Recurrent Ventricular Arrhythmia from Left Ventricular Summit After Ablation, What Should We Do Next For Ablation Strategy?

Introduction: The left ventricular summit (LVS) is a complex anatomical region located at the epicardial base of left ventricular outflow tract (LVOT) and approximately 14.5% origin of idiopathic ventricular arrhythmias (VAs). There is a percentage of patients in whom successful ablation cannot be achieved because of anatomic limitations. In this regard, one of the most challenging clinical problems in electrophysiology (EP) is the approach to VAs arising from the LVS.

Methods: A 17-year-old woman with recurrent palpitation for 2 years before admission. She has undergone ablation 2 years ago and the result was successful ablation of idiopathic VT from great cardiac vein (GCV). For the present EP study findings were earliest activation time (AT) of 45 ms in anterior interventricular vein (AIV) and AT of 15 ms in right ventricular outflow tract (RVOT). Radiofrequency (RF) ablation in 3 locations were done in AIV, LCC, and RVOT with thermocool-irrigating and the power of 20-30 watt. After procedure, VAs did not occur, however one day after procedure, the VAs recurred.

Result: The comprehensive approaches for mapping LVS should be done, including mapping the GCV / AIV, coronary cusps, LV endocardium below LCC, and RVOT. Catheter ablation should be performed at the site where earliest activation is recorded and, where the pace map is optimal. When the GCV/AIV is selected as ablation site but ablation not feasible due to proximity to coronary arteries, the next step is to maneuver ablation catheter to an adjacent site that is next earliest. In this case, the next strategy is the RF energy mode starting at 20 W and titrating up to 40 W with the goal to achieve a decrease in impedance of at least 10% from baseline. Long RF (≥3 minutes) and high slowly up- titrated power (40W) are sometimes necessary to achieve deep transmural lesions. If this strategy fail, epicardial approach eventually could be attempted.

Conclusion: Ventricular arrhythmias from LVS are a challenging case in electrophysiology. Although there is anatomical limitation, arrhythmic focus can be typically reached by ablation from the coronary venous system or from adjacent structures, with appropriate RF ablation strategy.