Analysis of longitudinal strain integrals during rest and effort on heart failure patients


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to the left ventricle during exercise. Integrals to minimum of longitudinal strain decreased significantly between rest and exercise for mid-septal segments (1.96±1.30 vs. 0.90±1.36), no variation was observed for mid-lateral segments (1.96±1.22 vs. 2.04±1.02, P<0.01). CRT responders showed an increase in integral to minimum for the mid-lateral segment (1.64±0.90 at rest vs. 2.26±1.20 at exercise; P<0.01) whereas CRT non-responders did not. The latter showed a decrease in integral to minimum for mid-septal segment during exercise (2.11±1.36 vs. 1.30±0.89; P<0.01) that was not observed on CRT responders.

Conclusion.— Integral-derived longitudinal strain curves give new insights into LV mechanics for heart failure patients during exercise, revealing different patterns between the septum and the lateral wall. These patterns may be useful to identify potential CRT responders.

http://dx.doi.org/10.1016/j.acvcd.2013.03.005

Value of speckle tracking for the assessment of right ventricular function in operated tetralogy of Fallot. Comparison with MRI

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Objectives.— Right ventricular (RV) function is a major prognostic factor in patients (pts) with operated tetralogy of Fallot (TOF). We compared the results of RV speckle tracking (2D strain) with those of magnetic resonance imaging (MRI) in this setting.

Methods.— At transthoracic echocardiogram, RV fractional area change (RVFAC), tricuspid annular plane systolic excursion (TAPSE), velocity of S wave at tricuspid annulus with tissue Doppler and 2D strain (longitudinal maximal systolic strain) were recorded in the apical 4-chamber view. Measurements were made off-line by two independent observers. Echocardiographic results were compared to RV indexed end diastolic volume (EDVI), indexed end systolic volume (ESVI) and RV ejection fraction (EF) at MRI.

Results.— Twenty-two pts (16M, 6F) aged 11—62 yrs (mean 23.2±10.8) were included. Parameters of RV systolic function were as follows: RVFAC = 40 ± 10 %, TAPSE = 18 ± 4 mm, S wave = 10 ± 0.2 cm/sec and RV EF at MRI = 43 ± 11 %. Global RV longitudinal systolic strain (GLS) was −15.5 ± 4.2 %, RV free wall strain was −15.1 ± 6.3 % and septal strain was −15.8 ± 3.8 % on average for the whole group. Echo indexed RV end diastolic area correlated with EDVI at MRI (r = 0.73), as well as echo indexed RV end systolic area and ESVI at MRI (r = 0.71). Global RV 2D strain correlated well with RV EF: r = 0.68, P < 0.05, and with ESVI at MRI: r = 0.63. Feasibility, intra- and interobserver reproducibility of 2D strain were adequate.

Conclusions.— Speckle tracking is a promising new method to improve estimation of RV systolic function in pts operated on for TOF (Fig. 1).
Echocardiographic predictors of cardiovascular events in a population of subjects aged over 65 years: Preliminary results
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Background.— The left atrium is a marker of clinical and subclinical cardiovascular disease. The additional role of left atrial (LA) and left ventricular (LV) speckle-derived strain parameters has not been assessed in an aged population, included in a prospective cohort of subjects with a long-term follow-up.

Objectives.— To determine whether LV and LA global strain is a predictor of cardiovascular events in a population, beyond other clinical and morphological characteristics.

Methods and results.— The COVADIS study aims to analyse the relationship between cardiac and cerebral ageing, studied multidimensionnally (biology, MRI, echocardiography), and the determinants of cognitive impairment. We performed a complete echocardiographic examination and measured LV and LA peak systolic global longitudinal strain using a semi-automatic speckle tracking software in 85 subjects aged over 65 years. The endpoint was a composite cardiovascular (CV) criterion of coronary event, stroke or death. In univariate analysis, the main predictors of CV events are depicted in the table. The Kaplan-Meier curves show that LA area > 20 cm² was associated with a higher risk of CV events. Multivariate analysis could not be performed due to the low number of CV events. LV and LA peak systolic global longitudinal strains were not associated with CV events.

Conclusion.— These early and preliminary results confirm the feasibility and reproducibility of deformation measurements in this population, although not associated with CV events, and is currently extended to a cohort of over 2000 patients.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Univariate analysis HR (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>1.04 (0.90—1.20)</td>
<td>0.596</td>
</tr>
<tr>
<td>Gender, female</td>
<td>0.13(0.03—0.63)</td>
<td>0.011</td>
</tr>
<tr>
<td>LA area &gt; 20 cm²</td>
<td>9.90 (2.37—41.41)</td>
<td>0.002</td>
</tr>
<tr>
<td>EDV indexed</td>
<td>1.06 (1.00—1.13)</td>
<td>0.051</td>
</tr>
<tr>
<td>LVEF (biplane)</td>
<td>0.92 (0.83—1.00)</td>
<td>0.044</td>
</tr>
</tbody>
</table>

Ultrasound based teaching of cardiac anatomy and physiology to undergraduate medical students
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Background.— Ultrasonography is a non-invasive imaging modality that offers the opportunity to teach living cardiac anatomy and physiology. The objectives of this study are to assess the feasibility of integrating an ultrasound based course to the conventional undergraduate medical teaching program and to analyze students’ and teachers’ feedbacks.

Methods.— An ultrasound based teaching course was implemented and proposed to all second ear medical students (n = 348) at the end of the academic year and after all the conventional modules at our faculty. After a brief theoretical and practical demonstration, students were allowed to take the probe and use the ultrasound machine. Students and teachers were asked to complete a survey and were given the opportunity to provide open feedback.

Results.— Two months were required to implement the entire module and 330 (95%) students divided into 39 groups, and 37 teachers participated to the course. The students’ feedbacks were very positive: 98% of them agreed that the course was useful; 85% and 74% respectively considered that their understandings of cardiac anatomy and physiology were improved. A majority of the teachers (97%) considered that the students were interested, 81% agreed that