Identification of Post-pulmonary Vein Isolation Conduction Gaps Using HD Grid Catheters With Different Pacing Sites and Cycle Length

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Introduction: In patients with drug-refractory symptomatic atrial fibrillation (AF), pulmonary vein isolation (PVI) is a cornerstone therapy. However, reconnections of left atrial-pulmonary vein conduction remain the main cause of AF recurrences. We aimed to evaluate the utility of HD Grid catheters for identification of conduction gaps after PVI using different pacing cycle lengths from different pacing sites.

Methods: This study retrospectively enrolled 10 patients (56.7±10.9 years old) with drug-refractory symptomatic AF who underwent electro-anatomical guided PVI. Identification of post-PVI conduction gaps was displayed by HD Grid catheters during sinus rhythm (SR), distal and proximal coronary sinus (CS) pacing at 600ms and 400ms cycle lengths, respectively.

Result: Patient characteristics and ablation details were summarized in Table 1. After PVI, the regional distribution of conduction gaps were shown, which mostly occurred on bilateral carina areas (Figure 1) during either distal or proximal CS pacing at 600ms and 400ms cycle lengths, respectively, but not in SR. Figure 2 shows an example of the identification of right pulmonary vein carina conduction gaps when pacing at 400ms cycle length, whereas no conduction gaps were found when pacing at 600ms cycle length.

Conclusion: High density mapping using HD Grid catheters can identify specific conduction gaps between left atrium and pulmonary veins. When pacing at different sites and cycle lengths, anisotropic conduction gaps could be revealed. It has a notable value in planning ablation approach to eliminate conduction gaps after PVI.