Utility of novel Omnipolar activation maps for the detection of ventricular premature contraction origin

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Introduction: Bipolar electrograms are significantly influenced by direction of the propagating wavefront in relation to the recording bipole. Omnipolar voltage mapping (Advisor™ HD Grid, EnSite Precision™, Abbott Medical, USA) may be superior to standard bipolar mapping since it obtains maximum voltage of all possible bipolar electrode orientations without the need for catheter rotation. Whether omnipolar activation maps also describe better activation maps versus traditional bipolar maps during ventricular premature contraction (VPC) catheter ablation is unclear.

Methods: N/A

Result: A 71 year-old male with symptomatic drug-refractory VPCs was admitted for catheter ablation. An Advisor™ HD Grid “Super” high-density mapping catheter was advanced to the right ventricular outflow tract. 3D electroanatomical mapping was performed with the Advisor™ HD Grid catheter (4mm inter electrode spacing along and across the catheter splines) and a high-resolution activation map was created. Bipoles were calculated along (MAP 2), across (MAP 3) and bidirectional (MAP 4) the splines while omnipoles (MAP 1) were derived from a right triangle clique. Within a square area, four omnipolar and two bipolar values along, across and bidirectional values were defined. Though the earliest activation site was vague by along and across maps (arrow), white color became evident by bidirectional map, and the VPC origin became distinct with omnipolar mapping. RF lesions were given via an open-irrigated ablation catheter (TactiCath™ Quartz Ablation Catheter, Abbott Medical, USA) targeting a lesion size index 5.0. The VPC was eliminated by first radiofrequency ablation.

Conclusion: Omnipolar activation mapping may be more accurate than traditional bipolar mapping during ventricular premature contraction (VPC) catheter ablation.