The use of a high-density grid-style mapping catheter in catheter ablation of ventricular arrhythmias

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Introduction: High-density mapping catheters may provide benefit across a spectrum of cases, from simple paroxysmal atrial fibrillation to complex ventricular tachycardia (VT). Fast and accurate point collection to create reliable electroanatomic maps is especially critical during VT procedures. Utilization of a high-density, grid-style mapping catheter in combination with automated mapping software and the HD Wave configuration has been reported to reliably collect a high density of points and confirm effective isolation rapidly. Here, procedural characteristics were examined in VT cases using a high-density, grid-style mapping catheter in a Japanese population.

Methods: Procedural data was collected for VT cases utilizing a high-density, grid-style mapping catheter from 12 participating centers in Japan. Procedural data including electrode configuration, mapping time, AutoMap setting, points acquired, ablation targets, and acute outcomes were recorded.

Result: Procedural data from 16 VT (11 premature ventricular contraction (PVC), 3 idiopathic, and 2 ischemic) cases were collected from September to December 2018 in Japan. De novo ablation accounted for the majority of the cases (12 de novo, 4 redo). Documented ablation locations in descending order were RVOT (4 PVC, 2 idiopathic), LV (3 PVC, 2 ischemic), LVOT (4 PVC), and RV (1 idiopathic). Retrograde access was used in 9 cases (6 PVC, 1 idiopathic, 2 ischemic) and only 1 transeptal access was reported. The AutoMap module was utilized in 14 cases (11 PVC, 1 idiopathic, and 2 ischemic). Maps were created in sinus rhythm for all but one case (idiopathic). While a voltage map was used to define ablation strategy in the two ischemic VT cases; all PVC and idiopathic VT cases used the LAT map. The HD Wave electrode configuration, which accounts for directionality by collecting data exclusively from orthogonal bipoles, was used in all but one ischemic VT case. Overall, an average of 7630.9 points were collected in 23.1 minutes (330.3 points/minute) from the 15 VT cases utilizing the HD wave configuration during mapping. Acute procedure success was reported in 13 cases (4 no inducible VT, 2 elimination of clinical VT, and 7 no recurrent PVC).

Conclusion: While the ablation location, mapping and procedural time vary from case to case for VT ablation, the application of this high density, grid-style mapping catheter is highly versatile. In PVC,
idiopathic and ischemic VT ablation, the primary locations for ablation were RVOT and LV with over 81% acute procedural success when the high density, grid-style mapping catheter was used.