THE FEASIBILITY AND ACCURACY OF CONTRAST-ENHANCED ECHOCARDIOGRAPHIC ASSESSMENT OF LEFT VENTRICULAR GLOBAL LONGITUDINAL STRAIN

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PROBLEM
Patients with difficult imaging in echocardiography cannot have Global Longitudinal Strain (GLS) track for them. This leaves out vital information for several patients.

BACKGROUND
Left ventricular (LV) GLS derived from speckle-tracking echocardiography (STE) is used in various cardiac pathologies as an assessment of subclinical LV systolic function. Its main limitation is the inability to assess GLS in patients with poor image quality – the use of ultrasound enhancing agents (UEA) was an exclusion in using GLS. As part of a quality study, we evaluated the feasibility of assessing GLS in patients with UEA images, comparing to non-UEA images.

OBJECTIVE
Our objective was to compare Ultrasound enhanced imaging (UEI) to contrast enhanced imaging (CEI) for the analysis of GLS. We wanted to see if the calculation of the two measurements were similar, to then prove or disprove that acquiring GLS off contrast imaging was accurate.

METHODS
Echoes were included if they met the following criteria: transthoracic echocardiography images of adequate quality for GLS to be acquired, and UEA used as per clinical indication to better visualize endocardial definition. GLS was performed post echo acquisition on both non-UEA and UEA images.

RESULTS
There were 50 echoes in this study: mean age 64.18 ± 17.74 years and BMI mean of 32.68 ± 9.63 kg/m2. Most echoes had good (62%, n=31) or fair (34%, n=17) image quality. The GLS measured on regular non-UEA enhanced images had a mean of 14.25 ± 4.26 %. GLS with UEA enhanced imaging had a mean of 15.07 ± 4.36 %, and a difference of 0.81 ± 1.57 % between the two sets of data. UEA GLS was higher in 74% (n=37), same in 6% (n=3) and lower in 20% (n=10) of patients. Bland-Altman plot (Figure 1) showed agreement between UEA and non-UEA GLS measurements (p<0.0001).

CONCLUSIONS
The difference between the data sets for non-UEA GLS and the UEA enhanced GLS was within a singular percentage point. With the ability to complete STE on patients using UEA imaging improved diagnostic accuracy can be obtained. The results in this study suggest that GLS can be accurately measured from UEA imaging.

REFERENCES