Ventricular diastolic function determined with a feature tracking method predicts future cardiovascular events in patients with Fontan circulation

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【 Introduction】 The prognostic value of diastolic function in Fontan patients remains unclear. 【 Methods】 We prospectively enrolled consecutive patients with Fontan circulation from 2003 to 2016, and performed per protocol cardiac MRI. To assess diastolic function, we measured circumferential and longitudinal early diastolic strain rate (DSRcc and DSRll) in the middle short axis and 4 chamber view of the ventricle(s) using a feature tracking method. We traced both left and right ventricles when present. 【 Results】 A total of 80 patients were enrolled. The median DSRcc was 0.63/s [range: 0.12-1.36] and median DSRll was 0.87/s [range: 0.12-4.25]. DSRcc and DSRll showed negative correlations with age (r 0.32, p<0.01/r 0.37, p<0.01, respectively), ventricular mass index (r 0.53, p<0.01/r 0.33, p<0.01) and showed positive correlations with biventricular end-diastolic volume index (r 0.30, p<0.01/r 0.29, p<0.01, respectively), biventricular ejection fraction (r 0.39, p<0.01/r 0.46, p<0.01). There was no association between DSRcc, DSRll and CVP, EDP. During the follow-up period (53.0±29.3 months), 24 adverse cardiovascular events occurred (2 deaths, 5 heart failure, 19 arrhythmias, and 1 thromboembolism). Univariate Cox regression analysis showed that DSRll <0.79/s predicts future cardiovascular events (hazard ratio [HR] 4.3, p<0.01) but DSRcc does not (DSRcc <0.65/s; HR 1.7, p 0.26). The clinical cut-off points were determined from the ROC curve. 【 Conclusions】 In patients with Fontan circulation, DSRll predicts future cardiovascular events.