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## MITRAL VALVE REPAIR – STATE OF THE ART

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Mitral valve repair is the method of choice for surgical correction of mitral regurgitation.

Since the introduction of this technique by Alain Carpentier in 1973, the feasibility of the mitral repair became more and more common in many centers. Mitral repair is still subject to a difficult learning curve. The success of the repair also depends on the pathology and on other factors, including the surgical skill of the team.

We present the history of this technique and the more important steps as well as the fundamental etiologic, anatomic, functional and the principals basis of this surgery.

In this work, we analyses the state of the art of mitral valve repair and its results according to our experience of 130 cases operated at C. C. Iliescu Institute of Cardiovascular Diseases, Vasile Candea Army Center of Cardiovascular Diseases and SANADOR HOSPITAL, and in the light of recent reports.

**Keywords:** mitral repair, minimal invasive, state of the art

## LONG-TERM GRAFT PATENCY AFTER CORONARY ARTERY BYPASS GRAFTING. EFFECTS OF GRAFT SELECTION AND SURGICAL EXPERTISE

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**Introduction.** Completeness of revascularization is a factor conditioning intermediate and late survival. The choice of coronary conduits has been debated for decades with no consensus concerning the optimal grafting design in terms of graft type and surgical technique. The primary endpoint of the study consists in identifying the ideal grafting technique according to coronary territory in a group of patients benefiting from graft patency evaluation using coronary computed tomography angiography (CCTA) at minim 10 years after coronary artery bypass grafting (CABG).

**Methods.** The authors compared long-term outcome of CABG conduits in relation to graft morphology, target vessel and surgical expertise in a group of 127 patients that underwent CABG in a single centre between 2000-2006 (29.92% total arterial revascularization - TAR) and presented for long-term CCTA evaluation of graft patency between 2013-2016 at an average of  $129.78 \pm 36.64$  months after CABG.

**Results.** There were analysed 399 grafts (mean  $3.14 \pm 1$ /patient) – 179 venous (SVG) and 220 arterials. For the right coronary territory, the highest patency rate was obtained with radial artery grafts (RAG) – 80.65%, for circumflex territory with SVG (82.54%) and for diagonal arteries with right internal thoracic artery – 92.86%. Left internal mammary artery (LIMA) was anastomosed to the left anterior descending artery with a patency rate of 90.17% and unexplained occlusion (no competitive flow) only in 4.1%. Identified risk factors for SVG occlusion were grafting to RCA, target vessel calibre  $<1.5$  mm, female sex, family history and coronary endarterectomy. For arterial grafts, multisite artery disease, target vessel stenosis  $<90\%$ , target vessel calibre  $<1.5$  mm, Y anastomosis angle  $>56^\circ$ , and distal anastomosis angle  $>60^\circ$  augmented occlusion risk. RAG registered a lower patency rate when anastomosed “Y” to LITA (61.90%) compared to the ascending aorta (85%). SVG had a lower occlusion rate in sequential anastomosis compared to arterial grafts (22.22% for end-to-side anastomosis and 0% for side-to-side versus 35% for end-to-side and 45% for side-to-side).

**Conclusions.** An optimal grafting design with favourable long-term patency can be imagined for each coronary territory based on morphological and morphometric analysis of follow-up CCTA.

**Keywords:** coronary artery bypass grafting, long-term graft patency, predictors, surgical expertise

## LEFT VENTRICULAR ASSIST DEVICE AS BRIDGE TO HEART TRANSPLANTION – OUR EXPERIENCE

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The left ventricle assist devices (LVADs) are miniaturized implantable pumps that offer mechanical circulatory support for patients in end stage cardiac failure. The goal is to emphasize that LVADs should be used as a bridge to transplantation (BTT) or destination therapy (DT) for patients unresponsive to maximal medical therapy. We present the case of a 45 years old patient, who was diagnosed in his teens with obstructive hypertrophic cardiomyopathy that progressed to dilated cardiomyopathy. Besides this, the patient has an inherited hypercoagulability state - Factor V Leiden. Also, he has mutations such as Factor XIII V34L which offers protection against venous thromboembolism and EPCR- A1/A1- a protective factor for those with Factor V Leiden. In 2012 ICD was implanted for sustained monomorphic V-tach. Echocardiography revealed that the right-sided chambers were normal in size and the RV's pumping capabilities were not impaired. In contrast, the left side was dilated presenting diminished global ejection fraction 20-25%. Furthermore, the Doppler measurements showed a sPAP of 42 mmHg and a tricuspid regurgitation velocity of 2.9 m/sec, both of them indicating a possible pulmonary hypertension (PH). A right cardiac catheterization confirmed the PH with prohibitive pulmonary arteriolar resistances above 6 Wood units, contraindicating the transplant procedure. Decision was made to implant a Heartware LVAD as bridge to transplantation. The patient was supported on LVAD for 393 days prior to transplantation. During this time frame the patient's hemodynamics was significantly improved, with a immediately decrease of pulmonary artery pressure. The mPAP values dropped to as low as 21 mm Hg in the first 24 hours after the LVAD implantation procedure and the patient went from a class 4 NYHA to a class 3 for a variable period. The echo assessment of pulmonary hypertension revealed a mild one- mPAP was 27 mm Hg. The patient experienced no immediate postoperative complications. After 236 days of device assisted therapy he suffered a right middle cerebral artery (MCA) ischemic stroke. This episode was followed by two more strokes in the territory supplied by the left MCA. In February 2016 the patient underwent orthotopic heart transplantation, the bicaval anastomosis technique was used. At 15 months after transplantation the patient is in good clinical status without rejection episodes.

**Discussion.** The REMATCH trial provided evidence that in selected cases LVAD support offered a statistically significant reduction in the risk of death from any causes when compared to maximal medical therapy, with survival rates of 52% at 1 year vs 28% for those who received maximal medical therapy. Most common device associated complications: bleeding, infections, thromboembolic events, right-sided HF, device failure.

**Conclusion.** In our experience LVAD can be successfully used as a BTT providing notable survival and quality-of-life benefits compared to maximal medical therapy.

## MINIMALLY INVASIVE APPROACH IN MITRAL AND AORTIC VALVE SURGERY

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**Introduction.** The benefits of less invasive techniques in comparison with a median sternotomy in cardiac surgery has been shown in various studies and publications. Some of the highlighted advantages are: the risk of sternum dehiscence is reduced, the risk of wound infection is limited, the risk of bleeding is lower, the patient recovers faster with less pain and nevertheless the social impact of having a large median scar is lower than in patient with traditional sternotomy. There are several alternative access ways through small chest incisions, most common ones are the right anterior thoracotomy and upper hemisternotomy.

**Material and method.** During a period of 2 years (March 2015- March 2017) in Polissano European Hospital, Sibiu, 70 mitral valve surgeries and 90 aortic valve surgeries (out of which 25 were Perceval-Sutureless) were performed using minimally invasive approaches.

**Results.** The ICU stay was approximately 2.5 days, the hospitalization stay was 6 days on average, no wound infection was registered and the mortality in hospital was under 1%.

**Conclusion.** During the last years, a considerably progress was made in the development of minimally invasive approaches for heart valve surgery with undeniable benefits and it has gained acceptance from both patients and surgeons.



## ENDOVASCULAR AORTIC REPAIR WITH MULTILAYER GRAFT FOR AORTIC DISSECTION – RESULTS FROM NEXTCARDIO

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**Background.** The multilayer flow modulator (MFM) has shown promising results in the treatment of complex aortic pathologies, especially when branch arteries are involved, including a few reported cases of dissection. We present our single center experience and results with this technique.

**Methods.** Patients with complex type A or B dissections were selected for MFM repair as per device indications of use and were followed prospectively.

**Results.** A total of 13 consecutive patients with aortic dissection, were treated with an MFM endoprosthesis in our institution. Two cases are illustrated in Figures 1 and 2 (left-preop, right-postop). Patient and procedure related data are shown in Table. Indications included: type B dissection (n=10), residual type B after type A surgical correction (n=2), and one acute type A after surgical correction requiring intervention for malperfusion. One patient required drainage for pericardial effusion and one had distal aortic and bilateral iliac thrombosis, due to femoral access complication which required urgent revascularization by axillary-femoral bypass.

There were early two reinterventions in the same patient, detailed above resulting in a reintervention free survival of 85% at 3 years. Initial procedural success was 100% with no branch occlusions during follow-up.

**Conclusion.** MFM endovascular grafts are a safe option in the treatment of complex aortic dissections, with low mortality and good procedural success. Further studies and longer follow-up are needed to establish the role of MFM devices in the management of aortic dissection.

## CARDIAC TUMORS. SINGLE CENTER EXPERIENCE

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**Background and aims.** The objective of this study was to present the experience of a tertiary Romanian hospital with different types of cardiac tumors, their clinical presentation, diagnosis, surgical procedures, and early postoperative complications and mortality.

**Methods.** A number of 98 patients underwent surgical procedures for cardiac tumors in our clinic between November 1991 and December 2016. The study was observational, and the collected data was retrospectively analyzed.

**Results.** Cardiac tumors were more frequent in women (66.33%), and the patients' mean age was  $53.96 \pm 15.98$  years (range: 4 – 89 years). The presenting symptoms were variable, with shortness of breath accounting for the majority of cases (58 of 98 patients). The most frequent tumor was atrial myxoma (84.7%), followed by papillary fibroelastoma (7.14%), angiosarcomas (5.10%), and secondary tumors (3.06%). Surgical intervention consisted mainly in tumor resection, but in 29 cases some additional procedures (coronary artery bypass graft, atrial septal defect closure, mitral valve replacement, tricuspid valvuloplasty) were necessary. Postoperative complications were present in 9 patients, with atrial fibrillation as the most common (5 of 98 patients). Early postoperative death occurred in 12.24% of cases. There was no evidence of incomplete tumor resection in postoperative follow-up echocardiograms.

