P13 - Posters - Echocardiography

35 **Hyperechoic Myocardium: A New Noninvasive Marker of High Rsk Patients in Hypertrophic Cardiomyopathy with Magnetic Resonance Correlation**

I. Cohen, A. Hagege, E. Mousseaux, E. Messas, M. Desnos
Paris

36 **Comparison between 2D-Echo Myocardial Strain and Visual Grading of Myocardial Function in Patients after Myocardial Infarction**

S. Carasso, Y. Agmon, D. Mutlak, A. Roguin, J. Lessick
Haifa

37 **Characterization of Patients with Pulmonary Hypertension According to Pulmonary Capillary Wedge Pressure and Pulmonary Vascular Resistance: A Doppler Echocardiographic Study**

M. Wolyvovics [1,2], M. Boaz [2], M. Roller [1], Y. Rozenman [2]
[1] Bat-Yam, [2] Holon

Hyperechoic Myocardium: A New Noninvasive Marker of High Rsk Patients in Hypertrophic Cardiomyopathy with Magnetic Resonance Correlation

Iris Cohen [1], Alain Hagege [1], Elie Mousseaux [2], Emmanuel Messas [1], Michel Desnos [1]

[1] *Cardiology Department, Noninvasive,* [2] *Cardiology Department, Imaging, HEGP, Paris, France*

Cardiac magnetic resonance imaging (CMR) late gadolinium enhancement (LGE) is frequent in hypertrophic cardiomyopathy (HCM) and is associated with clinical markers of sudden cardiac death (SCD) risk and progression towards heart failure

Purpose: To determine the frequency and significance of myocardial hyperechoic areas in HCM and to correlate them to LGE, a well established technique for myocardial fibrosis detection

Methods: To compare the presence and extension of hyperechoic and LGE myocardial regions, both ultrasonic and CMR studies were performed blindly and prospectively in 32 consecutive HCM adult patients, excluding previous septal ablation, coronary artery disease and contra-indication to CMR.

Results: Hyperechoic regions were found in 53.1% and LGE regions in 81.3% of the patients. The sensitivity, specificity, negative and positive predictive values and accuracy of presence of hyperechoic myocardium for detection of LGE regions were 61.5, 83.3, 33.3, 94.1 and 65.6%, respectively (r=0.57 to 0.74). While echo almost systematically underestimated LGE extent, total hyperechoic area correlated positively with the magnitude of ventricular hypertrophy, left atrial and ventricular sizes and decreased ejection fraction, and was larger in patients with > 2 SCD risk factors (p=0.04).

Conclusions: In HCM, 1) hyperechoic myocardium corresponds with CMR late-enhancement; 2) The sensitivity for such a detection is relatively low, but its positive predictive value is high; 3) Even if the area of hyperechoic myocardium underestimates LGE extent, the presence of large areas might help to target high-risk patients for SCD and heart failure. This new ultrasonic sign seems a promising tool for serial non-invasive evaluations and/or in case of contra-indication to CMR.

Typical septal hyperechoic region.

Comparison between 2D-Echo Myocardial Strain and Visual Grading of Myocardial Function in Patients after Myocardial Infarction

Shemy Carasso, Yoram Agmon, Diab Mutlak, Ariel Roguin, Jonathan Lessick

Cardiology Department, Rambam Health Care Campus, Haifa, Israel

Background: Recently quantification of myocardial regional systolic function has been enabled by 2D speckle-based myocardial strain and strain-rate (SR) analysis; however the relationship between strain values and semi-quantitative visual analysis (SVA) is not well validated, nor is its ability to measure changes in function over time.

Methods: 20 patients following revascularised acute ST elevation myocardial infarction underwent echocardiography 2-4 days post-infarction and 4 months later to evaluate improvement in myocardial function. Using a 16 segment model, each segment was graded visually (1-3) and longitudinal systolic ST and SR calculated. Strain and SR Values were averaged for each wall (3 segments per wall).

Results: Preliminary analysis of the first 6 patients (36 segments x 2 studies) is presented. Moderately good correlations were found between SVA and strain (r=0.73) and between SVA and SR (r=0.64). Mean ± SD ST and SR relative to visual grades were:

Visual Grade	Strain	Strain rate
1	-19±4	-1.0±0.3
1.1-1.5	-15.7±4.0	-0.8±0.2
1.6-2.0	-11.2±3.0	-0.6±0.2
2.1-2.5	-10.2±2.6	-0.6±0.1
2.5-3.0	-7.7±1.9	-0.5±0.2

Change in visual grade also correlated with change in strain (r=0.58) and SR (r=0.35), but not with diastolic SR (r=-0.11).

Conclusion: Our results indicate a moderately good correlation between quantitative strain and visual analysis; however fairly large confidence intervals do not permit definitive thresholds for different echo grades. The technique shows some promise in its ability to measure temporal changes in regional function.

Characterization of Patients with Pulmonary Hypertension According to Pulmonary Capillary Wedge Pressure and Pulmonary Vascular Resistance: A Doppler Echocardiographic Study

Mendel Wolyvovics [1,3], Mona Boaz [2], Milton Roller [1], Yoseph Rozenman [3]

[1] *Cardiology - Batyamon, Clalit Health Services, Bat-Yam,* [2] *Epidemyology Department, E. Wolfson Medical Center, Holon,* [3] *Heart Institute, E. Wolfson Medical Center, Holon, Israel*

Background: Systolic pulmonary artery (PA) pressure which is usually reported in echo results might not be sufficient to characterize the underlying mechanisms

Methods: 150 adult outpatients with systolic PA pressure > 40 mmHg were identified from the data-base of our echo-lab. Pulmonary capillary wedge pressure (WP) was calculated from early mitral inflow and flow propagation velocity according to validated equation. A cutoff value of 18mmHG was used to separate between groups with high and low values. PA vascular resistance (PVR) was calculated from tricuspid regurgitation velocity and time velocity integral at the RVOT. A value of 1.8 wood-units was used to separate among groups. Patients were divided into 4 groups: 1- low WP low PVR, 2 - low WP high PVR, 3- high WP low PVR, 4-high WP high PVR.

Results: Mean age was 71, 57% women, 71% hypertension, 25% post MI and 13% post CABG. Groups 1-4 included 48, 37, 22 and 43 patients respectively. PA pressure (mmHG) was similar in the 4 groups: 47, 52, 48 and 55 respectively. LV ejection fraction (%) were 51, 46, 47 and 38 respectively ($p<0.001$). left atrial area was significantly higher and mitral regurgitation was graded as more severe in groups 3 and 4. Cardiac output was related to PVR (significantly higher values in groups 1 and 3).

Conclusions: Ambulatory cardiac patients with pulmonary hypertension differ in the pathophysiology of their disease as defined by left heart function and PVR. Characterization of these pathophysiological parameters might have implications to therapy and prognosis.