1212-18 Identification of Endocardial Trigger and Exit of Right Ventricular Outflow Tract Tachycardia: Implication for Radiofrequency Catheter Ablation

Young-Hoon Kim, Sang Yeon Park, Seong Mi Park, Seung Yoon Rha, Do Sun Lim, Wan Joo Shim, Young Moo Ro, Korea University Medical Center, Seoul, South Korea

Background: Catecholamine sensitive triggered activity seems to be the mechanism of idiopathic right ventricular outflow tract tachycardia (RVOT VT) and early after depolarization is associated with occurrence of RVOT VT and type of VT. We investigated whether the endocardial triggers during diastolic period precede the exit of RVOT VT and can be identified by non-contact mapping system (ESI 3000) to guide successful radiofrequency (RF) catheter ablation (RFCA).

Methods: The study included 11 patients with RVOT VT referred for non-contact mapping and RFCA (4 women, 44±7 years, range 22 to 55). No patients had structural heart diseases as documented by normal echocardiography and cardiac magnetic resonance imaging. All patients had an inferiorly directed VT configuration, with a precardial shift were transition equal to or later than V3. VTs were induced by rapid ventricular pacing and/or after isoproterenol infusion. The multielectrode array was positioned at the RVOT to identify endocardial triggers preceding the exit points of VT. RF was applied at the exit or the area between exit and trigger.

Results: The earliest endocardial exits were registered at RVOT -27±9 ms before onset of QRS in all patients. The earliest diastolic triggers were identified within the distance of 28±15 mm from the exits and registered 7±12 ms before QRS in 8/11 patients. A line of block between exits and triggers was made in 8 patients and targeted the exits in 3 patients. At a follow up of 16±6 months, recurrence was noted only in exit-targeted patients (p=0.002 vs. none in those with sequential loopexit).

Conclusions: The endocardial trigger and exit points could be identified in most patients with RVOT VT using non-contact mapping system and are useful to guide effective RFCA.

POSTER SESSION

1213 Prognostic Implications of New Electrocardiographic Techniques

Tuesday, April 01, 2003, 3:00 p.m.-5:00 p.m.
McCormick Place, Hall A
Presentation Hour: 4:00 p.m.-5:00 p.m.

1213-3 Prolonged QRS Duration and Cardiac Death in Postinfarction Patients

Yazid Y. Fadl, Wojciech Zareba, Arthur J. Moss, for the MDPIT Investigators, University of Rochester, Rochester, NY

Background: The aim of this study is to investigate the prognostic significance of QRS duration measured in a standard electrocardiogram (ECG) for predicting cardiac events in postinfarction patients.

Methods: The study population includes 2,466 postinfarction patients enrolled in the Multicenter Dialatent Postinfarction Trial (MDPIT), by which QRS duration is measured in ECGs recorded 5-7 days after an acute myocardial infarction. Cardiac death is the endpoint for this analysis.

Results: There are 186 patients (8%) showing prolongation of QRS defined as XI.12 seconds. Multivariate logistic regression analysis reveals the following clinical variables independently associated with widened QRS: age >60 (Odds Ratio [OR]: 2.3, p<0.0001), ejection fraction <35% (OR: 2, p=0.0001), history of pulmonary congestion (OR: 1.7, p=0.004), male gender (OR: 1.8, p=0.003), and history of prior MI (OR: 1.9, p=0.0002). During an average follow-up of 25 months, there exists a significantly greater number of cardiac deaths in patients with prolonged QRS as compared to those with QRS <12 seconds (26% vs. 9%, p<0.0001). After adjusting for age, gender, history of hypertension, diabetes, LVH, pulmonary congestion, and prior myocardial infarction, a multivariate Cox proportional hazards regression model reveals prolonged QRS duration is associated with a 70% greater risk of cardiac death (HR=1.7, p=0.001).

Conclusion: Prolonged QRS duration is a significant and independent predictor of cardiac death in postinfarction patients. The analysis of QRS duration in standard ECGs could improve the decision making process when qualifying patients for implantable cardioverter-defibrillators.

1213-4 The Prognostic Significance of Short-Term Measurements of Heart Rate Variability Assessed Early Following Acute Myocardial Infarction

Richard P. Seeds, Janine Fletcher, Mike Smith, John West, Kevin S. Channer, Jonathan N. Toward, Royal Hallamshire Hospital, Sheffield, United Kingdom, University of Birmingham, Sheffield, United Kingdom

Background: Depressed heart rate variability (HRV) is a powerful risk predictor in patients following myocardial infarction (MI). The predictive value of HRV has been excessively censored from 24-hour Holter electrocardiograms (ECG) which are slow and expensive to record and analyse. Short-term (5 minutes) recordings could be of use but data for their predictive value is scarce. The aim of this study was the assessment of the prognostic significance of 5-minute recording of HRV following MI.

Methods: Subjects were recruited from 1998-2000 if presenting within 48 hours of MI (WHO criteria) in sinus rhythm. 2 HRV recordings of ≥56 consecutive RR intervals were made on admission at the bedside using a 4-pap log computer. Standard time and frequency domain measures were calculated (mean NN interval, SDNN, RMSSD, pNN50, LF, HF and total power). Notification of death was obtained through the UK Office for National Statistics, with 100% follow-up censored at 18 months from the end of recruitment. The primary outcome measure was the survival of those subjects having HRV values in the lowest quartile versus those with higher HRV values.

