Earlier PVC Transition Zone in V2 and V3 Predicts Higher Successful Rate of Left Ventricular Summit Ventricular Arrhythmias Radiofrequency Catheter Ablation

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Introduction: Radiofrequency ablation of ventricular arrhythmias (VAs) originating from left ventricular (LV) summit is a challenge. This region is the highest portion of the LV epicardium, near the bifurcation of the left main coronary artery (LMCA), and accounts for up to 14.5% of LV VAs. LV summit VAs have various anatomical limitations, making it difficult and often needing multiple approaches for mapping and ablation. We report the outcomes of radiofrequency ablation of LV summit VAs and the clinical and ECG features associated with successful ablation.

Methods: We recruited all LV summit VAs cases that underwent coronary venous system and/or endocardial radiofrequency catheter ablation between January 2015 and July 2019 in National Cardiovascular Center of Harapan Kita, a total of 26 patients (male 57.7%; mean age 51 +/- 14 years).

Result: LV summit VAs ablation success rate was 69%. Patients more frequently in preserved LV and RV function, with hypertension as a traditional risk factor. Only 11.5% patients with history of ablation and 57.7% patient with 3D-mapping ablation. Majority of patients with LV summit VAs, show LBBB type morphology with inferior axis and negative in aVL lead. About 80.8% patient have earlier VAs precordial lead transition with higher R/S ratio in V2 and V3, than their basic rhythm. All patients have Maximum Deflection Index (MDI) >0.55, suggesting epicardial origin. Earliest ventricular activation in successful ablation was earlier than in failed ablation (44.1 +/- 15.3 vs 31.4 +/- 16.4 msec). Earlier transition zone of VAs was significantly higher in the successful group. R/S ratio in V2 and V3 were higher and Betensky score was higher in the successful group.

Conclusion: The LV summit VAs radiofrequency catheter ablation is challenging, with lower success rate rather than ablation of others idiopathic VAs. Patient with successful ablation of LV summit VAs have earlier ventricular activation and earlier VAs precordial lead transition with higher R/S ratio in V2-3 and higher Betensky score.