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Imaging

CONTRAST ECHOCARDIOGRAPHY TRANSIT TIME ACCURATELY ESTIMATES CARDIAC INDEX AND PULMONARY VASCULAR RESISTANCE

Poster Contributions

Poster Sessions, Expo North

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Background: Contrast echocardiography has predominately been used to evaluate left ventricular wall motion and systolic function. Studies with other imaging modalities have demonstrated a relationship between contrast transit and cardiac index (CI) and Pulmonary Vascular Resistance (PVR). We postulated that both PVR and CI can be calculated from contrast echocardiography and tested the hypothesis that the assessment of transit time during contrast echocardiography could accurately estimate both CI and PVR compared to right heart catheterization (RHC).

Methods: In this pilot study, twenty-seven patients scheduled for RHC had a 2D echo completed in the preprocedural holding area immediately prior to RHC. Three ml of DEFINITY contrast followed by a 10 ml saline flush was injected through an 18 Gauge right antecubital IV. A multi-cycle echo clip was acquired from the beginning of injection to the opacification of the LV, assessing contrast transit time. The time between opacification of the right ventricle to full opacification of the left ventricle was also measured. 2D-echo based calculations of CI along with the DEFINITY-based transit time calculations were subsequently correlated with the RHC-determined CI and PVR.

Results: The transit time from initial injection to full opacification of the left ventricle strongly inversely correlated with CI, pearson correlation $r=-0.430$, $p=0.013$. The transit time from opacification of the right ventricle to full opacification of the left ventricle strongly correlated with PVR, pearson correlation $r=0.377$, $p=0.03$.

Conclusion: We describe a novel method for the quantification of CI and estimation of PVR using contrast-bolus transit time. This data can be used as another non-invasive measure of CI and PVR.