Results: 164 subjects were approached for inclusion. HRV data was completed in 135, 21 patients died during follow-up, all from cardiac causes (mean duration 3-0 months post-MI). Baseline characteristics were: age (63±12), male sex (70%), diabetes (8%); hypertension (33%); smoking (47%); cholesterol (5.8 ± 1.2 mmol/l); BMI 26 ± 4; family history (26%); MI characteristics were: inferior (51%); anterior (45%); LBBB not classified (4%); peak CK 1944 (±1529) U/l; post-MI LVEF ≤ 40%. Using the log-rank test, reduction in 0.5 HRV parameters was associated with an adverse outcome: mean NN (median 836 ms, 25% centile <723 ms, hazard ratio 3.75 (95% CI 1.28 - 10.95), p=0.002); SDNN (22, -14 ms, hazard ratio 3.05 (95% CI 1.04 - 8.92), p=0.01), and total power (0.23, 0.01 ms², hazard ratio 3.86 (95% CI 1.01 - 14.05), p=0.049).

Conclusion: Reduced HRV assessed post-MI using short-term 5 minute recordings is significantly associated with an adverse prognosis due to cardiovascular death.

1213-5 Prognostic Significance of Standard ECG in Nonischemic Dilated Cardiomyopathy

Wojciech Zareba, Maciej Hrusa, Georgio Dubiner, Antonio Diego De Lena, Prashanth Deedwania, Jan Ruta, Cristian Madioy, Elizabeth Carroll, University of Rochester, Rochester, NY

Background: The aim of this study was to determine the prognostic significance of a standard 12-lead ECG added to clinical variables for predicting cardiac death in patients with nonischemic dilated cardiomyopathy.

Methods: The study population consisted of 114 pts (mean age: 46±14 years; mean EF=44±8%) with nonischemic dilated cardiomyopathy and NYHA III/IV. Patients were followed for a mean of 7±6 months after initial non-contact mapping and RFCA (4 women, 44±7 years, range 22 to 55). No patients had structural heart disease or family history of dilated cardiomyopathy and RFCA. The primary outcome measure was the survival of those subjects having HRV values in the lowest quartile versus those with higher HRV values.

Results: During mean 26±15 months of follow-up, there were 26 pts (23%) who died of cardiac causes. Table shows clinical and ECG parameters, which were significantly different between survivors and cardiac death pts. Multivariate Cox analysis showed that QRS duration and RR interval were significant and independent predictors of cardiac death both in the model with those parameters as continuous variables and in the model with those variable dichotomized. Final model included: EF with hazard ratio (HR) 1.10 per 5% decrease in EF (p=0.07), RR with HR=1.68 per 100 ms increase (p=0.05), and QRS with HR=1.26 per 10 ms increase (p=0.001). The optimal values identifying high-risk patients were EF<29%, RR<765 ms, (heart rate >80 bpm), and QRS>120 ms.

Conclusion: Simple predictive model based on ECG, EF duration, and heart rate obtained from standard ECG can be used for stratifying the risk of patients with nonischemic dilated cardiomyopathy.

1213-6 ISAR HRT Substudy: Prediction of Mortality by Beat-to-Beat Variability Parameters

Patra Belth, Raphael Schneider, Axel Bauer, Kurt Lim, Georg Schmitt, 1. Medizinische Klinik & Deutsches Herzcentrum, Technische Universität München, München, Germany

Background: In the last years, makers of automatic function became important as risk factors for mortality after myocardial infarction. Goal of this study was to examine the predictive power different beat-to-beat variability parameters in postinfarction patients receiving an up-to-date treatment.

Methods: 1015 patients with acute myocardial infarction (AMI) were included. Inclusion criteria were age 75 years, and LV systolic function (EF=24+8%) with nonischemic dilated cardiomyopathy and EF<40%. Standard 12-lead ECG was used to obtain the following parameters: RR, PR, and QTc intervals, QRS duration, and presence of bundle branch blocks. Cardiac death was the primary endpoint of the study.

Results: During mean 26±15 months of follow-up, there were 26 pts (23%) who died of cardiac causes. Table shows clinical and ECG parameters, which were significantly different between survivors and cardiac death pts. Multivariate Cox analysis showed that QRS duration and RR interval were significant and independent predictors of cardiac death both in the model with those parameters as continuous variables and in the model with those variable dichotomized. Final model included: EF with hazard ratio (HR) 1.10 per 5% decrease in EF (p=0.07), RR with HR=1.68 per 100 ms increase (p=0.05), and QRS with HR=1.26 per 10 ms increase (p=0.001). The optimal values identifying high-risk patients were EF<29%, RR<765 ms, (heart rate >80 bpm), and QRS>120 ms.

Conclusion: Simple predictive model based on ECG, EF duration, and heart rate obtained from standard ECG can be used for stratifying the risk of patients with nonischemic dilated cardiomyopathy.