nificant change in dysynchrony after CRT-D (Δ 35±206ms, p=0.38) despite a modest, but significant improvement in EF (Δ 4±7% EF increase, p<0.01). VAs occurred in patients who either lacked baseline dysynchrony, or lacked improvement in dysynchrony after CRT-D.

Conclusions: Reorganization of baseline dysynchrony was a marker of freedom from VAs in CRT treated HF patients. VAs occurred in patients who had not changed baseline dysynchrony, despite modest improvements in EF. These observations suggest that improvements in mechanical dysynchrony by CRT reduce the risk of VAs in addition to the favorable effect on cardiac remodeling.

P3154 | BEDSIDE

More frequent optimization by the adaptive crt algorithm in patients with higher daily activity: analysis of the adaptive crt trial

B. Lemke1, A. Kloppe2, D. Birnie3, K. Aroma4, H. Krum5, K.L. Fun Lee6, M. Gasparini7, R. Starling8, J. Gorcsan9, D.O. Martin8 on behalf of Adaptive Institute, Ottawa, ON, Canada; 4Tsukuba Medical Center Hospital, Department of Cardiology, Tsukuba, Japan; 5Monash Centre of Cardiovascular Research & Education in Therapeutics, Melbourne, Australia; 2Queen Mary Hospital, Department of Medicine, Division of Cardiology - The University of Hong Kong, Hong Kong, Hong Kong SAR, People’s Republic of China; 3Clinical Institute of Cardiovascular Research & Education in Therapeutics, Melbourne, Australia; 1University of Ottawa Heart Institute, Ottawa, ON, Canada; and 9Department of Cardiology, Tsukuba, Japan.

Monash Centre of Cardiovascular Research & Education in Therapeutics, Melbourne, Australia; 2Queen Mary Hospital, Department of Medicine, Division of Cardiology - The University of Hong Kong, Hong Kong, Hong Kong SAR, People’s Republic of China; 3Clinical Institute of Cardiovascular Research & Education in Therapeutics, Melbourne, Australia; 1University of Ottawa Heart Institute, Ottawa, ON, Canada; and 9Department of Cardiology, Tsukuba, Japan.

Purpose: The benefit of CRT can be improved through optimization of its pacing parameters. Adaptive CRT algorithm (aCRT) evaluates intrinsic electrical conduction once every minute and provides either LV or BIV pacing with dynamically optimized AV and VV delays. Safety and clinical efficacy of the aCRT has been demonstrated in the Adaptive CRT trial. We investigated whether the frequency of the AV delay adjustments by the algorithm was related to patients daily activity.

Methods: Daily activity is measured by a sensor as a percentage of the day when the activity exceeds a certain threshold. For each patient an average daily activity over the FU (20±5.7 months) was calculated. Patients (n=314) were stratified into 4 quartiles according to their average daily activity. We calculated: a) the percent of the once-a-minute algorithm conduction measurements which led to a subsequent adjustment in the device AV delay and b) the percent of patients who improved in Packer’s Clinical Composite Score (CCS) and worsened from pre-implant to FU: c) changes in the LV EF and left-ventricular end-systolic index (LV ESVI) over the 12-month FU. The F-test was used to compare the means across the quartiles.

Results: Patients in higher quartiles of the daily activity levels had greater frequency of AV delay adjustments by the aCRT and were characterized by a greater proportion of responders to CRT as defined by the improvement in CCS. There were no significant differences in LV EF and LV ESVI changes across patient activity quartiles.

Conclusions: Patients with higher activity experience more frequent adjustments of AV delays by the Adaptive CRT algorithm and are characterized by a greater improvement in clinical condition.

P3155 | BEDSIDE

Fusion of electrical wave fronts in cardiac resynchronization therapy predicts response: an acute pressure-volume loop study

L. Wu, C.P. Allarta, G.J. De Roest, M.L. Hendriks, A.C. Van Rossum, C.C. De Cook, VU University Medical Center, Amsterdam, Netherlands

Purpose: In cardiac resynchronization therapy (CRT), the contribution of right ventricular (RV) stimulation to overall pump function remains controversial. Recent research suggests that in patients with left bundle branch block, eligible for CRT, optimal hemodynamic benefit can be obtained by fusion of the intrinsic (right bundle branch (RBB) wave front) and the invoked wave front of left ventricular (LV) pacing. RV stimulation would only be necessary in patients with long intrinsic AV-delays since in such cases fusion with the intrinsic RBB wave front would compromise optimal AV-delay. To evaluate this hypothesis, we conducted acute hemodynamic measurements in CRT patients with varying AV-delays during LV only and biventricular (Biv) pacing.

