Successful modulation of atrial fibrillation drivers anchoring to fibrotic tissue after Box isolation using real-time phase mapping system: ExTRa Mapping

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Abstract

We here report a case of 41-year-old man with persistent atrial fibrillation (AF) who underwent radiofrequency catheter ablation (RFCA) using online real-time phase mapping system (ExTRa Mapping™, Nihon Kohden Co., Tokyo, Japan). This phase mapping system is characterized by the automatic creation of each phase map movie based on the 5-second wave dynamics during AF. To identify the location of AF drivers, non-passively activated areas (NPAs), where rotational activations were frequently observed, could be automatically detected. In this case, the NPAs were found at the septum near the mitral annulus (MA) and the posterior bottom of left atrium. Box isolation and subsequent RF applications on the NPA near MA could not terminate AF. AF could be converted to common atrial flutter immediately after RF applications on the NPA at the posterior bottom. After cavo-tricuspid isthmus ablation was performed, any other atrial tachycardia could not be induced. Of interest, the NPA at the posterior bottom were located on the fibrotic tissue area assessed by the late-gadolinium enhancement magnetic resonance imaging, while the NPA near the MA were located on the healthy tissue area. This indicated the possibility of the critical AF rotor meandering through the fibrotic tissue. We would like to discuss the relationship between AF rotor and atrial fibrosis through the current case.