**Conclusion.** Benign cardiac tumors like atrial myxomas and fibroelastomas are curable with complete surgical removal, whilst in angiosarcomas and metastatic cardiac tumors the prognosis is very poor, the surgical management being only palliative.

**Keywords:** cardiac tumor, tumor resection, complications, early mortality

## TRANSESOPHAGEAL ECHOCARDIOGRAPHY (TOE) FOR ATRIAL FIBRILLATION ABLATION

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**Materials and methods.** A more accurate imaging exam for detecting left atrial thrombosis, especially located in the left atrium's appendix, is the transesophageal echocardiography, with a sensitivity of 92% and a specificity of 98%.

**Results.** It can also provide a morphological and hemodynamic description of the appendix, by observing its shape and by measuring the Doppler pulsed wave flow velocity. A low flow velocity is a risk factor for thrombus formation and, as a consequence, for cardioembolic events.

**Conclusions.** Therefore, preprocedural examination by transesophageal echocardiography is recommended in all patients with atrial fibrillation submitted to ablation therapy not only for ruling out left atrial thrombosis, but also for describing the interatrial septum's integrity.

**Keywords:** transesophageal echocardiography, atrial fibrillation ablation

## LEFT ATRIAL RECONSTRUCTION USING THREE DIMENSIONAL MAPPING SYSTEMS

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**Materials and methods.** From 2011 to 2017 we performed catheter ablation for atrial fibrillation ablation in 113 patients and for atrial tachyarrhythmia/flutter in 54 patients using the three-dimensional mapping system NAVX (Saint Jude) or Carto 3 (Biosense Webster). Before catheter ablation all patients had a transesophageal echocardiography and cardiac computed tomography (CT). Cardiac CT images were integrated in the electroanatomical mapping system and the left atrium and pulmonary veins were reconstructed with the ablation or Lasso catheter.

**Results.** Using imaging integration technique we segment the left atrium from the other heart chambers and also the pulmonary veins from pulmonary arterial branches. The reconstruction of the left atrium permits a better contact of the ablation catheter with the antrum of the pulmonary veins and an effective application of radiofrequency energy. The most important issue is that this highly technological approach results in an improvement of the procedure parameters: X-ray exposure, procedural duration and RF time, as well as the clinical outcome.

**Conclusions.** Image integration technology permits three-dimensional reconstruction of the left atrium and pulmonary veins and during complex procedures like atrial fibrillation ablation improves the quality of ablation and reduce the complication rates.

**Keywords:** catheter ablation, atrial fibrillation, Carto 3, NAVX.

## CATHETER ABLATION IN CHILDREN

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**Materials and methods.** Twenty-eight children underwent catheter ablation between 2014 and 2018 in the Electrophysiology Laboratory of the Cardiology Department-Rehabilitation Hospital Cluj-Napoca. The mean age was 14 years old and 50% of them had an accessory pathway. We switched from radiosopic guidance to three-dimensional mapping systems to avoid X-ray exposure.

**Results.** Electrophysiological procedures were performed under fluoroscopic guidance using the Siemens angiograph. For the electro-anatomical mapping we used the Ensite NAVX Saint Jude Cardiac Mapping System. Fluoroscopic catheter ablation in pediatric patients exposes the patient to the potential risk of radiation considering the sensitivity of children and the longer life expectancy. In our center the fluoroscopy time is 35 +/-15 minutes. With three dimensional mapping systems the fluoroscopy time can be reduced to 8 minutes or close to zero.

**Conclusions.** Reduction in the radiation exposure in an electrophysiology procedure, should be considered. The decrease in radiation exposure is expected to improve the benefit of the procedure for the patient and also to minimize the radiation for the medical staff. Three-dimensional mapping systems allow a safer and more effective ablation procedure in the pediatric population.

**Keywords:** catheter ablation, pediatric, X-ray, Carto, NAVX

## RADIOFREQUENCY CATHETER ABLATION OF IDIOPATHIC VENTRICULAR ARRHYTHMIAS

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**Objectives.** Idiopathic ventricular arrhythmias (VA) consist of various subtypes of VA that occur in the absence of clinically apparent structural heart disease. Affected patients account for approximately 10% of all patients referred for evaluation of ventricular tachycardia. When highly symptomatic and refractory to antiarrhythmic therapy or causative for ventricular dysfunction, ablation is a recommended treatment with a high success rate and a low risk of complications

**Materials and methods.** Patients usually present in their second to fifth decade [14] with symptomatic palpitations. Presyncope and light-headedness may be observed, but true syncope is infrequent (<10%). Although the arrhythmia may be sustained, it is usually characterized by repetitive bursts of nonsustained VT or frequent PVCs. In general, tachycardia from the OT shows a benign course. However, it has been reported that frequent PVCs and VTs can cause left ventricular (LV) dysfunction that can be reversed by suppression of VA with antiarrhythmic agents or radiofrequency catheter ablation. We describe the experience of the Electrophysiology Laboratory from the Cardiology Department-Rehabilitation Hospital in the catheter ablation of premature ventricular contractions.

**Results.** Ablation based on activation mapping and/or pace-mapping is considered the favored technique for eliminating idiopathic VT/PVC. The use of a three-dimensional electroanatomical systems can assist in relating the anatomy to the mapping data and may facilitate mapping and ablation. The acute success rate for ablation ranges from 75 to 100% with a low recurrence rate of 5%.

**Conclusions.** Idiopathic VA occurs in individuals with no structural disease and predominantly originate from the RVOT. RF catheter ablation of RVOT-VT is a safe treatment option with an acute success > 90% and a low risk of complications, and could be considered first-line therapy in selected patients.

**Keywords:** idiopathic ventricular arrhythmias (VA), antiarrhythmic therapy, ablation therapy, three-dimensional electroanatomical systems

## COMPLEX ATRIAL ARRHYTHMIAS AFTER ATRIAL FIBRILLATION ABLATION

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**Objectives.** To describe atrial arrhythmias that appear during and after atrial fibrillation ablation

**Materials and methods.** We describe the Rehabilitation Hospital's experience in complex atrial arrhythmia ablation in patients who performed AF ablation in our EP lab. Five case studies will be presented with different approaches in function of the mechanism of the arrhythmia.

**Results.** Atrial arrhythmias that appear after atrial fibrillation ablation are macroreentrant atrial tachycardia, localized reentrant atrial tachycardia, pulmonary vein tachycardia and genuine focal tachycardia.

**Conclusions.** It is important to realize a 3D mapping of any stable tachycardia, to check pulmonary vein disconnection, to use entrainment with PPI measurement.

**Keywords:** atrial tachycardia, fibrillation, ablation

## LEFT VENTRICULAR REMODELING AFTER ACUTE MYOCARDIAL INFARCTION

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Microvascular obstruction (MVO) during acute ST-segment elevation myocardial infarction (STEMI) is of the utmost importance since it frequently occurs even after timely culprit artery revascularization. Infarct size and MVO are important determinants in the evolution of patients with STEMI.

Regarding the intraprocedural embolism during PCI, when distal protection devices were used, like in EMERALD and DEDICATION trials, the results were disappointing.

None of the large thrombus aspiration studies and large recent meta-analyses had proven any benefit on MVO, left ventricular remodeling or long term survival.

The aim of this lecture is to present a new parameter in MVO evaluation and a new insight regarding the time of MVO occurrence. At the same time infarction size was determined. Left ventricular volumes and ejection fraction were determined at discharge and 5 years follow up.

We have shown that elevated CWP before interventional reperfusion influences the evolution of high-risk STEMI patients regarding left ventricular remodeling.

As recently stated by Mahmoud and Zijlstra, "thrombus aspiration is not the ultimate solution for myocardial reperfusion in STEMI, because distal embolization and microvascular obstruction might already have occurred to some extent before admission".



## THROMBUS ASPIRATION FOR THE TREATMENT OF ACUTE ISCHEMIC STROKE

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According to the World Health Organization, 15 million people suffer a stroke worldwide each year. In developed countries, the incidence of stroke is declining, largely due to efforts to lower blood pressure and reduce smoking. However, the overall rate of stroke remains high due to the aging of the population. Approximately 85% of all strokes are due to ischemia.

There has been an important change in acute ischemic stroke care since the approval of intravenous tissue plasminogen activator (tPA) based on the results of the NINDS trial. In recent years, endovascular treatment for acute ischemic stroke is being increasingly employed, especially if the 3 hour traditional time window for treatment has been exceeded or the patient is ineligible for pharmacological thrombolysis. Moreover, thrombus within large vessels is resistant to dissolution when tPA is delivered intravenously. Intra-arterial clot thrombolysis improves clinical outcomes for middle cerebral artery occlusions but may be less effective for carotid terminus or basilar artery occlusions.

As a result, several mechanical thrombectomy devices have been designed with the purpose of improving recanalization rates. Endovascular revascularization enables mechanical clot disruption or extraction in combination with locally directed pharmacological thrombolysis.

Unlike clot disruption, endovascular clot removal leads to rapid revascularization. In 2015, The American Heart Association/American Stroke Association issued updated guidelines for the emergency treatment of patients with acute ischemic stroke, recommending endovascular treatment using the newer generation stent retrievers that combine the ability to restore blood flow and retrieve clot.

Reported recanalization rates are high. However, although emerging as the most promising therapy in acute ischemic stroke, the risk-benefit ratio of mechanical reperfusion remains to be tested in large clinical trials.

## STEMI TREATMENT IN THE NORTH WEST OF ROMANIA: PRIMARY PCI OR PHARMACO – INVASIVE STRATEGY?

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**Objectives.** Primary PCI performance in the first 120 minutes by an experienced team is superior to in-hospital fibrinolytic therapy. In Romania significant delays may occur with consequent rise of STEMI national mortality around 10% as it shown in recent RO -STEMI snapshot report (2016). Emergency County Hospital Baia Mare provides interventional treatment of acute myocardial infarction (AMI), for approximately 500.000 inhabitants from the counties of Maramureş and Satu-Mare in the North-Western area of Romania. This area is characterized by roads partially upgraded and reduced number of specially equipped ambulances.

