



Abstract 80 Figure 1 PPCI nurse LED discharge protocol.

## 81 DYSSYNCHRONOUS THREE PLANE MOTION AND IMPAIRED LEFT VENTRICULAR TWIST IN PATIENTS WITH HEART FAILURE AND NORMAL EJECTION FRACTION

doi:10.1136/heartjnl-2011-300198.81

<sup>1</sup>Y T Tan, <sup>2</sup>F W G Wenzelburger, <sup>3</sup>F Leyva, <sup>3</sup>J E Sanderson. <sup>1</sup>Department of Cardiovascular Medicine, Birmingham, UK; <sup>2</sup>Institute for Science and Technology in Medicine, Keele University, Stoke on Trent, Keele, UK; <sup>3</sup>Department of Cardiovascular Medicine, University of Birmingham, Birmingham, UK

**Background** The pathophysiology of heart failure with normal ejection fraction (HFNEF) is complex and not fully understood. Recent publications showed a loss of apical rotation and longitudinal function particularly on exercise in these patients. Whether a deterioration of basal rotation and a dyssynchrony of different three plane motions on exercise might contribute to symptoms in these patients is not known.

**Method** 72 Patients (age  $73 \pm 7$  years, 48 female) with breathlessness on exertion and normal EF ( $60 \pm 7\%$ ) underwent cardiopulmonary exercise test to rule out alternative clinical reasons ( $\text{VO}_2\text{max}$   $18.4 \pm 4.9$  ml/min/kg). Data were compared to 38 age-matched control subjects (age  $71 \pm 7$  years, 29 female, EF  $63 \pm 7\%$ ) with a normal exercise tolerance ( $\text{VO}_2\text{max}$   $28.6 \pm 5.1$  ml/min/kg). All underwent full Doppler 2D-echocardiography at rest and on supine exercise. Echo images were analysed off-line. Apical and basal rotation, longitudinal and radial displacement were measured by speckle tracking. Speckle tracking pictures and colour TDI curves were loaded into custom made software. The software interpolated all curves and calculated twist as the difference of rotation at apex and at base. The software offered timing information to calculate SD and time delays for different motions.

**Results** As previously described apical rotation was reduced at rest and on exercise. Basal rotation was comparable at rest but significantly reduced on exercise in patients. The SD for four different systolic peak motions (basal and apical rotation, longitudinal and radial displacement) was comparable at rest but on exercise controls showed a significantly reduced SD compared to patients showing a greater ability to synchronise motions. Furthermore a ratio of untwist during IVRT and longitudinal extension (Ratio Untwist/Extension in IVRT) showed a significant deeper slope on exercise for patients indicating a loss of synchrony in diastole, too. All results are presented in Abstract 81 table 1.

Abstract 81 Table 1

	Patients Rest	Controls Rest	p value	Patients Exercise	Controls Exercise	p value
Apical Rotation (°)	$9.9 \pm 4.4$	$13.4 \pm 4.0$	<0.001	$12.5 \pm 4.7$	$16.6 \pm 3.9$	<0.001
Basal Rotation (°)	$-8.3 \pm 3.3$	$-8.0 \pm 3.4$	0.676	$-7.7 \pm 3.2$	$-9.7 \pm 3.0$	0.011
Twist (°)	$18.0 \pm 5.7$	$21.0 \pm 4.9$	0.01	$19.5 \pm 5.9$	$25.9 \pm 6.0$	<0.001
SD Systolic Motions (ms)	$48.6 \pm 32.9$	$43.1 \pm 25.3$	0.38	$40.1 \pm 27.1$	$25.9 \pm 15.5$	0.01
Ratio Untwist/Extension in IVRT (°/mm)	$25.3 \pm 51.4$	$7.1 \pm 10.7$	0.059	$9.6 \pm 14.7$	$3.3 \pm 3.8$	0.034

**Conclusion** Patients with HFNEF show a deterioration of basal rotation and a systolic and diastolic three plane dyssynchrony particularly on exercise. This might further contribute to the deterioration of early diastolic suction and therefore decrease stroke volume on exercise. This might be a major contribution to their symptoms.

82

## MANAGEMENT OF ADVANCED HEART FAILURE IN THE UK: TRENDS IN HEART TRANSPLANTATION AND MECHANICAL CIRCULATORY SUPPORT

doi:10.1136/heartjnl-2011-300198.82

<sup>1</sup>A Emin, <sup>2</sup>C A Rogers, <sup>3</sup>H L Thomas, <sup>4</sup>S Tsui, <sup>5</sup>S Schueler, <sup>5</sup>G MacGowan, <sup>6</sup>A Simon, <sup>7</sup>R S Bonser, <sup>4</sup>J Parameshwar, <sup>8</sup>N R Banner. <sup>1</sup>Clinical Effectiveness Unit, The Royal College of Surgeons of England, London, UK; <sup>2</sup>Clinical Trials and Evaluation Unit, University of Bristol, Bristol, UK; <sup>3</sup>NHS Blood and Transplant, Bristol, UK; <sup>4</sup>Cardiopulmonary Transplantation, Papworth Hospital NHS Foundation Trust, Cambridge, UK; <sup>5</sup>Cardiopulmonary Transplantation, Freeman Hospital, Newcastle, UK; <sup>6</sup>Heart and Lung Transplantation, Royal Brompton and Harefield NHS Trust, Middlesex, UK; <sup>7</sup>Cardiopulmonary Transplantation, Queen Elizabeth Hospital, University of Birmingham, Birmingham, UK; <sup>8</sup>Royal Brompton and Harefield NHS Trust - on behalf of the UK VAD Forum and UKCTA Steering Group, Middlesex, UK

**Introduction** Patients with advanced heart failure due to systolic ventricular dysfunction require "pump replacement" therapy. Previously, heart transplantation (HTx) met this need but waiting times have increased due to shortage of donor hearts. Consequently, more patients require a ventricular assist device (VAD) as a bridge to transplant (BTT). We report UK activity, trends and outcome for HTx and BTT VAD.

**Methods** Data were acquired from a comprehensive national database using 3 eras for analysis: E1: 5/2002–12/2004, E2: 1/2005–12/2007 & E3: 1/2008–6/2010. Paediatric and multi-organ transplants were excluded from the transplant cohort. Patients who received prior short-term support (bridge to bridge) were excluded from the VAD group.

**Results** 1278 patients were listed for HTx over the 3 eras: E1 155 per year, E2 165 per year, E3 148 per year. The number of adult HTx fell from 132 per year in E1 to 94 per year in E3. The median waiting time for non-urgent HTx increased from 87 days in E1 (95%CI 55 to 119) to 321 days in E3 (95%CI 203 to 439) ( $p < 0.001$ ). 239 patients needed left VAD support as BTT; 75 (31%) also received a right VAD. Activity rose from 26 per year in E1 to 41 per year in E3. Device