Correlations between left ventricular rotation and twist and aortic stiffness – Results from the three-dimensional speckle-tracking echocardiographic MAGYAR-Healthy Study

Domsik P[1], Kalapos A[1], Lengyel C[2], Orosz A[3], Forster T[3], Nemes A[1]

[1,2nd] Department of Medicine and Cardiology Center, Medical Faculty, Albert-Szent-Gyorgyi Clinical Center, University of Szeged, Szeged, Hungary, [2,1st] Department of Medicine, Medical Faculty, Albert-Szent-Gyorgyi Clinical Center, University of Szeged, Szeged, Hungary, [3]Department of Pharmacology and Pharmacotherapy, Medical Faculty, Albert-Szent-Gyorgyi Clinical Center, University of Szeged, Szeged, Hungary

Introduction: Left ventricular (LV) twist is the wringing motion of the heart, and has an important, but not fully evaluated role in the systolic and diastolic LV function. LV twist is the result of clockwise rotation of the LV base and counterclockwise rotation of the LV apex. It is well-known that stiffening of the aortic wall leads to changes in blood pressures compromising coronary perfusion and LV function. Three-dimensional (3D) speckle-tracking echocardiography (3DSTE) is a new clinical tool with which LV rotational and twist parameters could be quantified non-invasively. The present study was designed to find a relationship between 3DSTE-derived LV rotation and twist and echocardiographic aortic elastic properties in healthy subjects.
Methods: The present study comprised 26 healthy volunteers (mean age: 36.0 ± 11.3 years, 13 men). All subjects had undergone complete 2-dimensional Doppler echocardiographic study extended with aortic stiffness measurements and 3DSTE. From 3D datasets basal and apical LV rotation and LV twist were assessed. Echocardiographic aortic stiffness parameters were calculated from systolic and diastolic ascending aortic diameter and blood pressure data.
Results: Mean aortic strain (0.131 ± 0.094), aortic distensibility (3.61 ± 2.54 cm^2/dynes 10^{-3}) and aortic stiffness index (ASI) (4.08 ± 0.79) were in normal range, as well as basal (-2.42 ± 1.43 degrees) and apical LV rotations (8.56 ± 1.43 degrees) and LV twist (11.01 ± 5.19 degrees). Apical LV rotation correlated with aortic distensibility ($r = -0.36$, $p < 0.05$) and ASI ($r = 0.41$, $p < 0.05$), while LV twist showed similar correlation with ASI ($r = 0.42$, $p < 0.05$).
Conclusions: Correlations exist between 3DSTE-derived apical LV rotation and LV twist and echocardiographic aortic elastic properties in healthy volunteers.
E-mail: nemes.attila@med.u-szeged.hu

Holter ECG monitoring findings in patients with metabolic syndrome and critical limb ischaemia

Gaspar L, Makovnik M, Hlinstakova S, Gavornik P, Dukat A, Bendzala M

II. Department of Internal Medicine, University Hospital and Faculty of Medicine Comenius University Bratislava, Slovak Republic

Introduction: Metabolic syndrome (MS), known as insuline resistance syndrome with not accidental collective occurence of global and central obesity, carbohydrate tolerance impairment, dyslipaemia, hypertension and other factors (components), is associated with higher cardiovascular mortality and prevalence of ischaemic heart disease, myocardial infarction and stroke. Overall and cardiovascular mortality according to ankle-brachial pressure index (ABI) is increasing with the decrease of ABI, but also in patients with medial calcinosis (ABI above 1.3) is significantly increased. Medial calcinosis is often detected in patients with MS, DM and renal failure.
Aim of the study: In a group of patients with MS and critical limb ischaemia (CLI) to detect with Holter ECG monitoring the occurence of complex forms of ventricular arrhythmias and myocardial ischaemia. To evaluate the contribution of Holter ECG monitoring in therapeutic management of this patients.
Patients and Methods: We investigated 28 patients (19 male and 9 female) with CLI, stage III or IV. Fontaine, indicated for revascularisation procedure, amputation or conservative treatment. The mean age was 69 years (range 56-86). Mean waist circumference in females was 94 cm and in males 103 cm. All suffered from DM, 12 were on dietary regime, 5 were treated by antidiabetic drugs and 11 by insulin. Mean value of basal glycaemia was 8.9 mmol/L, mean HbA1c value was 6.0%. Holter ECG monitoring was performed with an Marquette-Hellige, 3 channel device, mean recording duration was 22.48 hour. Conservative treatment of CLI was applied in 11 patients, femoropopliteal bypass in 2, amputation was performed in 10 patients, percutaneous transluminal angioplasty (PTA)in 2 and PTA with amputation in 3 patients.
Results: Normal Holter ECG records (without ischaemia or arrhythmias) were detected only in 6 patients (22%). All the other has cardiac arrhythmias or significant myocardial ischaemia. Complex forms of ventricular arrhythmias type Lown IV A were detected in 8 patients, atrial fibrillation in 5, A-V block 2nd degree type Mobitz I with 4-second asystolic pauses in 1 patient and significant myocardial ischaemia was in 6 patients (22%).
Conclusions: Our results confirm that patients with metabolic syndrome and critical limb ischaemia has increased risk of possible perioperative cardiovascular complications. Holter ECG monitoring provide us important data which allows this risk to decrease, especially in patients with complex forms of ventricular ectopic beats, atrial fibrillation and also A-V blocks higher degree with significant asystolic pauses.
E-mail: ludovitgaspar@gmail.com