**Objectives.** To describe intra-hospital cardiac mortality in STEMI patients in whom primary PCI was performed in our center

**Materials and methods.** Methods: retrospective study of 310 medical records of STEMI patients in whom primary PCI was performed during 2016.

**Results.** 153 (49.35%) of 310 patients were transferred from Satu Mare region. PCI in transferred patients was performed after a median time of 418 minutes (~7hours) after the first medical contact. Only 27 (17.60%) of the transferred patients had have PCI in the first 180 minutes and none in the first 120 minutes. Pharmacoinvasive approach was performed in 34 patients (10.76% from total) in most cases with fibrinolysis at Satu Mare Hospital – 29 patients (18.95% from the transferred patients) and 5 in ambulances. Lytic therapy was administered after a median time of 154 minutes (2.54 hours). Cardiac mortality was 2.94 % between pharmacoinvasive patients and 7.24% for the others (6.77% - global intra hospital). Mortality of patients reperfused by PCI or lytic therapy in the first 3 hours was 1.29% in comparison with 5.48% of those reperfused later.

**Conclusions.** The lowest in-hospital cardiac mortality was in pharmacoinvasive treated patients. A large scale of pharmacoinvasive approach could lead to an important decrease of the in-hospital cardiac mortality in the North West of Romania because of the delay seen in the time to perform primary PCI. Reperfusion, whether induced pharmacologically or mechanically exhibit a mortality advantage when performed less than 180 min after first medical contact.

**Keywords:** STEMI, primary PCI, pharmacoinvasive strategy, cardiac mortality

## DIAGNOSTIC AND MANAGEMENT OF CARDIOGENIC SHOCK

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Cardiogenic shock represents a hemodynamic condition defined by decreased cardiac output and evidence of systemic hypoperfusion, in the presence of adequate intravascular volume. At the heart level, cardiogenic shock is characterized by high preload and low afterload. The systemic consequences include arterial hypotension and inadequate tissue perfusion. Cardiac conditions that can deteriorate into cardiogenic shock include: acute myocardial infarction and its mechanical complications, right ventricle infarction, acute heart failure, acute myocarditis, severe valvular disease (severe aortic stenosis, severe aortic or mitral regurgitation, prosthesisthrombosis or dehiscence), hemodynamically significant arrhythmias (ventricular fibrillation, ventricular tachycardia, complete heart block), atrial myxoma, myocardial rupture, aortic dissection with coronary involvement or tamponade, acute pulmonary embolism. Cardiogenic shock diagnosis and its cause is based on signs and symptoms, physical examination findings, non-invasive measurements (blood pressure, ventricular rate, electrocardiogram), echocardiographic evaluation (dimensions, systolic and diastolic function of the left and right ventricle, wall motion abnormalities and myocardial integrity, Doppler assessment of the valves or prosthesis, arterial impact of low cardiac output and venous return). If needed, patients with cardiogenic shock can be diagnosed and monitored using cardiac catheterization or bedside hemodynamics in cardiac care units. Treatment of cardiogenic shock starts with the correction of hemodynamic and acid-base disturbances, followed by infusion of inotropes and/ or vasopressors, respiratory support, systemic (ECMO) or left ventricular (Impella) assistance devices and urgent medical, percutaneous or surgical correction of the underlying cause.

**Keywords:** cardiogenic shock, arterial hypotension, tissue perfusion, hemodynamic support

## ECHOCARDIOGRAPHY IN STANFORD TYPE A AORTIC DISSECTION

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Aortic dissection is an emergency condition defined as disruption of the medial layer produced by intramural bleeding resulting in the separation of the aortic wall layers.

Stanford type A aortic dissection implies the ascending aorta with or without involvement of the aortic arch and descending aorta.

Transthoracic echocardiography (TTE) is the initial imaging investigation - IC class, followed by transoesophageal echocardiography (TOE) - IC class, or computed tomography - IC class, in unstable patients. For stable patients, computed tomography (CT) - IC class, magnetic resonance imaging (MRI) - IC class and TOE - IIaC class, are the suitable methods, according to the 2014 ESC Guidelines on the diagnosis and treatment of aortic diseases.

Sensitivity and specificity are 78% and 83% for TTE and ranges between 97-99% and 97-100% respectively for TOE in Stanford A aortic dissection. Diagnostic reliability for TOE is comparable with CT and MRI.

Echocardiography provides information regarding the aortic walls, intimal flap, extension of the disease, true and false lumens, entry and re-entry tears, aortic regurgitation, side branches, pericardial, pleural, peri-aortic and mediastinal bleeding, presence of intramural hematoma or penetrating aortic ulcer.

3D-echocardiography improves almost all diagnostic details.

Intravascular ultrasonography (IVUS) is used mainly in the descending aorta dissection, as it is extremely helpful for the correct interventional placement of the aortic graft during the thoracic endovascular aortic repair (TEVAR). It is also used for the visualization of the side-branches involvement (coronary, cervical, mesenteric and renal arteries) and for describing the responsible mechanism of malperfusion - false lumen extension or intimal flap prolapse.

Intraoperative TOE can be used directly after TTE examination in unstable patients with a diagnostic TTE, but also to verify the cannulation of the true lumen, the blood flow in the true lumen and to evaluate the surgery results.

## **TOOTHPASTE TUMOR – TO BE OR NOT TO BE OPERATED?**

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Mitral annular calcification (MAC) is a relative common echocardiographic finding. Caseous calcification of the mitral annulus (CCMA) is, on the other hand, a less known, rarely described variant, seen as a round mass with a central echolucent area composed of a mixture of fatty acids, cholesterol, and calcium.

We report two cases of caseous mitral and annular calcification (CMAC) diagnosed by transthoracic and confirmed by trans-esophageal echocardiogram (TEE) and MRI respectively. We stressed the importance of multimodality imaging in this condition because of the possible misdiagnoses; cases of confusion with abscesses, and cardiac tumors, thrombi and vegetations have been reported leading to inappropriate interventions. Normally it is a benign condition as in one of our cases followed during a five years period: we noted the involution of the tumor and the patient remained asymptomatic. The other patient with a recently diagnosed tooth paste tumor chose to have a surgical intervention

## HEART FAILURE WITH REDUCED EJECTION FRACTION – ROLE OF IMAGING MODALITIES IN THERAPY

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Heart failure is a clinical syndrome, with typical signs and symptoms resulting from an abnormal cardiac structure and/or function. Classically subdivided into two groups, it was recently reclassified according to the systolic function into three categories. The type with reduced ejection fraction has the highest prevalence due to the impact of aging population and increasing survival after acute cardiovascular events (myocardial infarction, pulmonary embolism).

However, cardiac imaging is essential not only for the diagnosis of heart failure with reduced ejection fraction, but also for its therapy. The variety of imaging modalities (either rest or stress) usually used in the daily clinics includes echocardiography, cardiac magnetic resonance, single-photon emission computed tomography, cardiac computed tomography and positron emission tomography. They allow characterization of cardiac structure and function, identifying specific etiologies involved in the development of heart failure, and offering the opportunity to address the underlying pathologies. Moreover, the selection of heart failure patients for particular non-pharmacological therapies, such as cardiac resynchronization therapy and implantation of either implantable cardioverter-defibrillator or ventricular assist device, requires specific imaging criteria to be met.

## CARDIAC RESYNCHRONIZATION THERAPY - OVER 12 YEARS OF EXPERIENCE

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Cardiac resynchronization therapy (CRT) is a method to treat NYHA III or IV heart failure patients, in either sinus rhythm or atrial fibrillation, with QRS width > 130ms, (LBBB morphology) and LVEF <35%, under optimal medical therapy. There are several echocardiographic parameters used to define both inter- and intra-ventricular dyssynchrony.

Possible difficulties met during the classic CRT implantation technique are:

- Venous approach difficulties;
- Difficult coronary sinus cannulation;
- Absence of an adequate postero-lateral vein or angulation /reduced caliber impeding the placement of the LV lead;
- Phrenic stimulation;
- Lead displacement at the time of the sheath.

In the Heart Institute Cluj-Napoca, the first CRT device was implanted in April 2005. To date, 214 devices (160 CRT-P and 54 CRT-D) were implanted, 194 patients being in sinus rhythm and 20 in atrial fibrillation.

Etiology: 56% ischemic, 33% nonischemic, 6% classic PM indication, 5% up-grading.

Criteria to assess the CRT efficacy are:

- 1 - clinical: - NYHA class improvement
  - increased walk distance during the 6-minutes walk test
- 2 – ECG: - decreased QRS width
- 3 – Echo: - improvement of the resynchronization parameters.

## TREATMENT OF DUCT DEPENDENT SYSTEMIC AND PULMONARY CIRCULATION

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The arterial duct is a key anatomical element in the normal development of the newborn cardio-respiratory system. During the embryonic period, the arterial duct directs blood from the high pressure circulatory system (pulmonary circulation) in the low-pressure descending aorta circulation. Thus, circulatory flow at this level represents 60% of the combined biventricular volume. At 12 hours postpartum, functional closure occurs by gradual lowering of the PGE1 concentration and an increase of PO2 concentration under the influence of muscle fiber contraction at this level. At 3 weeks, anatomical closure occurs, forming the arterial ligament.

Duct dependent systemic circulation is the pathological condition in which systemic blood flow obstruction at ductal level determines systemic circulation impairment; coarctation of the aorta, severe aortic stenosis, the interrupted aortic arch and the hypoplastic left heart syndrome correspond to this form. Ductal dependent pulmonary circulation is characterized by reduction of the pulmonary flow in case of reduction of arterial duct permeability; Clinical forms are tricuspid or pulmonary atresia, severe pulmonary stenosis, Tetralogy of Fallot with severe pulmonary stenosis. Between 2011 and 2016, 203 cases of patients with duct-dependent circulation were diagnosed and surgically treated at the Emergency Institute for Cardiovascular Diseases and Transplantation from Targu Mures. The diagnosis was certified in most cases by echocardiography, but angio-CT was also of great help in elucidating the complex anatomy. Arterial duct permeability was maintained with prostaglandin PGE 1 administration with echo and clinical monitoring of duct size and organic perfusion condition. Most procedures (82% -166p) were performed in the neonatal period, of wich majority required extracorporeal circulation (74% -150p).

