Pre-existing SND-AVND with High Burden Multifocal VPC in Secundum Atrial Septal Defect: PPM or ICD implantation after Surgical Closure?

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Introduction : Pre-existing conduction disorders with ventricular arrhythmias (VA) are most frequently seen in a patient with ostium primum ASD, but rare in other ASD types. Because of sudden death's risk in this population, early intervention with pacemaker implantation and or implantable cardioverter-defibrillator placement should be considered.

Methods : A 50-year-old woman with secundum ASD was admitted for percutaneous ASD. Two months before admission, she was noted to have junctional rhythm albeit she did not complain of any specific cardiac symptom. Percutaneous closure was aborted because of unsuitable device’s size and documented multifocal VPC frequent. Intermittent AV Block 2:1 and 41% burden of multifocal VPC were diagnosed in Holter monitoring after percutaneous procedure. On 6th August 2019, she underwent surgical closure with the placement of a temporary epicardial pacemaker. There was no residual shunt and complication during the surgery. Post-surgery ECG evaluation showed VPC bigeminy without junctional or AV Block. A week after surgery, the patient had PPM implantation.

Result : Primarily right-sided volume overload in atrial septal defect (ASD) leads to electrical remodeling that might predispose patients to atrial tachyarrhythmia and conduction disorders. Conduction disorders and ventricular arrhythmia were rare in secundum ASD. In this patient, it can be one clinical entity caused by NKX2.5 gene mutation or even two different clinical entities. Actually, identification gene mutation is practically important to predict the risk of progressive AV block and the requirement for pacemaker or ICD implantation during or after closure. In this patient, genetically mapping has not been done yet because of lack of facilities. The profound consideration of PPM implantation, in this case, is due to documented SND on ECG surface. SND can be related to electrical and structural remodeling, but it remains irreversible although ASD, as an underlying structural problem, has corrected. Regarding VA, closed hemodynamic monitoring are conducted, hoping that improvement of right-sided over volume after ASD closure can reduce VPC burden. If the VPC burden was still high, EP study and ablation will be initiated. On the other hand, PPM replacement with ICD will be considered if there were documented sustained VA or cardiac arrest survivor.

Conclusion : Pre-existing conduction disorders with ventricular arrhythmias (VA) are rare in the secundum ASD. Given the risk of sudden cardiac death in this population, PPM or ICD implantation should be considered.