



Congenital Cardiology Solutions

INTERPRETING MEASUREMENTS OF CARDIAC FUNCTION USING VENDOR-INDEPENDENT SPECKLE-TRACKING ECHOCARDIOGRAPHY IN CHILDREN: A PROSPECTIVE, BLINDED COMPARISON WITH CATHETER-DERIVED MEASUREMENTS

Poster Contributions

Poster Sessions, Expo North

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Authors: *Suma Potiny Goudar, Girish Shirali, Shahryar Chowdhury, G. Hamilton Baker, Mark Scheurer, Medical University of South Carolina, Charleston, SC, USA*

Background: Adult studies have shown that speckle-derived echo measures of cardiac function correlate with invasive measures of diastolic function, but no such studies have been done in children. Our aim was to compare speckle-derived measures of cardiac function to measurements routinely obtained by cardiac cath in children.

Methods: Echos were performed on the day of cardiac cath. Using Tomtec 2D Cardiac Performance Analysis, longitudinal strain (LS), longitudinal strain rate (LSR), diastolic LSR and ejection fraction for the right and left ventricle (RV and LV) were calculated via speckle-tracking. These were compared to cardiac output and index, dp/dt, ventricular end-diastolic pressure(EDP) and pulmonary capillary wedge pressure(PCWP) by fluid-filled catheters. A blinded observer performed all echo measurements.

Results: Fifty studies were done on 29 patients ages 4 mos to 20 yrs. Their diagnoses included cardiac transplant (48 studies), repaired AV canal (1), and dilated cardiomyopathy (1). RV EDP ranged from 2-22 mm Hg and PCWP ranged from 6-32mmHg. See table below for **Results:**

	RV EDP		RV dp/dt	
	Correlation coefficient	p-value	Correlation coefficient	p-value
RV longitudinal strain	0.379	0.01	0.412	0.005
RV diastolic strain rate	-0.136	0.379	N/A	N/A
RV ejection fraction	0.065	0.675	-0.143	0.356
	LV EDP		LV dp/dt	
	Correlation coefficient	p-value	Correlation coefficient	p-value
LV global longitudinal strain	0.588	0.04	-0.653	0.02
LV 2-chamber longitudinal strain rate	0.673	0.01	-0.574	0.04
LV global diastolic strain rate	0.297	0.349	N/A	N/A

Conclusion: Speckle-derived measures of function have stronger correlation to catheter-derived measures in the LV compared to the RV. LV global LS has the strongest correlation with invasive function measures, whereas diastolic strain did not correlate well with catheter-derived filling pressures in children. Ongoing studies are being performed using micromanometer catheters to confirm our findings.