The evolution was influenced by length of mechanical ventilation, inotropic support, inflammatory syndrome management, or multi-organ dysfunction. Prenatal diagnosis and a complex medical team for diagnosis and surgical treatment in optimal time, determines good results in this complex congenital heart diseases.



## CURRENT ANATOMICAL AND EMBRYOLOGICAL TRENDS IN THE SURGICAL APPROACH OF CONGENITAL HEART DISEASES

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**Introduction.** Cardiovascular development is a complex interplay of various cell–cell and cell–matrix interactions, anomalies in these processes developing into congenital heart diseases (CHD), heart and great vessel defects in the structure of the heart present at birth with a prevalence of 6-13/1000 in neonates.

**Materials and methods.** The aim of the current study is to investigate abnormal aspects of cardiac development in order to reveal the segmental approach in describing CHD based on the medical records of 558 patients aged 1 week - 54 years, diagnosed and surgically treated for CHD at the Cardiovascular Diseases Institute (Iasi, Romania) between 2005 – 2017. 102 pediatric patients were treated as part of the project „Training specialists in pediatric cardiology for a quality medical service to improve the quality of life” between April-December 2015.

**Results.** Out of the 558 patients, 234 presented with atrial septal defect (41.93%), 100 with ventricular septal defect (17.92%), 73 with patent ductus arteriosus (13.08%), 63 with aortic coarctation (11.29%), 46 with tetralogy of Fallot (8.24%), and 42 (7.51%) with complex anomalies. Concerning the 102 pediatric patients treated in 2015 and completely investigated with segmental classification, 8 cases (7.84%) had undergone prior palliative or interventional procedures, 8 cases (7.84%) benefited from palliative interventions (shunts, pulmonary artery banding, atrial septectomy) and the rest of 86 cases (84.32%) were corrected per primam. Unoperated cases consisted in complex CHD with irreversible pulmonary arterial hypertension and neonates with critical CHD. In 28 cases (20.59%) CHD were part of syndromes like Down, di George, Noonan, heterotaxy or Williams. The type of embryological defect and the segmental classification were further correlated with the presence of associated malformations and the result of the surgical treatment in terms of palliative versus corrective surgery, single step correction, number of surgical procedures and short term prognosis.

**Conclusions.** Close cooperation between cardiac surgeons, cardiologists, anesthesiologists, anatomists, embryologists, and pathologists is crucial for further increase of knowledge in the field of cardiac morphogenesis explaining cardiac defects. Segmental approach, although perfectible, could become an international language facilitating interdisciplinary communication.

**Keywords:** congenital heart diseases, cardiac development, segmental approach, cardiac surgery

PSYCHOLOGICAL DEVELOPMENT OF PATIENTS AFTER SURGICAL CORRECTION OF THE TETRALOGY OF FALLOT

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**Aim of study.** Cognitive outcome of surgically corrected patients with Tetralogy of Fallot could be affected by the preoperative chronic cerebral hypoxia.

**Patients and method.** This paper studies a group of 71 patients operated in Heart Institute between September 1st 2001 and July 1st 2006, all surgically corrected without prior palliations. The surgical techniques were: transannular patch (46), infundibular patch (12), infundibular patch + pulmonary artery patch (5), and transatrial and transpulmonary correction (8). The patients were divided into two groups, operated under 1 year of age and over 1 year of age, for comparative study of results. Among the 71 patients, 58 were followed up, performing a pediatric psychological evaluation.

**Results.** The effects of two major components on the patients' IQ were studied: preoperative chronic cerebral hypoxia and family environment. Major differences were noticed between the two groups, as follows: the patients IQ values were statistically significantly different in the two groups, there is an inverse ratio between IQ values at follow up and age at operation, there is an inverse ratio between IQ values and preoperative hematocrit, the IQ values distribution is slightly different between the two groups of age, the IQ values in patients operated above 1 year of age are significantly different depending on parents scholar degrees.

**Conclusions.** Delay in surgical correction, beyond 1 year of age, in patients with Tetralogy of Fallot, could have deleterious effects over cognitive outcome of these patients. The cognitive outcome also correlates with the parents' scholar degrees, in older patients.

## SOMETIMES LATER MAY BE TOO LATE – UNPREDICTABILITY OF PULMONARY HYPERTENSION IN TRISOMY 21

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**Introduction.** From the general classification of pulmonary hypertension, a relatively small place is held by pulmonary hypertension secondary to congenital heart diseases. There are a lot of hemodynamic situations where pulmonary vascular resistance is increased and plays an important role in the prognosis and quality of life in this patients.

From a group of one hundred newborns, almost one is born with a heart malformation. More than 90% of them reach adulthood, although 10-18% develop a degree of pulmonary hypertension.

From the complexity of systemic malformations, Trisomy 21 most commonly associates complete atrioventricular canal defect.

**Objectives.** Pulmonary hypertension developed secondary to cardiac malformations has a precocious evolution and is more frequent than those occurring in similar lesions, apart from a genetic condition.

**Material and method.** We present the case of a 3 years and 4 months old patient diagnosed at birth with Rastelli A subtype atrioventricular canal defect, that underwent late surgical correction (at age two, although the recommendation regarding surgical correction was given at age one), at which moment severe pulmonary hypertension had already installed.

**Results.** Postoperatively, progression was difficult, requiring prolonged oro-tracheal intubation, inotropic support and nitric oxide. The appearance of a total atrioventricular block required the implantation of a BIOTRONIC unicameral pacemaker.

Following the surgical total correction intervention, pulmonary hypertension had worsened, the patient exhibiting right ventricular dysfunction with cardiac decompensation and the onset of edematous syndrome. Specific treatment for pulmonary hypertension (Sildenafil and Bosentan) was instituted, the response being unfavorable, results presenting signs of untreatable cardiac failure.

With the establishment of maximum diuretic doses, vasodilator treatment and dietary plan, the clinical condition became stationary with a tendency towards slow recovery.

### **Conclusions:**

1. Lesions in pulmonary hypertension may be irregular;
2. After total surgical correction of cardiac malformation, pulmonary hypertension may regress.
3. Particular for this case was the postoperative severe cardiac decompensation giving the impression of the irreducibility of the disease.

**Keywords:** pulmonary hypertension, Trisomy 21, atrioventricular canal defect

## INFECTIVE ENDOCARDITIS IN CHILDREN WITH UNDERLYING CONGENITAL HEART DISEASE

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Infective endocarditis is a life threatening complication that may impair the prognosis of children with cardiac disease. Despite improvement in early diagnosis and treatment of endocarditis, the mortality of infective endocarditis remain significant, the mortality rate varies from 10-25%.

The incidence of infective endocarditis (IE) in patients with congenital heart disease (CHD) is higher than in general population; this is a major problem considering the continuous expansion of such group of patients. Generally the more complex is the congenital heart disease the higher is the risk of IE.

We present the clinical case of 2 children known with congenital cardiac malformation, not surgically corrected until the age of 9 and 11 years respectively, complicated with infectious acute endocarditis.

First case had a particularly good clinical evolution despite the fact that the etiological agent was *Staphylococcus aureus*, a well known aggressive and resistant bacteria. The second one posed serious clinical dilemma due to slow lingering evolution, negative hemoculture. Regardless of the various treatment regimens administrated, echocardiographic lesions were stable with slow amelioration of clinical symptoms and inflammatory parameters.

The present cases illustrate an unusual evolution of infective endocarditis and highlights the need for a carefully considered approach, based not only on the guidelines but also on assessment of the risks and benefits of surgical intervention, taking into account the patient's characteristics, clinical course, laboratory results and imaging studies, and duration of antibiotic therapy, in order to decide on the best therapeutic option.

**Keywords:** endocarditis, congenital heart disease, treatment

## EVOLUTION OF CARDIAC DISEASE IN CHILDREN WITH MUCOPOLYSACCHARIDOSIS

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**Introduction.** The prevalence and severity of cardiovascular disease in patients with mucopolysaccharidosis (MPS) is high and progressive, consisting in severe cardiac valve disease and ventricular hypertrophy. Enzyme replacement therapy in MPS may improve the organ impairment.

**Aim of study.** Was to characterize the cardiac results of enzyme replacement therapy in children with MPS.

**Material and methods.** We evaluated 20 patients (5 patients with MPS type I and 5 patients with MPS type II), aged 1-16 years.

**The** treatment of these patients consisted in weekly administration of recombinant form of human alpha-L-iduronidase in MPS type I and iduronate 2-sulfatase MPS type II. We assessed the function of the mitral and aortic valves, left ventricular chamber dimensions, septal and posterior wall thicknesses and ventricular at every 6 months after starting of treatment.

**Results.** At diagnosis, all patients presented echocardiographic alterations. In MPS type I, mitral valve thickening with variable grades of regurgitation was diagnosed in all patients, aortic regurgitation was present in 3 patients and mitral stenosis in one patient. Left ventricular hypertrophy was diagnosed in 3 patients. Mild pulmonary hypertension was present in 2 patients. The treatment results in stable disease in all patients. In MPS type II, mitral valve thickening with variable grades of regurgitation was diagnosed in all patients, aortic regurgitation was present in 9 patients and aortic stenosis in 2 patients. Left ventricular hypertrophy was diagnosed in 7 patients. Mild pulmonary hypertension was present in 4 patients. The treatment results on valvular heart disease were: stable disease in 8 patients, mild improvement in 2 patients and aggravation in 5 patients. Ventricular hypertrophy remained unmodified in 6 patients and worsened in one patient.

