Reply to: Two Ripples in a Pond: The Subtleties of Mapping Observations in Localizing PVC sites

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Abbreviation

PVC premature ventricular contraction

We wish to thank Dr. Anderson and colleagues for their thoughtful comments about our findings and congratulate them for their own contribution towards improved interpretation of complex intracardiac electrograms in the outflow tract and left ventricular summit regions[1].

As our study[2] was a retrospective review of electroanatomic maps collected in clinical practice, intraprocedural approaches to selecting ablation targets were not standardized across operators. Our recommended approach to mapping outflow tract PVCs suspected to be of epicardial left ventricular summit or deep midmyocardial origin involves mapping all 3 surrounding surfaces (right ventricular endocardium, left ventricular endocardium, and coronary sinus). We routinely incorporate both standard activation mapping and Ripple visualization, as well as manual annotation of the earliest bi-polar deflection regardless of whether it represents far-field or consists of a multi-component signal, into the decision regarding the initial site of ablation. We do not routinely perform empiric ablation at an alternative site if PVC suppression is achieved. However, in cases in which the putative site of origin is not reachable with a standard ablation catheter (e.g., when the earliest signal is mapped to a narrow coronary sinus branch), we perform ablation at the endocardial site(s) anatomically closest to that site.

We agree with the assessment of Dr. Anderson and colleagues that deep intramural foci may certainly be manifest as broad or multiple endocardial breakout sites using Ripple visualization. We used strict criteria, using frame-by-frame analysis, to define the earliest Ripple signal: the earliest point at which 3 grouped simultaneous Ripple bars appeared in late diastole. We believe that this definition minimizes the contribution of noise to interpretation of the earliest Ripple signal and increases the likelihood that any discrepant signal observed is clinically relevant. For the purposes of this study, only the earliest Ripple signal and earliest activation point were annotated, therefore we are unable to report whether multiple Ripple breakout sites preceded the earliest activation point in the cases included in this study.

We look forward to future discussions regarding optimizing electroanatomic mapping techniques in challenging anatomic locations and again wish to thank Dr. Anderson and colleagues for their contributions.

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