**Assessment of Systolic Left Ventricular Function with Speckle-Tracking Echocardiography in Adult Patients with Repaired Aortic Coarctation**


Department of Cardiology, Erasmus MC, Rotterdam, the Netherlands (1); Department of Pediatrics, Sophia Children’s Hospital, Rotterdam, the Netherlands (2)

**Introduction:**
After successful repair of coarctation of the aorta (CoA), systemic hypertension and development of left ventricular (LV) dysfunction are of major concern at long-term follow-up. Early detection is important to avoid further deterioration. Using speckle-tracking echocardiography (STE), we evaluated LV deformation in adult patients after CoA repair and studied the relationships with conventional diagnostic parameters.

**Methods:**
In this cross-sectional study, we prospectively recruited CoA patients after repair and healthy controls. All subjects underwent echocardiography and electrocardiography. Additionally, NT-proBNP levels of the CoA patients were determined on the same day. With STE, we analyzed LV global longitudinal strain (GLS) at the apical four-, two- and three-chamber view, apical and basal rotation at the parasternal short-axis views, and assessed LV twist.

**Results:**
We included 154 subjects: 77 with repaired CoA (44% female, age 33.6±12.7 years, age at repair 2.5 [IQR:0.1-11.1] years) and 77 healthy controls (44% female, age 34.0±10.6 years). LV GLS of all three apical views and LV twist were significantly lower in patients than controls (Figure). LV GLS of the patients was correlated with systolic and diastolic blood pressure (r=0.28, P=0.021; r=0.34, P=0.005) and QRS duration (r=0.35, P=0.004). NT-proBNP levels were only correlated with LV GLS measured at the apical four-chamber view (r=0.27, P=0.023). Visually assessed systolic LV function was normal in 65 (84%) patients, mildly impaired in 11 (14%), and severely impaired in 1 (1%). When comparing only patients with normal LV function with controls, LV GLS and twist remained significantly lower in the patients (-17.3±2.3% vs. -20.2±1.6%, P<0.001; 12.7±6.6º vs. 17.2±6.1º, P=0.003, respectively).

**Conclusions:**
Adults with repaired CoA have reduced LV GLS and twist. Although the majority of patients seem to have a normal systolic LV function when assessed visually, LV GLS and twist are still reduced which could indicate early LV dysfunction.

**Figure.** Left ventricular peak systolic global longitudinal strain and twist. GLS=global longitudinal strain composed of all three apical views; GLS 4CH=GLS measured at four-chamber view; GLS 2CH=GLS measured at two-chamber view; GLS 3CH=GLS measured at three-chamber view.