**Conclusions.** Enzyme replacement therapy had little effect on cardiac disease in children with MPS.

## THE IMPORTANCE OF GOOD QUALITY IMAGING IN ALCAPA

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One of the rare malformation, but with severe impact, is anomalous left coronary artery from the pulmonary artery (ALCAPA), due to inadequate myocardial perfusion and myocardial ischemia. Consequently, left ventricular dysfunction, significant mitral valve insufficiency, congestive heart failure, myocardial infarction occur. We present the case of an infant admitted at the age of 4 months to our clinic with dilated cardiomyopathy and mitral regurgitation. The poor quality echocardiography at that time, and lack of possibility of performing Angio-CT, conducted us to the wrong diagnosis of cardiomyopathy of genetic cause. The follow-up was difficult, but favorable with an improvement of signs of heart failure, decrease in dimensions of the left ventricle. The next presentation in our clinic was only at 13 years of age, because of chest pain at exertion. The left ventricle had normal dimensions with normal function, but a dilated right coronary artery was detected. An angio-CT of the coronary arteries enabled us this time the right diagnosis of ALCAPA of adult type, and the adolescent had a reimplantation of the left coronary artery and an uneventful recovery.

**Conclusions.** We want to highlight the importance of good quality imaging in such heart defects, where anatomic details can be documented only by fine imaging methods.

## RETROSPECTIVE STUDY OF CONGENITAL HEART DISEASES IN “DOMINIC STANCA” CLINICAL HOSPITAL ON A FIVE-YEAR PERIOD

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The incidence of congenital heart diseases in neonate is 8%. The congenital heart diseases can be isolated or associated with other malformations or in some diseases (chromosomal anomalies – Down, Turner, Marfan syndrome, maternal mellitus, TORCH infections, radiations, drugs). The most frequent are: ventricular septal defects, transposition of great arteries, tetralogy of Fallot, coarctation of aorta. Despite significant advances in prenatal diagnosis of fetal cardiac defects, most congenital heart diseases remain undetected until after birth. Well over one third of cases occur in pregnancies not otherwise identified as high risk. False – positive findings are also possible and they often involve coarctation of the aorta or small ventricular septal defects. From this results the importance of the antenatal and also postnatal echocardiography in neonates with suspected cardiac defects. In this setting we wanted to evaluate antenatal and postnatal diagnosis, correlation with other anomalies and immediate prognosis of congenital heart diseases in the Neonatal Department of “Dominic Stanca” Clinical Hospital Cluj-Napoca. We conducted a retrospective study on a 5-year period.

**Keywords:** congenital heart disease, echocardiography.

## **NUTRITIONAL APPROACH OF THE INFANT WITH CONGENITAL HEART DISEASE (CHD)**

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The nutritional status of the newborn child and of the infant with CHD is linked to the type of cardiac defect, the severity of the hemodynamic disturbances, the moment of surgical correction of the cardiac defect. Growth of these children is affected from the first trimester of life. Malnutrition is considered to be a regular systemic consequence of CHDs with multiple causes: greater energetic expenditure, greater respiratory effort, malabsorption, reduced spontaneous intake, difficulties in feeding (breastfeeding and deglutition disturbances, gastroesophageal reflux), associated anomalies.

Screening of nutritional risk identifies at an early stage infants with feeding difficulties or malnutrition and allows duly establishment of an effective nutritional intervention.

These patients frequently require enteral or parenteral nutritional support, as well as strategies for enriching the protein-calorie ratio in order to prevent or treat malnutrition before and after surgery.



## PULMONARY HYPERTENSION ASSOCIATED TO CONGENITAL HEART DISEASES

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Pulmonary hypertension (PH) represents a hemodynamic condition characterized by the elevation in the mean pulmonary arterial pressure and pulmonary vascular resistance that can lead to right ventricle failure. It is usually associated with an underlying cardiac, pulmonary or systemic disease. Pulmonary hypertension associated with left heart diseases occur in left sided atrial, ventricular or valvular heart disease. The pathogenesis of PH recognizes an elevated pulmonary vascular resistance resulting from an imbalance between local produced vasodilators (nitric oxide and prostacyclin) and vasoconstrictors (endothelin and thromboxane), in addition to vascular wall remodeling. The clinical manifestations of pediatric PH are nonspecific, producing delays in diagnosis. Echocardiography is a useful and sensitive tool to identify the associated congenital heart diseases and to assess the left and right ventricular function. In older children the six-minute walk test analyzes exercise tolerance and correlates with WHO functional class. Cardiac catheterization remains the diagnostic gold standard for PH. The PH severity is close related to prognosis, reinforcing the need for an early diagnosis and treatment. Currently therapies for PH are based on the metabolic pathways of the mediators. Prevention of pediatric pulmonary hypertension remains a priority. Children with congenital heart defects secondary to a left to right shunt lesion should undergo early surgery to prevent the development of pulmonary vascular disease. Current guidelines state that the choice of therapy should be based on WHO functional class and response to vasodilator testing during cardiac catheterization. Combination therapies have been accepted. Children with Eisenmenger syndrome have to be evaluated to ensure that the cardiac diagnosis is correct and complete and that surgery is not feasible. In conclusion, an early diagnosis and prompt surgery for children with congenital heart diseases is crucial to avoid secondary PH.

**Keywords:** pulmonary hypertension, congenital heart disease, child.

## CHALLENGES OF DISTAL BYPASS SURGERY IN PATIENTS WITH DIABETES

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**Introduction.** Diabetes mellitus is a multisystemic disease, a widespread pathology worldwide, and its incidence is estimated to increase in the coming years. Its complications such as atherosclerosis, neuropathy, retinopathy or nephropathy are the main causes of mortality and morbidity of this disorder.

The purpose of this study is to evaluate the importance of the main methods of medical and surgical treatment in chronic and / or critical lower limb ischemia in patients with diabetes.

**Material and methods.** This study was performed on a consecutive series of 63 patients with lower limb ischaemia, in Fontaine III and IV class. Distal revascularization procedures, but also associations with endovascular procedures have been performed. The results were evaluated in the short and medium term.

**Results.** Favorable post-treatment results were obtained in 76% of patients, where the trophic lesions were healed and the bypass was functional. The death rate was 2.5%. The internal saphenous vein constituted prosthetic elective material for distal revascularization.

**Conclusions.** Distal arterial revascularization is the method of choice in diabetic lower limb ischemia, with the best results in healing ulcerative lesions and decreasing amputation rates.

**Keywords:** distal arterial bypass, diabetes mellitus, lower limb ischemia

## PERIPHERAL ARTERIAL DISEASE AND DIABETES MELLITUS – THE EXPERIENCE OF VASCULAR SURGERY DEPARTMENT

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Peripheral arterial disease (PAD) is a condition characterized by atherosclerotic occlusive disease of the lower extremities. While PAD is a major risk factor for lower-extremity amputation, it is also accompanied by a high likelihood for symptomatic cardiovascular and cerebrovascular disease [1].

Diabetes mellitus (DM) is a major risk factor of peripheral artery disease (PAD), leading to increased morbidity and mortality as well as an accelerated disease course. As such, a more thorough understanding of the multi-factorial mechanisms underlying disease etiology for both DM and PAD is justified [2].

There are 415 million people with diabetes in the world and the worldwide burden is projected to increase to 642 million people by 2040 [4]. In Romania, according to PREDATOR Study, the overall age- and sex-adjusted prevalence of DM was 11.6%, of which 2.4% had unknown DM [5].

Total PAD disease prevalence based on objective testing has been evaluated in several epidemiologic studies and is in the range of 3% to 10%, increasing to 15% to 20% in persons over 70 years [3].

Although much is known regarding PAD in the general population, the assessment and management of PAD in those with diabetes is less clear and poses some special issues. At present, there are no established guidelines regarding the care of patients with both diabetes and PAD [1].

This lecture will present our findings from a clinical review that was conducted in diabetic patients diagnosed with PAD, treated in Department of Vascular Surgery, Institute of Cardiovascular Diseases “Prof. Dr. C. C. Iliescu” over a 5-year period. (January 1st, 2012 to December 31, 2016).

## AAA – ACTUAL STRATEGY AND FOLLOW UP

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**Purpose.** To assess the short and medium term safety and efficacy of endovascular abdominal aortic aneurysms repair (EVAR) in high-risk patients.

By helping patients avoid abdominal surgery, EVAR minimizes the perioperative impairment of cardiac, pulmonary, renal and gastrointestinal functions. The greatest potential benefit is in high-risk patients who have large aneurysms and who are poorly suited to any of the current surgical alternatives.

**Material and method.** We report the results of 55 elective EVAR (endovascular abdominal aortic repair) procedures performed in two vascular surgical centers in Romania and Germany. The mean follow up was 18 months with CT-scan, duplex ultrasound and contrast-enhanced ultrasound

**Results.** The prosthesis used were 16 E-vita Abdominal XT, 12 Excluder, 8 Talent, 7 PowerLink, 3 Endurant and 9 custom made fenestrated or branched from Jotec. Primary-assisted technical success rate was 100%. There was 1 non AAA-related late death. Conversion to open repair was performed in 1 case, as a late conversion for a type III endoleak (at 15 months after EVAR) with aneurysm sac enlargement >8mm.

**Conclusion.** These results show that in the modern era of abdominal aortic aneurysm treatment EVAR is safe and effective in high-risk patients, at least during the short to intermediate term.

**Keywords:** endovascular therapy, aortic stent graft, minimally invasive surgery

## THE ENDOVASCULAR MANAGEMENT OF BELOW-THE-KNEE ARTERIAL DISEASE - SALVAGE THERAPY FOR THE DIABETIC FOOT

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Revascularization in peripheral artery disease (PAD) of the lower limb is a major medical concern, leading to important clinical benefits for the patient.

The surgical therapy is limited by the patient's overall condition, comorbidities, vascular caliber and the lesions' extent, especially regarding below the knee vessels.

Interventional radiology (IR) brings a new approach in the lower limb revascularization treatment, using minimally invasive techniques.

Peripheral artery disease of the lower limb is a major concern of IR, due to its high incidence and detrimental prognosis without treatment.

Vascular surgery is mostly restricted to larger vessels, this is the reason why IR, also known as endovascular surgery, gains more and more ground in the management of below-the-knee lesions in PAD.

