Hazards of ventricular pre-excitation to left ventricular systolic function and ventricular wall motion in children: analysis of 25 cases

Introduction: Abnormal electrical and mechanical conduction may mediate left ventricular dysfunction and remodelling. Since 2004, there have been over 60 reported cases that have suggested a possible causality between ventricular pre-excitation and dilated cardiomyopathy in the absence of sustained tachyarrhythmia. These cases were diagnosed with ventricular pre-excitation-induced dilated cardiomyopathy. However, it is only recently that ventricular pre-excitation with right-sided accessory pathways, which may cause abnormal interventricular septal motion and even dilated cardiomyopathy in patients with Wolff–Parkinson–White syndrome, has attracted attention.

Methods: We analysed the clinical, electrophysiological, and echocardiographic characteristics of the 25 cases with abnormal ventricular wall motion, left ventricular systolic dysfunction, or dilation with co-existing right-sided overt accessory pathways before and after ablation or medication during March 2011 and June 2017. Moreover, we compared the therapy effect between patients with ventricular pre-excitation induced dilated cardiomyopathy and idiopathic dilated cardiomyopathy without ventricular pre-excitation.

Result: Abnormal ventricular wall motion was demonstrated using M-mode echocardiography in 23 cases. The basal segments of the interventricular septum became thin and moved similarly to an aneurysm with typical bulging during end-systole, which was observed in 16 cases. Dilated cardiomyopathy was diagnosed in 14 cases. A total of 23 patients underwent successful ablations and received medications, and the other two patients received only oral medications because of young age. The prognosis of pre-excitation-induced dilated cardiomyopathy is better than idiopathic dilated cardiomyopathy. All the cases with abnormal ventricular wall motion demonstrated recovery of normal left ventricular ejection fraction and decreased left ventricular end-diastolic diameter through ablation.

Conclusion: Ventricular pre-excitation caused by right-sided accessory pathways may result in abnormal ventricular wall motion, left ventricular systolic dysfunction, dilation, and even dilated cardiomyopathy. In some cases with dilated cardiomyopathy, ventricular preexcitation may not be the cause of disease but a harmful factor which hampered the recovering of left ventricular systolic function. These conditions are indications for ablation with good prognosis.