

IMAGING AND DIAGNOSTIC TESTING

AUTOMATED 3-D QUANTIFICATION OF LEFT VENTRICULAR STROKE VOLUME BY TRANSTHORACIC REAL-TIME VOLUMETRIC COLOR FLOW DOPPLER IMAGING: COMPARISON WITH SPECTRAL DOPPLER AND **3-D VOLUMETRIC STROKE VOLUME**

ACC Poster Contributions Ernest N. Morial Convention Center, Hall F Monday, April 04, 2011, 9:30 a.m.-10:45 a.m.

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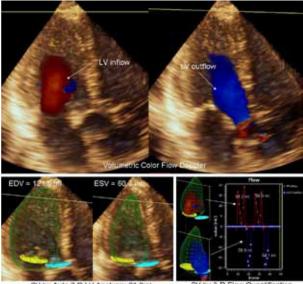
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Background: We investigated the feasibility of the real-time, every heart beat full volume color flow Doppler (V-CFD) to image, and automatically quantify left ventricular (LV) inflow and outflow.

Methods: V-CFD from 22 subjects with normal valves were enrolled (EF <= 50% in 4, 56 ± 10%, range 30~65%). Mean acquisition volume rates was 15.2 ± 3 vps. A 3-D flow quantification software was used which automatically computes the volume of LV, inflow and outflow from V-CFD. LV, mitral annulus and LV outflow tract were identified and computed automatically by integrating instantaneous color Doppler samples over the cross sectional flow area. Data from 3 ~ 5 Consecutive cardiac cycles were calculated and averaged. LV stroke volume (SV) from a fully automated LV volume analysis tool (validated with MRI by us) and from pulsed wave Doppler of LV outflow tract (LVOT-PW) were used for comparison.

Results: LVSV from LV volume had no difference compared with LVSV from LVOT-PW (70.1 ± 20.8ml, 69.7 ± 16.7ml, p>0.05) with good correlation (r=0.78, p<0.001). 3-D LV inflow and outflow volumes (73.6 ± 16.3 ml, 67.6 ± 14.6 ml) had no difference and correlated well with LVSV from LV volume and from LVOT-PW respectively (r=0.77, 0.91, p<0.001). 3-D LV inflow was 5.9 ± 5.1ml higher than 3-D LV outflow (p<0.05). This is indicative of trivial MR which may be present even in healthy subjects.

Conclusions: This is the first validation of automatic cardiac flow volume quantification using real-time, every heart beat full-volume CFD imaging.



uto 3-D LV Analysis: 61.2