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Diagnostic utility of rigid body rotation in children with left ventricular non-compaction: a two-dimensional speckle tracking study.

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Background: The reproducibility of accepted echocardiographic criteria of left ventricular non-compaction (LVNC) is poor. 'Rigid body rotation' (RBR) or reversed LV rotation has been suggested as a novel diagnostic parameter in adults. However, no study has examined RBR in children with LVNC. We sought to explore the prevalence of LV rotational abnormalities in children with LVNC, and the feasibility of assessing it.

Methods: We searched our echocardiographic database to identify all children who fulfilled the diagnostic criteria for LVNC between January 2010 and December 2013. All subjects underwent a normal conventional echocardiographic study. LV Short-axis views at the base and apex were obtained. LV rotation (LVrot) was assessed using two-dimensional speckle tracking echocardiography. Twenty healthy subjects served as controls.

Results: We identified 13 children with LVNC. Three patients were excluded because of poor image quality (feasibility: 10/13 patients (77%)). The study comprised 10 children with LVNC. Associated congenital heart disease was found in 7/10 patients (70%). Mean age was 6.1 years (range 1 month – 16 yrs). LV ejection fraction was reduced in 4/10 children. LVrot was abnormal in all patients (100% vs 0%, $P < 0.001$). LVrot was decreased in 2 patients, and augmented in 1 patient. A RBR pattern was noted in 7/10 patients (70%; reversed apical-rot $n = 4$, reversed basal-rot $n = 3$). The patient with augmented LVrot developed a RBR pattern during follow-up.

Conclusions: Feasibility of LVrot assessment in children with LVNC was good. A typical RBR pattern was found in most children with LVNC. However, a RBR pattern may develop during follow-up. This novel echocardiographic feature may have diagnostic implications.