocol and method for

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CASE REPORT

The Use of Simulation and Deep Learning Models in the Endovascular Treatment of Ruptured Intracranial Aneurysms: A Case Report

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ABSTRACT

Introduction: The current paper presents an examination of the emerging role of deep learning-based simulation software in enhancing preprocedural planning for intracranial aneurysm treatment using flow diverters. Intracranial aneurysms pose significant risk due to their potential rupture leading to life-threatening subarachnoid hemorrhage. Innovative endovascular treatment options like flow diverters, which redirect blood flow and promote healing, are gaining attention. The role of simulation software in optimizing these procedures is becoming increasingly crucial. **Case presentation:** This study involves a 47-year-old female patient diagnosed with an intracranial aneurysm. Through diagnostic angiography and 3D rotational angiography imaging, the complex aneurysm anatomy was determined and the need for flow diverter placement ascertained. The Sim&Size™ software was used to simulate the size and placement of the flow diverter, based on the patient’s specific vascular anatomy. The procedure, including the placement of the flow diverter as per the simulation, was successful. **Conclusion:** The Sim&Size™ simulation software significantly contributes to the enhancement of intracranial aneurysm treatment planning. By providing patient-specific simulations, it improves procedural precision and reduces the risk of complications, thus potentially optimizing patient outcomes. However, the quality of the simulation is contingent on the accuracy of the input data, and it does not account for physiological dynamics. Despite these limitations, this tool represents a promising development in neurointerventional practice.

Keywords: intracranial aneurysms, flow diverter, simulation software, endovascular treatment

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