

Clinical and Research Medicine: Pace and Cardiac Electrophysiology

e0547 LEFT ATRIUM FUNCTION IN PATIENTS WITH PAROXYSMAL ATRIAL FIBRILLATION: ANALYSIS FROM TWO-DIMENSIONAL SPECKLE TRACKING ECHOCARDIOGRAPHY

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Introduction To observe the changes of left atrium function in patients with paroxysmal atrial fibrillation (AF) using two-dimensional (2D) speckle tracking echocardiography (STE).

Methods The study population consisted of 33 patients with paroxysmal atrial fibrillation and 30 age, sex-matched control subjects in sinus rhythm (SR) who were referred to our echocardiography laboratory. All of the patients were in sinus rhythm when they were checked. Left atrial diameter (LAD), left atrial area (LAA), interventricular septum thickness (IVST); Left ventricular end-diastolic diameter (LVEDD) were measured in 2-dimensional echocardiography imaging. LV ejection fraction was determined. Measured mitral valve A wave velocity time integral (VTI-A) and maximum velocity (VA). LA wall strain in the longitudinal direction obtained using 2DSTE. Measured peak atrial longitudinal strain (PALS) and atrial contraction longitudinal strain (ACLS) in apical 4-chamber view and apical 2-chamber view. Measured time to peak longitudinal strain (TPLS). Δ TPLS was defined as the difference between the TPLS in apical 4-chamber view and apical 2-chamber view.

Results There were no significant differences between the 2 groups regarding age (63 ± 12 vs 60 ± 9 years), sex (males 48% vs 60%) and history of hypertension and diabetes mellitus. Compared with control group, Δ TPLS were significantly increased in AF group (52.83 ± 32.2 vs 31.33 ± 20.2 , $p < 0.05$). In Patients with AF, ACLS were significantly decreased than in control group (10.09 ± 3.3 vs 13.74 ± 3.1 , $p < 0.05$). The PALS; LAD; LVEDD; IVS; EF; VA; VTI-A and LAA between paroxysmal AF and control group did not show significant difference ($p > 0.05$).

Conclusions 2DSTE can effectively and easily measure LA Δ TPLS and ACLS, speckle tracking echocardiography could be a method to non-invasively assess LA function in paroxysmal atrial fibrillation patients.

e0548 CORRELATION BETWEEN APNOEA HYPOPNOEA INDEX AND SLEEPING HEART RATE IN CHINESE ADULT

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Objective To detect the correlation between apnoea-hypopnoea index (AHI) and parameters of sleeping heart rate.

Method 404 subjects who experienced polysomnography (PSG) during 2005–2008 in The Third Hospital of Peking University ENT department were included. The participants were separated as obstructive sleep apnoea-hypopnoea syndrome and normal population. OSAHS patients were divided into mild, moderate and severe group according to Chinese guideline. Max sleeping heart rate (MaxHR), min sleeping heart rate (MinHR) and difference of heart rate (max minus min, dHR) were compared between groups.

Result 1) MaxHR, MinHR and dHR were 92.00 ± 13.11 /min, 51.15 ± 9.72 /min and 40.84 ± 12.30 /min in OSAHS population. The three parameters in control participants were 87.40 ± 11.82 /min, 50.24 ± 9.81 /min and 37.16 ± 12.35 /min, respectively. Significant differences of MaxHR and dHR were detected between OSAHS

group and control ones, besides MinHR. ($p_{\text{MaxHR}}=0.003$, $p_{\text{dHR}}=0.028$ and $p_{\text{MinHR}}=0.440$). 2) Positive correlation were detected between AHI and MaxHR ($r=0.320$, $p < 0.001$), as well as dHR ($r=0.205$, $p < 0.001$). 3) Linear regression was performed to adjusted bias induced by sex, age or other factors. Result of regression indicated that AHI was an independent factor of MaxHR and dHR.

Conclusion The max sleeping heart rate and difference of sleeping heart rate was significantly high in OSAHS population. AHI was an independent risk factor of sleeping heart rate.

e0549 SINGLE CENTRE EXPERIENCE ON INTRATHORACIC IMPEDANCE MONITORING IN CHRONIC HEART FAILURE PATIENTS

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Objective To observe the effectiveness of intrathoracic impedance monitoring on detecting aggravation in chronic heart failure patients with InSync Sentry CRT-D.

