

Role of speckle strain for evaluation of ventricular function after Total Cavo-Pulmonary Connection: does it identify patients at risk?

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Introduction. The evaluation of ventricular function of patients with total cavopulmonary connection (TCPC) is the object of discussion. In fact, the parameters used to evaluate systolic and diastolic function of left and right ventricle can not be applied to single ventricles with large anatomical variability. We investigated the role of speckle strain echocardiography in this setting.

Patients and methods. From January 1995 to December 2010, 68 patients had TCPC; 58 are regularly followed. Among these we evaluated 38 patients aging >10 years (median age 14 years, median distance from TCPC 7 years) with trans-thoracic M-mode, 2D, Doppler, Color-Doppler and systolic strain rate (18 segments). No patient had overt ventricular dysfunction; 2/3 of patients (group A) had a normal life including normal physical activity, normal oxygen saturation and had never needed interventional catheterization or reinterventions. The remaining patients had cyanosis, limited physical capacity and had needed repeated interventions (group B). In this group 2 patients had plastic bronchitis and 1 protein losing enteropathy.

Results. Mean fractional shortening was $29 \pm 8.6\%$, mean biplanar EF was $53 \pm 4.5\%$ and similar in both groups (53.9 ± 4.1 versus 51.6 ± 5.6). Mean ventricular mass was 112.7 ± 31.7 g/m² and significantly higher in group A patients (122.9 ± 23.8 versus 84.8 ± 36.9 , $p < 0.03$). Mean systolic strain rate was -16.1 ± 2.2 and similar in both groups (-16 ± 2 versus -16.6 ± 2.8). EF and strain rate were significantly related ($p < 0.01$).

Conclusions. Our data show that ventricular function was generally normal either in patients with excellent or poor clinical condition. In particular, systolic strain rate was normal or mildly depressed in the global population, while a higher ventricular mass might identify patients in good clinical condition. Echographic evaluation of systolic function in itself, in the absence of overt ventricular dysfunction, does not prove to be a "marker of health" in this population.