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Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

VALIDITY OF REAL-TIME SINGLE-BEAT VERSUS MULTI-BEAT FULL-VOLUME CAPTURE THREE-DIMENSIONAL ECHOCARDIOGRAPHY FOR QUANTIFICATION OF RIGHT VENTRICULAR VOLUME: VALIDATED BY CARDIAC MRI

Poster Contributions
Poster Hall B1
Monday, March 16, 2015, 9:45 a.m.-10:30 a.m.

Session Title: Non Invasive Imaging: Advances in Clinical Non-Invasive Imaging
Abstract Category: 17. Non Invasive Imaging: Echo
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Background: Right ventricular (RV) volume and function are shown to be directly associated with prognoses in patients with heart disease, therefore, it is critical to assess accurate RV performance. Recently, single-beat (SB) full-volume capture real-time three-dimensional echocardiography (3DE) imaging system was introduced and was shown to be useful for assessing left ventricular volume and function. Considering that a suitable non-invasive method for assessing RV volume and function is lacking, the purpose of this study is to investigate the feasibility of SB full-volume capture real-time 3DE for evaluating RV volume and function compared with those of multi-beat (MB) full-volume capture real-time 3DE imaging system validated by cardiac magnetic resonance imaging (cMRI).

Methods: Thirty-three consecutive subjects with myocardial infarction underwent 3DE and cMRI. RV volume and functional assessments of SB and MB full-volume capture 3DE using Tomtec software were compared with those of manual tracing with cMRI as the reference method.

Results: Twenty-eight of 33 patients (92%; 19 male, mean age, 62 ± 15 years) had adequate 3DE data sets for analysis. The correlations of mean RV end-diastolic volume, end-systolic volume, and ejection fraction between SB and cMRI vs. between MB and cMRI were as follows: r = 0.82 vs. 0.84, r = 0.79 vs. 0.80, r = 0.52 vs. 0.57. RV volume was similar between SB and MB, however, that of SB, but not MB, was significantly smaller than that of cMRI. RV ejection fraction was similar among SB, MB, and cMRI.

Conclusion: Majority of the patients with myocardial infarction had adequate 3DE images for RV analysis. Not only MB but also SB full-volume capture 3DE can accurately estimate RV ejection fraction, however, close attention should be paid for assessing RV volume especially with SB 3DE.