**NEW SOFTWARE BASED BEAMFORMING ALGORITHM IS SUPERIOR TO HARDWARE BASED BEAMFORMER IN ENDOCARDIAL BORDER DETECTION**

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*Background*: Technically limited echocardiograms can lead to non-diagnostic images that require downstream testing, increasing healthcare costs. Software-based beamforming is a signal processing technique that acquires and temporarily stores data from each probe element before analyzing it by parallel processors. This optimizes and aligns signals received by the echo transducer to improve both the spatial and contrast resolution of the image. We compare this new software algorithm with a standard, high-end hardware-based beamforming platform to evaluate endocardial borders and need for echo contrast.

*Methods*: Eligible participants were inpatients ≥ 18 years of age referred clinically for transthoracic echocardiograms. In addition to the routine exam, a limited study, consisting of three additional views (apical-4, apical-3 and apical-2 chamber), was performed with the new software based beamforming and standard platform. An echocardiographer blinded to the two platforms evaluated the number and quality of segments visualized using a 17-segment model. Quality of segments and endocardial borders were graded (0=not visualized, 1=incompletely visualized, 2=completely visualized). Physician reviewer reported an overall quality score for each study (0=poor, 1=adequate, 2=good) and whether contrast was needed as per ASE guidelines. Paired T-Test and Chi-squared tests were used for analysis.

*Results*: A total of 84 inpatients (mean age 63 +/- 16 years) were enrolled. The mean number of segments visualized in apical-4 (6.2 vs. 5.5, p<0.001), apical-3 (6.2 vs. 5.5, p<0.001), and apical-2 (6.2 vs. 5.6 p<0.001) chamber view were higher with the new versus standard platform. Average overall score for image quality was significantly better for the new platform versus standard (1.4 versus 0.9, p=<0.001). With the new platform, 23.8% were judged as requiring contrast as compared with 45.2% for the standard platform (p<0.001).

*Conclusions*: The new software-based beamformer identified more segments with better image quality when compared to the standard platform, decreasing the need for contrast usage.