Drug eluting balloon – a solution for recurrent multiple pulmonary vein stenoses complicating catheter ablation of paroxysmal refractory atrial fibrillation? A case report

Geller L, Kudrnova S, Apor A

Semmelweis University, Heart Centre, Budapest, Hungary

Background: Radiofrequency ablation (RFA) of ectopic foci within pulmonary veins and surrounding atrial tissue has become an effective treatment for refractory paroxysmal atrial fibrillation (AF). Pulmonary vein stenosis (PVS) represents its very rare, but serious complication causing hemodynamic compromise leading to chronic irreversible vascular and parenchymal pulmonary changes and occurring in 1-3% of mostly reablated patients even in very experienced centers. Since 2004, more than 600 patients have been RF ablated in our centre. 6 patients (3 after reablation) have returned with PVS symptoms (effort dyspnoe, cough, hemoptoe). Through analysis of our most challenging PVS case, we would like to demonstrate our learning curve in interventional management of this chronic multifocal iatrogenic disease.
Materials and methods: 43 years old male with a history of paroxysmal refractory AF and no underwent successful catheter ablation in April 2008 and reablation due to palpitations and effort dyspnoe two months later. The patient has so far returned to our hospital 7 times within 42 months complaining of effort dyspnoe and cough with pulmonary hypertension due to PVS confirmed by MRA or precisely depicted by CTA scans. Eight months following reablation a short ostial occlusion of LSPV, significant stenosis of RSPV, moderate stenosis of RIPV and long complete occlusion of LIPV was shown by MRA. Consequently a successful transcathetral recanalisation and balloon dilation of LSPV and PTA of RSPV was performed. Two months later stenting of the LSPV, balloon angioplasty of the RSPV and RIPV occurred due to symptomatic restenoses. Two months later we were forced to perform stenting of the RSPV and balloon angioplasty of LIPV and LSPV. After 7 months restenting of LSPV and stenting of the RSPV followed. Following next 19 months an access to a scarred fibrotic atrial septum and pulmonary veins was gained with help of steerable 8.5 F introducer DEB was placed into a significantly in-stent restenotic LSPV and moderately restenotic RSPV and RIPV were balloon redilated. We will perform a 3-month follow-up MR.
Results: Between July 2009 and February 2012 the patient underwent 5 endovascular multiple pulmonary venoplasties leading to immediate though temporary relief of symptoms and correction of pulmonary pressure values. Symptomatic significant stenoses were first balloon dilated, in case of rebound stenosis or restenosis or in-stent restenosis stented. In the last session a drug luting balloon was used in the three times restenosed LSPV.
Conclusion: Early, occlusion preventing intervention even in asymptomatic significant stenosis with prompt stent placement might prevent hemodynamic compromise leading to potentially fatal irreversible parenchymal and vascular pulmonary changes. Balloon angioplasty alone does not bring good long term patency. Since the lesions are usually ostial, slight protrusion of stent into the atrium should be achieved, as confirmed by use of intraoperative multiplanar TEE. Use of steerable introducer Agilis should provide access even into fibrotic scarred atrial septum and restenosed PVS. Use of drug eluting balloons may provide solution in case of in-stent restenosis.
skudrnova@gmail.com

Identificatin of a novel *KCNJ2* mutation causing Andersen-Tawil syndrome in a Hungarian patient

Hategan L[1], Katona M[2], Kornyei L[1], Racz K[2], Csanady M[1], Forster T[1], Sepp R[2]

Cardiology Center and [2]Department of Pediatrics, University of Szeged; [1]„Gottsegen Gyorgy" National Institute for Cardiology, Budapest, Hungary

Background: Andersen-Tawil syndrome is a multisystem disorder mainly caused by mutations in the gene *KCNJ2* which encodes the inward rectifier K^+ channel, Kir2.1. The disease is characterised by ventricular arrhythmias, periodic paralysis and dysmorphic features.
Case history: The 15-year-old female patient presented to us with ventricular arhythmias mainly manifesting as frequent ventricular premature beats or short runs of non-sustained ventricular tachycardia. Typical bidirectional ventricular tachycardia was not recorded. The arrhythmia did not respond to beta blockers or sotalol, amiodarone was somehow effective but it had to be stopped because of thyreotoxicosis. Echocardiography revealed normal cardiac parameters and function. Leg pain or dumbness, lasting for several days, was also noted. In addition, typical facial features including low-set ears, hypertelorism and micrognathia raised the suspicion of Andersen-Tawil syndrome.
Methods and results: The whole coding sequence of the *KCNJ2* gene was amplified and direct sequenced in four fragements. Sequencing revealed a three base-pair deletion (del1288-1290TGG) in the region encoding the C terminal part of the protein. The mutation affects the last two base pairs of codon 302 and the first base pair of codon 303 and leads to a complete frame shift, leaving codon 301 as the last normal codon. Interestingly, sequence analysis suggest that no stop codon is found in the mutant sequence and the mutation is not predicted to lead to a truncated protein. Instead, the whole mutated sequnce is supposed to be translated leading