The anatomy, caliber and lesion types of the below-the-knee vessels limit the vascular surgical act, thus leading to radical gestures, such as amputation.

Progresses made by the endovascular industry in developing low profile devices specially tailored for small vessels and their lesions are giving us the possibility to restore blood flow and salvage diabetic or extensively atherosclerotic lower limbs.

Our continuous interest for IR peripheral vascular techniques (15 years in retrospect), interdisciplinary collaboration, along with the increasing number of patients with below-the-knee lesions, have created the framework for major progress in this field, therefore allowing us to develop the endovascular treatment of the diabetic foot.

**Keywords:** below-the-knee, diabetic foot, IR

## DIAGNOSTIC AND THERAPEUTIC CHALLENGES IN GERIATRIC PATIENTS WITH PULMONARY ARTERIAL HYPERTENSION

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**Objectives.** Pulmonary arterial hypertension (PAH) is quite frequently encountered in geriatric patients, representing a real challenge in the case of surgical interventions and also in considering therapeutic options in this category of population.

**Materials and methods.** We retrospectively studied 144 geriatric patients with pulmonary arterial hypertension, patients admitted in our geriatric department during 2016. These patients were evaluated clinically and also by cardiac Doppler echocardiography, in order to document the values of the pulmonary artery pressures.

**Results.** Pulmonary hypertension secondary to left heart disease with secondary venous pulmonary hypertension was the most frequently encountered (42.55% of PAH cases), followed by PAH secondary to chronic obstructive lung disease (29.81% of PAH cases), followed by chronic thrombo-embolic PAH (14.89% of PAH cases), followed by group 5 (other or mixed cases of PAH - 7.44% of PAH cases) and group 1 (5.31% of PAH cases). PAH was moderate in 48% of cases, mild in 30% and severe in 22% of cases. In geriatric patients with chronic obstructive lung disease, pulmonary arterial hypertension was severe in 30% of cases, moderate in 28% and mild in 22% of cases, whereas 20% of cases did not present pulmonary arterial hypertension. The severity of PAH did not correlate with the age of the patients, the proportion of mild, moderate and severe PAH being similar in persons over 65 years of age. We found a negative correlation between the values of the pulmonary artery pressures and the left ventricular ejection fraction, geriatric patients with more severe PAH having a tendency to lower ejection fractions. We also discuss some surgical risk factors in geriatric patients with PAH, different risk scores, main intra-surgical accidents which may occur in these patients and also strategies to lower surgical risk.

**Conclusions.** In our present study, PAH was encountered quite often in geriatric patients, pulmonary hypertension secondary to left heart disease being the most frequently encountered (42.55% of PAH cases), followed by PAH secondary to chronic obstructive lung disease (29.81% of PAH cases), followed by chronic thrombo-embolic PAH (14.89% of PAH cases). Group 5 (other or mixed cases of PAH - 7.44% of PAH cases) and group 1 (5.31% of PAH cases) represented a smaller proportion of cases.

**Keywords:** pulmonary arterial hypertension, geriatric patients

## ATHEROSCLEROTIC CORONARY DISEASE IN PATIENTS WITH END STAGE RENAL DISEASE TREATED WITH HEMODIALYSIS

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**Materials and methods.** 45 subjects with ESRD treated with chronic HD were assessed regarding risk profile, morphofunctional arterial characteristics, and presence of atherosclerotic coronary disease. Cardiovascular classic risk factors (age, male sex, body mass index, arterial hypertension, diabetes mellitus-DM, smoking, dyslipidemia) and HD related risk factors (HD vintage and high sensitive-C reactive protein) were determined. We also assessed morphofunctional arterial characteristics (carotid intima media thickness-IMT- and arterial stiffness through digital volume pulse-derived stiffness index-SIDVP- using photoplethysmography) in this population. Atherosclerotic coronary disease was considered when in medical history of the patient an acute coronary event has been demonstrated, or a previous coronarography has proven presence of coronary arterial disease.

**Results.** 27 women and 18 men, with a median age of  $56.6 \pm 14.5$  years, treated with chronic HD in our hospital were included. Among risk factors we identified arterial hypertension in 42 subjects, while DM and smoking only in 9 subjects each. The median body mass index corresponded to a mild overweight ( $26.6 \pm 5.46$  (kg/m<sup>2</sup>). Values of serum lipids levels were: total cholesterol  $169.1 \pm 42.5$  mg/dl, triglycerides  $183.5 \pm 119.3$  mg/dl, and HDL-cholesterol  $36.9 \pm 13.2$  mg/dl). HD vintage corresponded to  $57.4 \pm 51.7$  months, and a constant elevation of the level of inflammation was detected (high sensitive-C reactive protein  $2.34 \pm 2.02$  mg/dl). The median value of carotid intima-media thickness was  $0.77 \pm 0.15$  (mm). There was a high rate of arterial stiffening (33.3% rate of non-detectable stiff SIDVP values, while the determined median value was  $8.76 \pm 2.34$  m/s). Atherosclerotic coronary disease was identified in 15 patients (33.33%). Among risk factors, only age had statistical correlations with both arterial characteristics ( $p=0.0006$  for IMT,  $p=0.002$  for SIDVP). DM was correlated with arterial stiffening-SIDVP ( $p=0.03$ ). All the other assessed risk factors had no statistical correlations with either morphofunctional characteristics, or presence of atherosclerotic coronary disease. We found statistical correlation between carotid IMT and atherosclerotic coronary disease ( $p=0.0019$ ,  $r=0.52$ ), but not between arterial stiffness and atherosclerotic coronary disease ( $p=0.76$ ,  $r=0.05$  for SIDVP).

**Conclusions.** In our ESRD population treated with chronic HD, age and DM were risk factors associated with atherosclerotic coronary disease presence. For this population, carotid IMT proved to be an non-invasive arterial assessment tool correlated with the presence of atherosclerotic coronary disease.

**Keywords:** coronary artery disease, renal dialysis, intima media thickness, vascular stiffness

## THE IMPORTANCE OF INFLAMMATORY PROCESSES ON THE PROGRESSION AND PROGNOSIS OF PATIENTS WITH CALCIFIC AORTIC VALVE STENOSIS AND CORONARY ARTERY DISEASE

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**Objectives.** Incidence of calcific aortic valve stenosis (CAVS) has suffered a dramatic increase, becoming the third most frequent cardiovascular disease. In addition, an important proportion (40%) of patients with CAVS also has coronary artery disease (CAD). The evolution of the two diseases is often unpredictable, their progression to severe forms being partly due to the inflammatory processes that occur on the valvular and vascular level. The purpose of this paper is to evaluate the impact of inflammatory processes on the evolution and prognosis of patients associating CAVS and CAD.

**Materials and methods.** This paper is a review of literature data on inflammatory processes at the level of atheroma plaque and degenerate aortic valve in an attempt to find common elements that influence the evolution and prognosis of patients associating the two pathologies and practical methods of monitoring the intensity of inflammation.

**Results.** Inflammation is an important element in the occurrence, evolution and prognosis of patients diagnosed with CAVS and CAD. Elevated levels of inflammatory markers are associated with rapid evolution to severe forms of CVAS and CAD complications. Although they show common elements of the inflammatory cascade, these two diseases seem to have different inflammatory patterns, probably responsible for the ineffectiveness of statin treatment in CVAS. PCR is a marker of inflammation, usable for both pathologies. The lack of a medication capable of influencing the evolution of CVAS leads to an increased need for valvular prosthesis surgery, which alters the management of CAD patients. The association of the two pathologies worsens the patient's prognosis by increasing intra-operative mortality and postoperative complications.

**Conclusions.** Inflammation is an important pathogenetic link for both CVAS and CAD, but the substrate is different for the two pathologies. The intensity of inflammation (monitored by hs-CRP) correlates with the rapid evolution of disease to severe forms, with the prognosis of patients being worsened when associating these two pathologies.

**Keywords:** aortic valve stenosis, coronary artery disease, inflammation, prognosis



## USE OF COMPUTED-TOMOGRAPHY THE DIAGNOSIS OF ISCHAEMIC CARDIOPATHY

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**Objectives.** The utilisation of Computed-Tomography (CT), particularly of the CT-coronarography, and of the calcium-score, in the diagnosis of obstructive coronary lesions continued to be intensively studied. CT-coronarography represents the main indication of a cardio-CT examination. The general indications of the CT-coronarography are represented by detection of the calcified atheroma plaques, detection and quantification of the coronary stenosis, the post-CABG follow-up.

**Materials and methods.** We made an analysis of several studies which had compared the using of CT-coronarography with functional testes of ischaemia (in classic algorithms).

**Results.** The using of CT-coronarography (in the SCOT-HEART british study) has favorised a better therapeutical attitude, with a proper indication for coronarography and an earlier starting of the preventory therapy in more patiens , with the disadvantage of a slight rise of the costs . In the PROMISE study , the patients to whom has been used angio-CT have had significantly less coronarographies without pathological lesions than those to whom have been used functional testes. The role of CT at the patients wich were presenting at Emergency Rooms with chest angina is that it can detect which patient with low or medium cardio-vascular risk can be discharged (in accordance with a multicentric american study), and the risk of major cardiac events (in 1-year follow-up) was less than 1% in patients with negative angio-CT.

A Danish study also pointed out that the presence of angio CT-scan detected coronary calcifications (without contrast substance) at middle-aged patients which had not been diagnosed with ischaemic cardiopathy before, was asociated with a rise of the high-sensitive I-Troponin.

**Conclusions.** The role of CT in diagnosis of ischaemic cardiopathy is to underline the presence of coronary atherosclerosis by the means of two technics: CT-coronarography and the cuantification of coronary calcifications. Although it is inferior to the classic coronarograph, angio-CT permits the distribution of the patients suspected of CI into those with and without atherosclerotic lesions - severe or unsignified -, and the treatment of the last ones with suitable therapy.

