Abstract: P432

Mitral isthmus ablation guided by high-resolution mapping: identification and localization of residual endocardial and epicardial conduction across the mitral isthmus

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Background: Mitral isthmus (MI) ablation for atrial tachyarrhythmias remains challenging.

Purpose: The purpose of this study is to evaluate the use of a high-resolution mapping system to identify and localize residual endocardial and epicardial conduction after MI linear ablation.

Method: Forty consecutive patients undergoing MI ablation were enrolled in this study. After initial endocardial linear ablation in the MI (from the lateral mitral annulus to the left inferior pulmonary vein), high-resolution activation mapping of the MI region was performed to verify conduction block or to identify residual conduction across the MI during left atrial appendage (LAA) and/or coronary sinus (CS) pacing. If a residual gap was identified in the LA endocardial lesion, additional RF was delivered there. If activation time in the CS adjacent to the level of the endocardial lesion was earlier than any site on the endocardial MI line, epicardial ablation from inside the CS was performed. Remapping for verification of conduction block and additional RF applications if needed was repeated until bi-directional conduction block across the MI was achieved.

Results: The first endocardial linear ablation resulted in complete conduction block across the MI in 9/40 patients (23 %). A total of 52 residual connections were identified in the remaining 31 patients and were classified into 4 groups: 1) endocardial gap on the MI line (N = 17; 33 %), 2) epicardial connection via CS (N = 17; 33 %), 3) residual endocardial conduction along the LAA ridge (N = 14; 27 %), and 4) residual epicardial conduction along the LAA ridge (N = 4; 7 %). Residual endocardial or epicardial conduction was identified on the LAA ridge in 7 patients by high-resolution activation mapping, even though a conventional validation maneuver (differential pacing based on CS activation timing) suggested bi-directional block. In 2 of those patients, peri-mitral macroreentry with conduction via the LAA ridge was induced by atrial pacing. Complete conduction block was achieved in 39/40 (97.5 %) patients.

Conclusions: High-resolution activation mapping accurately identifies and localizes residual endocardial and epicardial conduction across the MI, facilitating creation of complete conduction block across this region.