without significant changes in myocardial perfusion in some studies estimated with positron emission tomography (PET). We investigated the predictive value of FDG-PET and MIBI-SPECT for the prognosis of patients treated with CRT.

Methods: FDG-PET and MIBI-SPECT had been performed in eight patients (6 male, mean age 69 ± 7.4 <SD> years old) before implantation of biventricular pacemaker. The left ventricle was divided into 18 segments of 3 short axial images and 2 segments of 1 vertical long axial image (total 20 segments). FDG-PET and MIBI-SPECT were visually assessed by 5 point scale; 5 = absence of tracer uptake, 3 = severe defect, 2 = moderate defect, 1 = mild defect, 0 = normal uptake. A match pattern is defined as the reduced perfusion image similar to glucose uptake, a mismatch pattern is the reduced perfusion image than the glucose uptake, and a reverse mismatch pattern is the reduced glucose uptake than the perfusion image. The total number of match, mismatch, and reverse mismatch segments and summed difference score (SDS; the sum total of the score of FDG - MIBI) in each four areas (septal, anterior, lateral, inferior) were compared between survival and non-survival group.

Results: Three patients died because of heart failure during follow-up. The number of reverse mismatch segments in septum in survival group was greater than that in non-survival group (2.4 ± 1.1 vs 0.33 ± 0.6, p<0.05). SDS in septum showed higher value in survival group than that in non-survival group (2.2 ± 1.6 vs -0.67 ± 1.2, p<0.05).

Conclusions: The evidence of reverse perfusion-metabolism mismatch in septum is the predictor of good prognosis of patients treated with CRT.

415 Evaluation of cardiac resynchronization using gated myocardial perfusion single photon emission computed tomography

Y. Wakuyma 1, M. Okihara 2, H. Osumi 1, J. Okomo 1, K. Kamagata 2, K. Tsuchida 1, S. Baba 1, T. Shinozaki 1, J. Watanabe 1, K. Shirato 1

1 Tohoku University School of Medicine, Dept of Cardiovascular Medicine, Sendai, Japan; 2 Tohoku University School of Medicine, Dept of Cardiovascular Medicine, Sendai, Japan

Background: Evaluation of left ventricular (LV) dyssynchrony is important to select candidates for cardiac resynchronization therapy (CRT). Methods: In 8 heart failure patients with recent CRT, 16-interval electrocardiogram-gated single photon emission computed tomography (SPECT) with 99mTc-sestamibi was performed during biventricular pacing (CRT-ON) and immediately after turning CRT off (CRT-OFF). The commercially available Quantitative Gated SPECT (QGS) software was used to represent a 3D LV surface movie and to score regional myocardial perfusion (MP) and wall thickening (WT).

Results: The New York Heart Association class improved in all patients after CRT (from 3.2±0.2 to 2.1±0.1; p<0.05). The LV ejection fraction, end-diastolic and end-systolic volume calculated by QGS did not differ between CRT-ON and CRT-OFF. With the visual analysis of the 3D movies during CRT-OFF, we could easily recognize LV dyssynchrony; i.e. LV swinging and/or septal wall bulging, which was indicated quantitatively as the decreased ratio of septal-to-lateral WT (S-WT/L-WT).

Although the regional MP did not change between CRT-ON and CRT-OFF, the ratio of S-WT/L-WT significantly increased during CRT ON compared with that during CRT-OFF (CRT-ON: 0.92±0.18 vs. CRT-OFF: 0.60±0.18; p<0.05), indicating synchronous LV wall thickening during CRT-ON. The S-WT/L-WT during CRT-OFF tends to inversely correlate the increment of S-WT/L-WT with CRT-ON (r=0.60, p<0.01; figure).

Conclusions: The 3D evaluation by QGS demonstrates improvement in LV dys synchrony with CRT and may be useful to select CRT candidates.

416 Effect of cardiac resynchronization therapy on atrial reverse remodeling using three dimensional echocardiography

O. Sourrouille 1, P. Sourrouille 1, O. Sourrouille 1

1 University of Sydney, Surgery, Sydney, Australia; 2 SCH Cardiac Hospice, Cardiology, Tehran, Iran (Islamic Republic of); 3 Minneapolis, United States of America

Introduction: Cardiac resynchronization therapy (CRT) has been proven to improve ventricular hemodynamics in heart failure and left ventricular reverse remodeling. However, the role of this therapy has not yet been fully examined on left atrial volumes and hemodynamics. In this study changes in left atrial total emptying fraction and reverse remodeling has been examined using three dimensional echocardiography.

Methods: Forty four patients with ejection fraction <35%, LBBB underwent CRT implantation. The patients were randomized to a control and a therapy group with half the patients receiving CRT therapy. Two and three dimensional echocardiographies were performed at implant and three months after implantation. With the use of segmentation and 3 dimensional echocardiography let ventricular end diastolic fraction (LVEDV) and left ventricular end systolic (LVESV) volumes as well as left atrial minimal volumes and Volumes (LAMinV) and maximum volumes (LAMaxV) were calculated left atrial total ejection fraction (LATEF) was calculated at baseline and 3 months. The two groups were switched over at the end of the 3 months.

Results: Using three dimensional echocardiography, LVEDV and LVESV decreased by 26% and 31% respectively. LAMinV and LAMaxV decreased by 21% and 24% respectively. LATEF increased by 21% for the therapy group. No significant changes were noted in the control group.

Conclusions: In addition to its beneficial effect on LV haemodynamics, CRT has a significant affect on left atrial volumes, left atrial reverse remodelling and diameters as well as LATEF, which may be the result of improvement of LA contraction, reduction of left ventricular end-systolic and end-diastolic volumes and decreased mitral regurgitation.

417 Sustained symptomatic, haemodynamic and sympathetic nerve improvement after thoracoscopic cardiac resynchronisation therapy in congestive heart failure

B. Najem 1, N. Preumont 1, P. Unger 1, A. Houssi 1, O. Xhaet 1, J.-L. Jansens 2, E. Stoupel 1, P. Van de Borne 1

1 Erasme Hospital, Cardiology, Brussels, Belgium; 2 Erasme Hospital, Cardiac Surgery, Brussels, Belgium

Introduction: The hemodynamic, clinical and neurohumoral benefits of robotic-enhanced thoracoscopic cardiac resynchronisation therapy (TCRT) in congestive heart failure (CHF) are unknown. We tested the hypothesis that TCRT improves cardiac hemodynamics, functional status and muscle sympathetic nerve activity (MSNA) in patients with CHF.

Method: Ten CHF patients with cardiac asynchrony (ASY), 13 matched patients resynchronised by TCRT (SYN) 7±2 months prior to study inclusion, and 9 matched healthy subjects (CTRL) underwent blood pressure and MSNA recordings. Functional status, cardiac index and left ventricular ejection fraction (LVEF) were assessed in the patients.

Results: SYN patients had shorter QRS and interventricular mechanical delays than ASY patients (both p<0.01). SYN patients had longer 6 minute walking distances (p<0.05) and lower NYHA classes (p<0.05) than ASY patients. MSNA of 56±2 bursts/min in ASY patients was higher than in SYN patients (48±3 bursts/min, p<0.05) and CTRL (42±3 bursts/min, p<0.01). Arterial blood pressure was lower in both CHF patient groups than in the CTRL (both p<0.05). Cardiac index