Successful right anteroseptal manifest accessory pathway cryoablation in a six month infant with dyssynchrony-induced dilated cardiomyopathy

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Wolff-Parkinson-White (WPW) syndrome with right-sided septal or paraseptal accessory pathways (APs) may cause eccentric septal activation, resulting in dyssynchrony and left ventricular dysfunction. Catheter ablation of the AP is an effective treatment option, although with high complication rates in infants. We present a case of six month age infant, who was diagnosed with WPW syndrome with right-sided anteroseptal (parahisian) AP and dilated cardiomyopathy. She was referred to our hospital with heart failure symptoms, weighing 8 kg, and having grade 1-2/6 heart murmur, mild tachypnea and hepatomegaly on physical examination. There were typical ventricular preexcitation signs like short P-R interval and wide QRS complexes with delta waves on 12-lead surface ECG, suggestive with an anteroseptal manifest AP (Figure 1A). Echocardiography showed rightward systolic bulging of the basilar septum and a dilated left ventricle with impaired systolic functions ([LVEDD:40 mm (Z-score: + 4.4) and ejection fraction (LVEF) 34% by Simpson’s method. Measurements for interventricular mechanical delay (IVMD) and septal-to-posterior wall motion delay (SPWMD) were 74 ms and 290 ms respectively, consistent with dyssynchrony (Figure 1A). Because of symptomatic dyssynchrony-induced dilated cardiomyopathy, electrophysiologic study (EPS) was performed. The patient was intubated and the EPS was performed under general anesthesia. Right and left fornaral veins were catheterized and also an esophageal catheter was inserted. 3-D mapping and fluroscopy were used together during delta mapping, and the earliest site of ventricular preexcitation was found in right anteroseptal/parahisian region, with -38 miliseconds. A 6mm cryocatheter was used for ablation, and just at the 4th second of the first cryomapping, the AP had disappeared (figure1C). Four complete lesions of cryo at -80°C were given on this location. There was no complication during the procedure, but incomplete right bundle branch block. On the 9. month of follow-up, left ventricular functions and dyssyncrony measurements were found totally improved (LV ejection fraction 69%, IVMD=19 ms and SPWMD=5 ms, Figure 1B).

This case is one of the youngest reported infants with successful catheter ablation due to dyssynchrony-related cardiomyopathy. This case also showed that cryoablation can be safely performed in anteroseptal manifest AP even in infants.

Figure 1. A: Decreased LV systolic function with an EF of 34.6% (Simpson’s). M-Mode ECHO showing marked dyssynchrony caused by the ventricular preexcitation of the anteroseptal AP. 12 lead surface ECG on admission, showing WPW preexcitation. B: M-mode echocardiography showing improved left ventricular systolic function, with an EF of 69%. 12 lead surface ECG, showing no ventricular preexcitation sign and incomplete RBBB after successful ablation of the AP. C: 3D anatomy of the right atrium and ventricule, with blue dots showing targets on the anteroseptal region, and diagnostic catheters in high right atrium (HRA), esophagus (SZFGS) and right ventricle (RVA), and the 6mm cryocatheter active, in the middle. Intracardiac and surface 12 lead electrograms during the successful cryoablation.