**Keywords:** CT-coronarography, ischaemic cardiopathy, angina, coronary calcifications

## INTERVENTIONAL CARDIOLOGY FOR ALL

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**Objectives.** Interventional cardiology that treats several pathologic cardiac conditions is one of the best cost effective options. Unrestricted access to these facilities establish a high standard of health care.

**Materials and methods.** Presenting the evolution to a complete system of cardiology care that offers in term of fairness and equal access for all the population of our county and neighbours.

**Results.** Reducing cardiovascular mortality and improving quality of life for our target population by using high-tech interventional cardiology methods and facilities.

**Conclusions.** A patient centered health system applying best science achievement is desirable for all.

**Keywords:** inteventional cardiology, standards of care, reducing mortality, improving quality of life

## A 3.5 YEARS OBSERVATIONAL FOLLOW-UP STUDY OF PATIENTS WITH CRITICAL LIMB ISCHAEMIA TREATED EFFICIENTLY BY ENDOVASCULAR APPROACH

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**Objectives.** Recent data in literature demonstrated a continuous increase in peripheral artery disease burden and also an increase of the proportion of critical limb ischaemia, the most severe clinical manifestation, with significant impact on amputation rates, cardiovascular morbidity and mortality. Despite changes in awareness and detection, substantial progress in medication and technical devices, continuously increasing number of revascularizations knowledge about the prognosis and optimal treatment of critical limb ischaemia is very limited. The aim of this study was to describe our experience with endovascular treatment in critical limb ischaemia and to bring new follow-up data about these patients with initial successfully revascularization.

**Materials and methods.** A retrospective study of 115 patients with critical limb ischaemia, with successful endovascular treatment in our institution was performed.

**Results.** We followed mortality, reintervention and amputation rates during a mean period of  $43.2 \pm 7.9$  months. Follow up was made through referring physician, general practitioners or by phone call. The mean age of the patients was  $65.4 \pm 11.6$  years. Of these patients, 70.4% were males, 39.1% diabetics, 53% active smokers, 23.5% with chronic kidney disease, 34.8% with other peripheral artery disease. The final treatment was stenting in 20.8% of cases and balloon angioplasty alone in the rest of the cases. Treated arteries were in the femoral-popliteal segment – 55.4%, aorto-iliac segment – 30.2% and infrapopliteal segment – 14.4%. 23.7% of the patients underwent procedures on more than one arterial segment. More than 85% of lesions were type A and B (TASC II classification) in both aorto-iliac and femoral-popliteal segment. The most frequent arterial approaches used were antegrade femoral – 50.3%, left brachial artery – 20.1%, retrograde femoral – 9.3%. 6.9% patients required more than one access site. During follow up one death occurred (0.9%), 17 patients (14.8%) underwent reinterventions for revascularization (endovascular or surgical) and 18 patients (15.7%) suffered further amputations.

**Conclusions.** Despite a certain rate of death, amputation and reintervention, our results suggest that endovascular approach, can be considered an efficient and feasible treatment option for patients with critical limb ischaemia if successfully at the moment of implementation.

**Keywords:** critical limb ischemia, obliterating chronic arteriopathy of the lower limbs, endovascular revascularization

## THE ASSESSMENT AND TREATMENT OF THE PATIENT WITH SEVERE ACUTE CARDIAC DISEASE

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**Objectives.** Insufficient Acute Cardiac (ICA) represents a life-threatening situation which requires immediate medical care and hospitalization. The most of the times the ICA appears as a result of a damage on the patients with a previous diagnosis of the shortage of heart rate (IC) but can also be the first presentation of IC.

The onset of the escalation may vary, some of the patients are presenting a period of days or even weeks of damage (e.g. the aggravation of the shortness of breath or edema), while the other patients may develop IC in hours or even minutes (e.g. in conjunction with an myocardial infarction or other diseases). There are a variety of clinical aspects developed on these patients starting from life threatening pulmonary edema or cardiogenic shock to a clinical picture characterized predominantly to the aggravation of the peripheral edema. The diagnosis should be quick set, while the treatment must be promptly. First of all the goal is the improvement of the symptoms and the stabilization of the patient's hemodynamic state and subsequently, a very important step is the long term management to prevent the recurrence and to improve the prognostic.

The purpose of this presentation is the awareness of the risk of a ICA even by the nurses (the most of the times they come in contact with the patient first, before the announcement of the physician) as well as the quick recognition and the prompt initiation of the ICA management.

**Materials and methods.** The review of the ICA guides and the articles in the field.

**Conclusions.** The well being of the patient is the most important thing, but the survival and the improvement of the patient's quality of life depends on each of us the medical staff, the level of training, the interest in the patients and the work carried out (we shouldn't dismiss that, in any moment we or the people close to us can become the patients) and the correct and prompt management of the cases.

**Keywords:** acute cardiac insufficiency, acute pulmonary edema, cardiogenic shock

## ST-SEGMENT ELEVATION ACUTE MYOCARDIAL INFARCTION (STEMI)

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The term ‘acute myocardial infarction’ (AMI) should be used when there is evidence of myocardial necrosis in a clinical setting consistent with myocardial ischaemia as a consequence of an acute interruption of blood flow in a coronary artery [1]. STEMI usually develops by formation of an occlusive thrombus in a major coronary artery previously affected by atherosclerosis.

Both diagnosis and treatment of AMI starts at the point of first medical contact (FMC), based on chest pain lasting at least 20 min and typical ECG findings like persistent ST-segment [2].

Timely diagnosis of STEMI is key to successful management. In acute settings, for patients with STEMI within 12 h of symptom onset and with persistent ST-segment elevation, early percutaneous coronary intervention (primary PCI) or pharmacological reperfusion represent the appropriate therapeutic strategy as early as possible [3].

Primary PCI defined as an emergent percutaneous intervention of is the preferred reperfusion strategy in patients with STEMI, performed by an experienced team in a PCI-capable hospital. An experienced team includes not only interventional cardiologists, but also skilled support staff. This means that only hospitals with an established interventional cardiology programme should use primary PCI as a routine treatment. Lower procedural mortality rates are observed in high volume centres of PCI.

Primary PCI is the best option in reestablishing coronary artery patency also ameliorating infarct size and long term morbidity and mortality.

## NSTE-ACS TREATMENT

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The leading symptom that initiates the diagnostic and therapeutic cascade in patients with suspected acute coronary syndromes (ACS) is chest pain. Based on the electrocardiogram (ECG), two groups of patients should be differentiated: The clinical spectrum of non-ST-elevation ACS (NSTEMI) may range from patients free of symptoms at presentation to individuals with ongoing ischaemia, electrical or haemodynamic instability or cardiac arrest. The pathological correlate at the myocardial level is cardiomyocyte necrosis [NSTEMI-myocardial infarction (NSTEMI)] or, less frequently, myocardial ischaemia without cell loss (unstable angina). A small proportion of patients may present with ongoing myocardial ischaemia, characterized by one or more of the following: recurrent or ongoing chest pain, marked ST depression on 12-lead ECG, heart failure and haemodynamic or electrical instability. Due to the amount of myocardium in jeopardy and the risks related to it, pharmacological and mechanical treatment (percutaneous or surgical) should be very carefully taken into account and as soon as possible offered to every patient with such issue.

**Keywords:** NSTEMI, treatment, angiography

## HEART FAILURE IN DIABETIC PATIENTS

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The association between heart failure and diabetes is more and more common in medical practice due to the increased prevalence of these conditions, caused by aging of the population in the last years, unhealthy lifestyle, the high prevalence of obesity and the lack of physical activity.

A strict control of the glycemic profile, was considered to be the most important therapeutic strategy in diabetic patients with heart failure, but there are studies which demonstrate that intensive glycemic control does not significantly influence the risk of developing heart failure.

Until recently, none of the oral hypoglycemic agents has shown superior efficacy in diabetic patients with heart failure. Metformin appeared to be the only drug that lowers cardiovascular events in patients with type 2 diabetes, independent of glycemic control.

Lately, empagliflozin, a selective inhibitor of sodium glucose cotransporter 2, added to standard care, demonstrated to reduce cardiac decompensation and cardiovascular mortality in diabetic patients with heart failure.

Recent studies have shown that ST2 and galectin 3 are major markers of cardiovascular risk and mortality in patients with heart failure, but the benefits of lowering these markers in diabetic patients require further assessment. NT-pro BNP is still an important maker for these patients.

## CORONARY HEART DISEASE IN WOMEN

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**Objectives.** The incidence and prevalence of cardiovascular disease among female patients has increased significantly over the past 50 years. Currently, cardiovascular pathology is similar in both female and male sex, with only one exception, 10 years of delay in cardiovascular pathology in female sex, delayed by the hormonal protective effects that occur until menopause. Gender differences in the symptomatology of coronary syndromes can be explained by the particularities that occur in the two sexes at the anatomic, physiological and psychological level. In women, coronary arteries are narrower and with less developed collateral circulation, which could lead to more pronounced ischemia during stress in women compared to male. However, in general, the first form of coronary heart disease in women is by angina pectoris, while male sex is more common in myocardial infarction or even sudden cardiac death. Regarding the pathophysiological mechanisms involved in the occurrence of ischemic cardiopathy in women, it can be stated that at the level of the coronary circulation there can be intervening mainly two mechanisms - one represented by endothelium-independent dysfunction (microvascular dysfunction), and the second being represented by the endothelium -dependent dysfunction (endothelial dysfunction). Inflammation, which is much higher in women, is also implicated in the appearance of coronary artery plaque and with the onset of menopause, the plaque composition changes, becomes more vulnerable and obstructive. Clinically, the symptoms of coronary heart disease in women compared with males are generally given by angina, the pain being mostly atypical in women, only 29.7%, accusing typical angina pain. Women diagnosed with coronary artery disease benefit, to a lesser extent, from non-invasive/ invasive diagnostic methods, as well as from treatment methods. The treatment of coronary artery disease has significant discrepancies between the two sexes, men receiving superior therapeutic care. Mortality is higher in the first 30 days, regardless of the method of revascularization, but the recurrence of the coronary event is then lower than that recorded for male gender.



