Pre-procedural AV Nodal Conduction Disorders in Atrial Septal Defect Secundum Patient, What should we Keep in Mind? A Case Report

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Introduction: Atrial tachyarrhythmias are commonly seen in patients with ASDs, regardless of the type. AV block may be caused by injury to the conduction system during surgical ASD closure. Pre-procedural AV nodal conduction disorders are rare with other ASD types.

Methods: A 50-year-old woman presented to Cardiology Outpatient Clinic with dyspnea on effort and easily fatigue when doing heavy activities since last year. Physical exam was significant for right ventricular heaving and fixed-split second heart sound, and tricuspid regurgitation murmur. Transthoracic echocardiography revealed a secundum ASD with dilatation of both atrium and right ventricle. Subsequent transesophageal echocardiography revealed echo gap in the interatrial septum with diameter 17–27 mm. Right heart catheterization revealed a high flow low resistance of secundum ASD with mild pulmonary hypertension (mPAP 29 mmHg). Then patient underwent percutaneous ASD closure. Unfortunately, the procedure was aborted because of unsuitable device’s size and there were documented junctional rhythm with VPC frequent. The holter monitoring showed first degree AV block and 41% burden of multifocal VPC. CT cardiac revealed normal coronary arteries. From surgical conference, patient was planned to undergo surgical ASD closure with back up of temporary pacemaker.

Result: Chronic left to right shunt associated with ASD increased hemodynamic load and geometric remodeling either cellular or macroscopic level. It caused electrical remodeling that could precipitate the development of tachyarrhythmias and conduction disorders. Different types of ASDs may also have a specific impact on the sinus node and or AV node depending on embryologic origin and anatomic proximity. Pre-procedural AV nodal conduction disorders are rare with other ASD types. It can be related to mutations in a family of closely-associated myocardial transcription factors such as NKX2.5, GATA4 and TBX5j gene whom commonly associated with secundum ASDs. The identification of specific gene mutation is practically important to predict the risk of progressive AV block and the requirement for pacemaker implantation during and after device closure. In this patient, genetical mapping has not been done yet because of lack of facilities. So, the patient still planned to go surgical ASD closure with back up of temporary pacemaker. The needed for permanent pacemaker implantation and electrophysiology study-ablation was determined from closed monitoring during ambulatory care.

Conclusion: AV nodal conduction disorder in secundum ASD is rare and can be related with specific gene mutation. If there was a limitation in genetical mapping facilities, closed monitoring during ambulatory care can be alternative to evaluate the needed for either permanent pacemaker implantation or electrophysiology study-ablation.