Methods: Twenty consecutive subjects underwent electro-physiological study due to arrhythmia were enrolled. The regional cardiac synchronicity assessed by Two-Dimensional Tissue Tracking (2D'TT) machine (EPI-8500, HITACHI Medical Corporation), and the coronary flow in the left anterior descending artery (LAD) measured by a Doppler guide wire were compared between RVOT pacing and RVA pacing at 100 bpm.

Results: QRS duration during RVOT pacing than RVA pacing (124±15 msec vs 162±15 msec, p<0.01) and there were no significant difference in aortic blood pressure between RVOT pacing and RVA pacing. Intraventricular contraction delay between septal and lateral wall assessed by 2D'TT machine during RVOT pacing was shorter than that during RVA pacing (99±9 msec vs 142±11 msec, p<0.01). Averaged peak velocity (APV) of coronary flow during RVOT pacing was greater than that during RVA pacing in hypopemia (54±18 cm/sec vs 47±17 cm/sec, p<0.05) and rest (24±10 cm/sec vs 21±10 cm/sec, p<0.05), but there were no significant difference in coronary flow reserve between RVOT pacing and RVA pacing (2.5±0.8 vs 2.4±0.6). LV stroke volume assessed by echocardiography during RVOT pacing was greater than that during RVA pacing (49.2±7.3 ml vs 38.8±7.2 ml, p<0.05). Besides, microvascular resistance index (which was calculated as the blood pressure at hyperemia divided by the hyperemic APV) during RVOT pacing was lower than that during RVA pacing (2.0±0.8 vs 2.4±1.1, p<0.05).

Conclusions: RVOT pacing could improve dyssynchrony and coronary flow during RVOT pacing could be greater than during RVA pacing. The increase of coronary flow might be related to the increase of LV output and decrease of microvascular resistance by improvement of LV dyssynchrony.

HEART FAILURE – RESYNCHRONISATION

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How many patients with long-term right ventricular apical pacing are eligible to upgrading to biventricular pacing?

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Deletiorous effects of right ventricular apical (RVA) pacing favoured by abnormal LV activation sequence are reported. Biventricular pacing (BVP) may be a method to reverse these effects. The aim of the study was to evaluate how often the systolic dyssynchrony and indications to BVP are present in patients with permanent RVA pacing and to find out which baseline parameters suggest the need of upgrading to BVP system.

Methods: We screened 152 consecutive, RVA-paced patients admitted to our department for elective pacemaker replacement from June to November 2005 for eligibility for BVP (heart failure NYHA class III or IV admitted to our department for elective pacemaker replacement from June

Results: Among 87 non-PM-dependent patients 2 (2.3%) met the criteria for BVP.

Conclusions: RVA preejection intervals exceeding 40 ms was present in 40 (62%) pts. LVEF 35% and echo-evaluated systolic function in 88% and 86%, resp. ATM may therefore serve as a new parameter of LV asynchrony, e.g. in the context of resynchronization therapy. Further studies are needed to evaluate its clinical potential.

LV FUNCTION – OTHER

913
Heart rate regularity through by permanent ventricular pacing in patients with chronic atrial fibrillation unfavorably affects the ventricular function compared to irregular intrinsic conduction

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Background: In atrial fibrillation (AF), the irregular ventricular response itself contributes to the unfavorable effects of the arrhythmia. One possible option to achieve rate regularization is by means of overdrive right ventricular pacing. However, any benefits may be counteracted by the adverse effects of the pacing-induced ventricular dyssynchrony.

Objective: We investigated the impact of rate regularization through permanent pacing on the net cardiac function in patients with chronic AF and normal left ventricular systolic function assigned to stable rate control pharmacologic strategy.

MYOCARDIAL VELOCITY IMAGING (DMI) – LV FUNCTION

914
Apical translversal motion display - A novel tool to assess ventricular asynchrony

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Currently, left ventricular (LV) asynchrony is expressed as time-delay of regional velocities, independent of the remaining myocardial function. We hypothesize, that apical transversional motion (ATM) is an integrative parameter reflecting regional function. In this study we investigated this new parameter in different conduction delays.

Methods: We examined 50 persons, 11 patients with post-infarct (LBBB, QRS 155±19 ms) and 20 patients with non-ischaemic left bundle branch block (LBBB, QRS 167±19 ms), 11 patients with right bundle branch block (RBBB, QRS 150±13 ms) and 16 healthy volunteers (NORM, QRS 98±9 ms). Colour tissue Doppler data of 3 heart cycles were acquired from an apical 2-, 3- and 4-chamber view. An ATM trace was calculated from apical motion curves of the six LV walls and displayed in a polar coordinate system by custom made research software. Main direction and amplitude of the ATM trace was compared among the groups.

Results: Mean QRS width was not sign. different between BBB groups, but sign. higher than in NORM (p<0.01). Mean ATM was 1.7±0.7 mm in NORM, 1.3±0.4 mm in RBBB (ns), 2.6±1.7 in LBBB (ns) and 4.2±1.8 mm in LBBB (p<0.001 vs NORM and RSB, p<0.05 vs LBBB). ATM of BBB patients did not correlate with QRS width or ejection fraction. Patients with LBBB were clearly identified by a typical ATM pattern. A cut-off of 3 mm motion amplitude separated LBBB from all other groups with a sensitivity and specificity of 88% and 86%, resp.

Conclusion: Assessing LV asynchrony by ATM is feasible. ATM considers the amplitude of asynchronous myocardial motion and, thus, reflects remaining function. ATM may therefore serve as a new parameter of LV asynchrony, e.g. in the context of resynchronization therapy. Further studies are needed to evaluate its clinical potential.