Methods We retrospectively analysed the clinical data of 14 consecutive patients. Patients were regularly followed up every 3–6 months after the implantation. At each visit, interrogation of the device was done by specified doctors. Patients were instructed to inform the researcher in case of a device alert, and to take extra 40 mg of furosemidum if they really had aggravated symptoms later. Data about heart failure hospitalisation was collected retrospectively from the medical record.

Results During 18–48 months follow-up, a total of 7 patients encountered 28 alert events. Among the 28 alert events, 3 (10.7%) alerts were not followed by any clinical condition, and 23 (82.1%) alerts were followed by deterioration of heart failure symptoms. Besides, 2 alerts were related to the onset of pulmonary infection. In the end, only 5 patients were hospitalised 10 times for deterioration of cardiac function.

Conclusions The function of intrathoracic impedance monitoring is reliable in predicting deterioration of heart failure, so prompt medical intervention may reduce symptoms and hospitalisations due to decompensation.

e0550 RADIOFREQUENCY CATHETER ABLATION OF LEFT CONCEALED ATRIOVENTRICULAR ACCESSORY PATHWAY WITH RAPID RATE DEPENDENT VENTRICULOATRIAL CONDUCTION

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Objective To investigate the characteristics of supraventricular tachycardia affiliated with left concealed atrioventricular accessory pathway (AP) with rapid rate dependent ventriculoatrial conduction and the experience of electrophysiological (EP) study and radiofrequency catheter ablation (RFCA) in these cases.

Methods 8 patients, 5 male, 3 female, aged from 24 to 62 years, who all had symptoms of paroxysmal palpitation and whose ECG recorded at the onset of tachycardia all manifested as narrow QRS complex, underwent electrophysiologic study and RFCA by the routine method, which including the properties of ventriculoatrial conduction while pacing (S_1S_1) were performed in right ventricular apex (RVA) and left ventricle, mapping AP and RFCA.

Result 8 cases were all left concealed atrioventricular AP. In all patients that special kind of atrioventricular AP with rapid rate

dependent ventriculoatrial conduction were demonstrated to exist by EP study and the atrio-ventricular reentrant tachycardia with the earliest atrial activated site located were induced. When pacing with slow rate in RVA, there were no ventriculoatrial conduction by AP; when pacing with fast rate, there were internal ventriculoatrial conduction by AP and when pacing with faster rate, there were 1:1 ventriculoatrial conduction by AP. Ablation were identified during rapid rate ventricular pacing and a successful ablation was attained in every patient.

Conclusion Rapid rate dependent conduction of left concealed atrioventricular accessory pathway is existent and it can also induce atrioventricular reentrant tachycardia. We should pay attention to it avoiding missed diagnosis.

e0551 RADIOFREQUENCY CATHETER ABLATION OF VENTRICULAR TACHYCARDIA IN PATIENTS WITH STRUCTURAL HEART DISEASES USING CARTO ELECTROANATOMIC MAPPING SYSTEM AND A SALINEIRRIGATED TIP CATHETER

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Introduction The aim of this study was to investigate the results of radiofrequency catheter ablation of ventricular tachycardia (VT) in patients with organic heart diseases utilising CARTO system and a saline-irrigated tip catheter.

Method 31 patients (26 men), aged from 6 to 75 years, had palpitation and sustained VT or ventricular fibrillation (VF) and 15 patients had the histories of syncope. 9 patients with Fallot syndromes after cardiac surgery, 4 patients with old myocardial infarction (one had ventricular electrical storm after ICD implantation), 1 patient with ventricular electrical storm after acute myocardial infarction, 17 patients with ARVC or dilated cardiomyopathy. CARTO system was used for directing mapping and ablating VT. For mappable VT, the VT mapping techniques included activation, entrainment, and voltage mapping using standard criteria. For unmappable VT, the site of origin was approximated by the site of pace mapping that generated QRS complexes similar to those of VT. Radiofrequency ablation was performed as linear lesions based on the location of the best pace map, the location of valvular anatomic boundaries, and the substrate defined by the voltage mapping.

