Usefulness of a variable circular decapolar catheter placed in the coronary sinus ostium in patients with atrioventricular reentrant tachycardia and persistent left superior vena cava

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Introduction: Persistent left superior vena cava (PLSVC) is the most common anomaly of the thoracic venous system. Some reports show that PLSVC is associated with the development of AV node reentrant tachycardia. There is some difficulty to decide the appropriate site for slow pathway ablation especially a patient with coronary sinus ostium enlargement.

Methods: A 54-year-old woman suffered from palpitations due to paroxysmal supraventricular tachycardia (PSVT) for twenty years. The preoperative echocardiogram and computed tomography revealed she had PLSVC. She underwent an electrophysiology study and ablation for PSVT using a variable circular decapolar catheter placed in the coronary sinus (CS) ostium under 3D mapping system guidance. And three catheters were positioned in the high right atrial (HRA), His bundle, right ventricular apex (RVA), and CS.

Result: The patient was induced into an PSVT when a premature atrial beat at 440 ms was delivered after eight consecutive paced beats at a drive cycle length of 600 ms. Phenomenon "jump" in the AH interval was noted prior to initiation of tachycardia. The atrial activation pattern was concentric with earliest atrial activation seen on the His catheter. Successful atrial entrainment during RVA pacing produced a V-A-V response. Para-Hisian pacing indicated retrograde conduction over the fast atrioventricular (AV) nodal pathway. These findings provided a diagnosis of atrioventricular reentrant tachycardia (AVNRT). During electrophysiology study, a circular decapolar catheter (7-8) recorded the small potential that suggests slow pathway potential. Slow pathway ablation was performed under 3D mapping system with circular decapolar catheter, after the ablation the patient could no longer be induced into any tachycardia despite multiple attempts at reinduction with and without isoproterenol.

Conclusion: A variable circular decapolar catheter placed in the CS ostium may be useful in a catheter ablation for AVNRT complicated by PLSVC.