Characteristics of Doppler myocardial echocardiography in patients with tricuspid atresia after total cavopulmonary connection with preserved systolic ventricular function.

BACKGROUND: Doppler myocardial echocardiography (DME) may be an excellent additional means of assessing determinants of systolic and diastolic ventricular function in patients with tricuspid atresia (TA) after total cavopulmonary connection (TCPC).

METHODS AND RESULTS: Thirty-three patients with TA and normal systolic shortening/ejection fraction (M-mode) after TCPC were studied by DME at a median age of 7.6 years (range 1.5-17 years). These results were compared to 16 age matched normal controls. Median time under a cavopulmonary shunt was 5.2 years (range 0.6-13.3 years). Isovolumic acceleration and isovolumic velocity did not differ significantly. All other systolic (S-wave acceleration-velocity and S-wave duration) and diastolic DME indices (E-deceleration-velocity, A-velocity and E/A ratio) were significantly lower in TCPC patients in comparison to normals (p<0.0001). Furthermore, isovolumic relaxation time (IRT) was significantly prolonged in the patient group (p<0.0001). Even though there was a significant correlation between the time of volume unloading and left ventricular end-diastolic diameter, exclusion of all patients with short period of volume unloading and relatively large systemic ventricles did not alter the results. CONCLUSIONS: Patients with TA after TCPC and
normal shortening and ejection fraction have normal isovolumic acceleration. Load dependent DME indices of systolic and diastolic function, however, were significantly reduced. These findings suggest that the described DME indices mirror the "normal" hemodynamics after TCPC in patients with TA. It needs to be assessed, whether this is an index of adverse prognosis in long-term surveillance of these patients.