Atrial Tachycardia Originated from Non-Coronal Sinus of Valsalva

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Introduction: In a structurally normal heart, atrial tachycardia frequently found originate from crista terminalis, tricuspid annulus, coronary sinus ostium, pulmonary veins, or mitral annulus. Non-coronary sinus of Valsalva, which is adjacent to an interatrial septum, sometimes detected to be an origin of atrial tachycardia.

Methods: We report a patient underwent non-coronal sinus of Valsalva atrial tachycardia ablation as well as a review of related literature.

Result: A 58-year-old woman sent to our EP lab with intermittent palpitation for 3 months. Physical examination was unremarkable. Twelve-lead ECG showed regular, narrow complex, tachycardia at a rate of 160 bpm. with isoelectric P-wave in lead I and aVL, negative wave in the II, III, and aVF, with an R-P interval of 220 milliseconds (ms.). Echocardiogram revealed a structurally normal heart with good LV systolic function. An electrophysiology study performed using the right ventricular (RV) catheter, coronary sinus (CS) catheter and ablation catheter positioned at the His location. The tachycardia was induced by atrial extra stimuli (S1 500ms, S2 320ms). Intracardiac electrogram (EGM) showed a regular narrow complex tachycardia, variable cycle length 312 – 410 ms., A-A preceded and predicted V-V interval, with concentric atrial activation. Right and left atrial electroanatomic mapping (Rhythmia™ mapping system; Boston Scientific, Natick, MA, USA) showed the earliest activation at the interatrial septal area with local EGM signal earlier than the onset of the P wave on surface ECG of 23 ms. and 30 ms. respectively. Multiple RF ablation attempts at this site failed to terminate the tachycardia. At this point, we decided to map the non-coronal sinus of Valsalva and found the earliest local EGM signal of 50 ms. earlier than the P wave onset. RF ablation at this site terminated the tachycardia within 5 seconds and rendered it non-inducible. Prevalence of atrial tachycardia originating from non-coronal sinus of Valsalva in all patients with focal atrial tachycardia was 4.1-8.8% upon the literature, but these numbers might be overestimated in specialized centers, due to referral bias. The decision to evaluate the non-coronal sinus of Valsalva was made after extensive left atrium and right atrium mapping revealed focal atrial tachycardia with earliest atrial activation near the His. Ablation in the non-coronal sinus of Valsalva at the site of earliest activation, if the tachycardia terminates within 10 sec., the procedure is successful. The procedure seems a safe procedure as 1% of complication rate (risk for cerebral embolism) with 99% long-term ablation success.

Conclusion: Dealing with atrial tachycardia with the earliest activation on an interatrial septum, the non-coronal sinus of Valsalva should be considered as one of the possibilities of an origin.