Methods: Patients eligible to CRT were included. Prior to CRT implantation, patients underwent a temporary pacing procedure. Temporary leads were placed in the right atrium, RV and at the posterolateral wall, and a conductance catheter with pressure transducer were placed in the left ventricular pressure and volume data. Stroke work (SW) and dP/dtmax were used to assess acute hemodynamic response during RV, LV and Biv pacing. Pacing was performed with a fixed AV-delay of 100ms. Analyses were done for the total study population, as well as for a normal AV-delay and first degree AV-block group.

Results: Fifty-seven patients were included (37 (65%) males, age 67±10 years, LVEF 22±13%, QRS 154±21ms, ischemic cardiomyopathy 35 (61%) patients, AV-delay 189±34ms, 18 (32%) first degree AV-block). A positive correlation was observed between AV-delay and SW response to LV only pacing (R2 = 0.08, p = 0.032). No correlation was found during Biv pacing nor in dP/dtmax response. No significant differences were found in SW and dP/dtmax response between LV only and biv pacing in the normal AV-delay group (mean 170±18ms) (ΔSW 35±40% vs 31±50%, p=0.415; Δ dP/dtmax 8±18% vs 12±25%, p=0.258, respectively) and the first degree AV-block group (mean 230±23ms) (ΔSW 45±43% vs 30±46%, p=0.124; Δ dP/dtmax 7±14% vs 5±27%, p=0.652, respectively).

Conclusion: The present study revealed that a longer AV-delay was positively correlated with SW response during LV, possibly due to AV optimisation. No differences in acute hemodynamic response were found between both pacing modalities in the normal and first degree AV-block group, suggesting that wave front fusion either by biventricular pacing or by fusion of LV pacing and intrinsic conduction is of minor importance.

P3156 | BEDSIDE

Persistent reverse remodelling in CRT-D patients: long-term results

B.A. Schaer, S. Frey, M. Kuhne, S. Osswald, C. Sticherling. University Hospital Basel, Department of Cardiology, Basel, Switzerland

Background: After implantation of CRT devices, reductions in left ventricular volumes and increase of Left Ventricular Ejection Fraction (LVEF) have been shown. The former is important for the determination of response, the latter for the risk of life-threatening arrhythmias. Persistent improvement of LVEF above 35% might lead to thoughts about downgrading to CRT-P in some pts at battery depletion. Most publications have only a short follow-up of up to 1 yr and long-term results are scarce.

Methods: All pts who received a CRT-D at our hospital between February 2000 and June 2011 were identified. We collected data on every single available echocardiography. LVEF values used for calculation were grouped to baseline (EF at implant) and yearly intervals (±6 months). We also identified pts who permanently improved their LVEF to ≥35% and to ≥50%.

Results: From 2002 pts, 24 (12%) were excluded due to missing data, thus 178 pts were analysed. Age 65±10 years, 25 (14%) female, 77 pts had ischemic cardiomyopathy (43%), follow-up 65±31 months. 667 echocardiographies available. LVEF at implant was 26±8% and increased to 34±12% (n=143), 35±12% (n=122), 37±12% (n=77) after 1, 2 and 3 years. After five years of follow-up LVEF was 34±12% (n=33). 85 patients (48%) permanently increased their ejection fraction to ≥35% and 20 (11%) to ≥50%. Evolution of LVEF over time is shown in figure. No difference was seen with regard to the underlying cardiomyopathy (permanent increased to ≥35% or ≥50%; ischemic 42% and 8%, non-ischemic 53% and 14%, p value 0.2).

Conclusion: After implantation of a CRT device, the mean ejection fraction increased from 26% to 34% after one year and remained stable over time up to 5 years. Almost half of the patients (48%) exhibited a permanent increase to ≥35%.