Result 56 morphologies of VT (1–5 morphologies of VT in 1 patient) were induced in 29 patients, including 38 morphologies of mappable VT and 18 unmappable VT. In 24 patients who had at least 1 morphology of mappable VT, mapping and ablation was performed during VT, and in the other 5 patients who had unmappable VT, substrate mapping and ablation was performed during sinus rhythm. Radiofrequency ablation eliminated VT in 20 patients and failed to ablate VT in 9 patients (most had cardiomyopathy). In 1 ARVC patient with multiple morphologies of frequent ventricular premature beats (VPBs) and syncope, ablation of VPBs and VT substrate were performed. In the other patient who had drug-refractory ventricular electrical storm after acute myocardial infarction, ablation of VPBs originating from Purkinje network eliminated VT and VF recurrence. During 3 to 42 months of follow-up, 20 out of 22 patients who had a successful VT or VPBs ablation did not had VT and VF recurrence, and the 2 patient who had VT recurrence had a successful VT ablation in the second procedures. In the 9 patients who had a failure ablation of VT (no ICD implantation because of economic reason), antiarrhythmic drugs were taken. There were no VT recurrence in 2 patients and less VT attacks in 4 patients.

Conclusion Based on the electronanatomic mapping, radiofrequency ablation of VT using a saline-irrigated tip catheter in patients with organic heart diseases might have high successful and effective rate.

e0552 THE ANALYSIS OF CAUSE AND INCIDENCE OF NONRESPONSE AFTER CARDIAC RESYNCHRONISATION THERAPY

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Introduction The aim of this study was to observe the incidence of CRT nonresponse in our center and investigate the possible reasons to lead to CRT nonresponse.

Methods 112 patients with CRT implantation were included in this study. There were 33 with ischaemic heart disease and 79 with non-ischaemic heart disease, 23 patients with permanent atrial fibrillation, 59 in NYHA class III and 53 in class IV. Patients were followed up more than 1 year. CRT response was defined as the improvement in NYHA class of ≥ 1 grade and 6-min walk test (6-MWT) of $\geq 25\%$ and/or the increase of left ventricular ejection fraction (LVEF) of $\geq 15\%$.

Results The all mortality was 11.61%, the reasons of death were due to heart failure aggravation in 3 patients, sudden death in 4, acute myocardial infarction in 2 and noncardiac death in 4. 82 patients had a positive CRT response, but the other 30 patients (26.79%) were nonresponse to CRT including 9 patients (8.04%) with no improvement in NYHA class, 6-MWT and LVEF. 21 patients (18.75%) with no improvement in LVEF but with significant improvement in NYHA class and 6-MWT. Among nonresponders 3 patients died for heart failure aggravation. The basal data before CRT implantation were comparable between CRT response group and nonresponse group ($p > 0.05$). The age, gender, narrow QRS duration before CRT and increased QRS duration after CRT did not impacted in CRT response ($p > 0.05$). Permanent atrial fibrillation (AF) did not lead to CRT nonresponse, among them the incidence of nonresponse was not more than in patients without AF (17.39% vs 25.84%, $p > 0.05$). There was also no relation between different RV pacing leads position and the incidence of CRT nonresponse (27.06% in RV apex leads vs 25.93% in RV septum, $p > 0.05$). There were 6 patients with right bundle branch block (RBBB), 5 of them had nonresponse to CRT (83.33%, $p < 0.01$). The patients with non-ischaemic heart disease had higher incidence than patients with ischaemic heart disease (32.05% vs 14.71%, $p < 0.05$). LV lead positions can impact CRT response. The incidence of CRT nonresponse was 23.08% in lateral marginal, 22.22% in posterolateral vein, 38.10% in middle cardiac vein and 75% in great cardiac vein ($p < 0.01$).

Conclusions The incidence of CRT nonresponse was higher in patients with non-ischaemic heart disease than with ischaemic heart disease since coronary angioplasty had been completed in the crimal vessels. Although QRS duration was obviously wider in RBBB, the incidence of CRT nonresponse was still significant increase. LV pacing lead positions was the crucial factor to response of CRT.

e0553 EFFECT OF PULMONARY HYPERTENSION ON THE PROGNOSIS OF PATIENTS WITH CARDIAC RESYNCHRONISATION THERAPY

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Introduction There was a little of information about the effect of pulmonary artery hypertension to the clinical prognosis in patients with cardiac resynchronisation therapy (CRT). We aimed to