

Left coronary cusp cryoablation of the accelerated idioventricular rhythm in a child, triggering torsades de pointes and resulting in cardiac arrest

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Accelerated idioventricular rhythm (AIVR) is known as a benign arrhythmia and normally requires no specific treatment. But very rarely, it can also give rise to more severe arrhythmias. Here, we present a child with left coronary cusp-originating AIVR, degenerating in to Torsades de pointes (TDP) and resulting in cardiac arrest, which was ablated with a cryocatheter. To our knowledge this is the first pediatric case in the literature.

An 11 years-old boy, who has been followed due to asymptomatic AIVR in another center before, was referred to our department, because he had experienced an aborted cardiac arrest during sleep. He had been resuscitated for 5 minutes. 12 lead surface ECG showed frequent AIVR, with a left bundle branch block morphology, QRS axis in inferior leads and a QRS transition zone on precordial V3(Figure1-A). A 12 lead 24 hour Holter-ECG revealed incessant AIVR, consisting up to 90 % of the whole record and two TDP attacks, triggered by AIVR-induced ‘R on T’ phenomenon, and resulting in syncope and cardiac arrest (figure 1-B). The exercise treadmill test was normal. Transthoracic echocardiography revealed no structural cardiac defect but mild left ventricular systolic dysfunction with an EF of 45% and SF 23%. An electrophysiologic study (EPS) was conducted under general anesthesia. AIVR focus was mapped to left aortic coronary cusp (figure 1-C), and selective left coronary angiography revealed close neighborhood to coronary ostium , so a cryocatheter with an 8 mm tip was preferred for successful ablation of the AIVR focus (Figure1-D). The patient was discharged in three days without any PVCs or AIVR and with normal cardiac functions (EF 66% and SF 35%). After 9 months on follow-up, he is still asymptomatic, without any PVCs/AIVR,normal ECG (QTc:412 ms), and normal cardiac functions.

Although the clinical course of AIVR is known as benign, this case report shows that it may also degenerate to a life-threatening arrhythmia. EPS and catheter ablation is a good option in such cases for an ultimate cure. This case also showed that; cryoablation is a good and safe alternative to RF ablation in procedures close to the coronary arteries.



Figure 1: A- Twelve lead ECG with frequent AIVR, B-'R on T' phenomenon triggering Torsades on Holter-ECG C- 3-D Map showing the focus in the left coronary cusp, near the orifice of LMCA, ablated with Cryocatheter. D- Intracardiac ECG showing successful cryoablation of the frequent AIVR