Orthodromic Reentrant Tachycardia with Electrical Disconnection between Coronary Sinus and Left Atrium

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Introduction: Electrophysiology (EP) study and radiofrequency (RF) ablation of supraventricular tachycardia (SVT) is simple and successful in most of the time. Here we share our case with unusual coronary sinus activation during SVT.

Methods: We did EP study on 26 years old female with documented supraventricular tachycardia (SVT) who had no procedure before. Retrograde study was eccentric with earliest atrial signal (A) at distal coronary sinus (CS) position. Tachycardia was induced with one extra right ventricle (RV) pacing and same CS activation as RV pacing. (Figure 1) Pacing maneuvers were all consistent with Orthodromic Reentrant Tachycardia (ORT). Mapping was tried through retrograde aortic approach and mapped in tachycardia for earliest A signal and tried ablations for five times each lasted for about 15 seconds. During ablation we noticed CS electrical activation gradually changed from distal CS to proximal CS position though tachycardia cycle length remained not changed. Since CS activation changed, first thought as another tachycardia substrate and repeated diagnostic maneuvers again. His refractory premature ventricular complex (PVC) from both RV and left ventricle advanced next A consistent with atrioventricular reentrant tachycardia (AVRT). Since activation was earliest at proximal CS position, mapped around septal side of mitral valve ring and also on tricuspid valve ring for earliest A. During this we also noticed intermittent changing of CS activation back to distal CS position. Also on RV pacing, CS activation was eccentric.

Result: Combined with this features, we mapped around initial ablation site again in tachycardia and found very closed VA around initial ablation site with discordant CS electrical activation which was delayed at that position and successfully ablated around that site (Figure 2).

Conclusion: Although we can rely on CS activation sequence in SVT with eccentric VA conduction most of the time, it could sometime lead us in wrong way even.