## THE LONG PATH TO MANAGING AN ACUTE PERICARDITIS

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Acute pericarditis is the cause of approximately 5% of emergency department presentations of non-ischemic thoracic pain. In developed countries the most common forms are viral and idiopathic, whereas tuberculosis represents one of the main etiologies in developing countries. In most cases, acute pericarditis presents as a self limited episode with a high response rate to anti-inflammatory therapy. A more extensive diagnostic workup is usually not necessary as it does not alter the course or the treatment. However, lack of response to medical therapy, large pericardial effusion, cardiac tamponade or high fever are among the high-risk features which justify a thorough etiological evaluation. Still's disease is a rare systemic inflammatory disease which should be considered in the differential diagnosis of pericarditis, even though pericardial disease is an uncommon presenting manifestation. We present the case of a 21 year old female admitted for acute pericarditis complicated by cardiac tamponade. The paraclinical workup strongly point to this clinical presentation as the first manifestation of Still's disease, even though tuberculosis could not be completely ruled out as the cause of our patient's symptoms.

**Keywords:** pericardial disease, tamponade, Still's disease

## CARDIAC ARRHYTHMIAS MECHANISMS IN OBESE HEART FAILURE PATIENTS

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**Materials and methods.** Structural cardiac abnormalities such as myocyte hypertrophy, fibrosis, fatty infiltration and increased epicardial fat are described in obese heart failure patients. It has been demonstrated that obesity is a major risk factor for the development of left atrial enlargement, contributing to the development of atrial fibrillation. The atrial electrophysiological properties are modified by the local inflammation through increases in adipocytokines and proinflammatory markers. Moreover, epicardial fat directly contracts the atria, which may have direct arrhythmogenic effects, facilitating the maintenance of reentrant circuits. Studies indicate that pericardial fat is associated with the increased prevalence and severity of AF. Also, changes in the adipokine pathway, as well as other inflammatory mediators seen in obese individuals, may contribute to the pathophysiology of cardiac arrhythmias.

**Results.** An important additional mechanism responsible for the increased risk of arrhythmias in obese heart failure patients is sympathetic over activation, with an increased propensity to ventricular arrhythmias and sudden cardiac death. Studies suggest that obese heart failure patients undergoing cardiac resynchronization therapy defibrillator (CRT-D) have an improved long-term survival, LV reverse remodeling after CRT being more substantial among overweight and obese patients than in normoponderal individuals.

**Conclusions.** In conclusion, there are multiple factors linking obesity, heart failure and cardiac arrhythmias and therefore an identification of the genetic markers, molecular components of the ion channels and repolarization reserve, novel biomarkers predicting arrhythmia risk, improve the individual preventive and therapeutic approaches.

**Keywords:** obesity, heart failure, cardiac arrhythmias

## RADIOFREQUENCY CATHETER ABLATION OF IDIOPATHIC RIGHT VENTRICULAR OUTFLOW TRACT TACHYCARDIA

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**Objectives.** Ventricular tachycardia (VT) is usually associated with structural heart disease. Idiopathic VT is a distinct entity whose management and prognosis differ from VT associated with structural heart disease. Taking into account the limited efficacy of the antiarrhythmic agents in terminating the arrhythmia, there has been an increase in radiofrequency(RF) catheter ablation, due to its high success rate and low recurrence rate. We present the case of a 61 year old patient with frequent premature ventricular contractions (PVC), sustained and non-sustained episodes of VT, poor antiarrhythmic-treatment response and no signs of structural heart disease, who underwent a RF ablation procedure at the Rehabilitation Hospital in Cluj-Napoca.

**Materials and methods.** The procedure was guided by the 3D mapping system NavX (St. Jude Medical). In the first part of the procedure, an anatomical map of the right ventricle (RV) was performed and then an activation map, focusing on the right ventricle outflow tract (RVOT). The activation map was created with the help of the bipolar electrograms collected by the ablation catheter. The mapping of the RVOT revealed early activation of a site located on the superior portion of the RVOT's anteroseptal wall.

**Results.** The activation map collected with the help of the bipolar electrograms pinpointed the VT's origin on the superior anteroseptal wall of the RVOT. The RF application at this specific site resulted in the suppression of the ventricular arrhythmia. There were no intraoperative or postprocedural complications. A 24h Holter-EKG Monitoring was performed after the procedure, which revealed no PVCs. The patient was in sinus rhythm and completely asymptomatic at the 6-month follow-up.

**Conclusions.** RF ablation, guided by a 3D mapping system is highly useful in localizing and treating drug-resistant idiopathic VT. The activation map created with the bipolar recordings may allow a more precise localization of the VT's origin, when compared to unipolar electrograms.

**Keywords:** idiopathic VT, radiofrequency catheter ablation

## ALL IS LOST?

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**Introduction.** Aortic complications after cardiac surgery remain a big challenge for the cardiac surgeon.

**Case presentation.** We present the case of a 67 year old male operated in our clinic with aortic valve replacement with a biological prosthesis. The short term postoperative evolution was uneventful. 11 days after being discharged he was admitted to another medical service for pre-sternal wound complications. Despite being microbiological sterile and despite proper wound care there was no tendency of healing. He was then admitted to our service. A routine heart ultrasound revealed a giant pseudo-aneurysm of the ascending aorta. Emergency surgery was undertaken. With the aid of cardiopulmonary by-pass, a beating heart repair of the aortic wall tear was performed. The microbiological assay again revealed no identifiable germs. The evolution was again uneventful, with normal post-op angio-CT and ultrasound. 38 days after the second procedure, the patient is again admitted to our service with pre-sternal wound complications. An angio-CT is performed which reveals a second pseudo-aneurysm of the ascending aorta 3 cm proximally from the first one, this time with a larger aortic tear. A third emergency intervention is performed, this time in total hypothermic arrest with patch reconstruction of the ascending aorta. The evolution this time was more difficult the patient presenting transient neurological disorders. 5 weeks after surgery he is on his way to a full recovery.

**Conclusions.** In conclusion, in cardiac surgery, one should never give up, because nothing is ever lost!

## AORTIC VALVE ENDOCARDITIS WITH SEVERE LOCAL COMPLICATIONS – A SURGICAL CHALLENGE

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**Introduction.** Infective endocarditis (IE) remains a cardiac pathology associated with high morbidity and mortality and, furthermore, a major challenge for the cardiac surgeon.

**Case presentation.** We present the case of a 42-year-old male patient, diagnosed with aortic valve infective endocarditis and high suspicion of periannular complications. The transesophageal echocardiography revealed a circular aortic root abscess. The patient was urgently referred for surgery due to the rapid deterioration of the hemodynamic status. The intraoperative inspection of the aortic valve revealed a vegetation on the right coronary commissure, and a giant abscess with a fistula opened into the right ventricle, a large communication between the left and the right ventricle. We performed ventricular septal defect closure plus a valved conduit was used to replace the aortic root. The re-implantation of the coronary ostia into the tubular graft was technically not possible so a triple coronary bypass with saphenous vein was performed. The overall postoperative course of the patient was uneventful.

**Conclusions.** The complete and accurate preoperative diagnosis in infectious endocarditis and their optimal surgical corrections remain challenging.

## NIGHTMARE ... OR SWEET DREAM?

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We present the case of a 60 year old male operated in our clinic with aorto-bifemoral bypass for a chronic abdominal aortic aneurysm. The short-term postoperative evolution was uneventful but after 4 days he became feverish and he required inotropic and vasopressor support. An abdominal CT was performed which found no remarkable items. His condition worsened and needed to be intubated and mechanically ventilated. He remained in this critical state for 2 weeks, time in which he continued to present high fever and high blood count despite the normal results of another two thoraco-abdominal CT's. He was extubated on day 30 postoperative and after 40 days of continuous intensive care he was transferred to the clinical ward. After 72 days he was finally discharged. To this day it is a mystery of how he deteriorated with no identifiable cause. In conclusion what seemed like a nightmare for 72 days became a very nice dream when the patient was discharged in good health.

## THERAPEUTIC STRATEGY IN A PATIENT WITH DILATED CARDIOMIOPATHY AND MULTIPLE COMORBIDITIES

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**Purpose.** Dilated cardiomyopathy (DCM) is a disabling pathology dramatically affecting the patients' quality of life. Progresses in medicine over the past decades have led to the emergence of effective therapies such as cardiac resynchronization therapy.

**Method.** We present the case of a 68-year-old patient with DCM, moderate mitral regurgitation, moderate pulmonary arterial hypertension (PAH), paroxysmal atrial fibrillation, ischemic stroke, hepatic steatofibrosis and gastroduodenal ulcer, sent to the Heart Institute Cluj-Napoca for an episode of loss of consciousness (interpreted as cardiorespiratory arrest – with restoration of the heart rhythm after chest compressions and iv Adrenaline).

At admission the patient was unstable, requiring inotropic support, with altered blood tests. Electrocardiogram revealed sinus rhythm with LBBB morphology (QRS=220 ms). Echocardiography showed a dilated LV with partial non-compaction criteria, severe systolic dysfunction (EF=12%), moderate diastolic dysfunction, severe mitral regurgitation, severe PAH, small pericardial and pleural effusion.

Coronary angiography found normal arteries. As the diagnosis of hemochromatosis was excluded (suspected based on the blood test), the pathology was considered to have a toxic and genetic etiology (partial non-compact LV).

During hospitalization, the patient presented sustained ventricular tachycardia cardioverted to sinus rhythm with antiarrhythmic drugs. As the patient met all guideline criteria for CRT, with an episode of life threatening arrhythmia, a triple chamber implantable cardioverter- defibrillator (CRT-D) was implanted.

**Results.** Post CRT-D implantation there was a significant clinical improvement, with QRS narrowing (150ms) and increased systolic function (EF=23%).

**Conclusions.** The presented case highlights the additional benefits offered by the non-pharmacological therapies in heart failure patients with multiple comorbidities.