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.