Successful Bipolar Radiofrequency Catheter Ablation of Premature Ventricular Contractions Originating From the Left Ventricular Posterior Papillary Muscle

Takumi Yamada, MD, PhD

An 81-year-old man with frequent premature ventricular contractions (PVC) originating from the left ventricular posterior papillary muscle (PPM) underwent radiofrequency catheter ablation (RFCA). Extensive irrigated unipolar RFCA was delivered with radiofrequency (RF) power titrated up to 50 W around the earliest ventricular activation site through a retrograde transaortic approach and transseptal approach, but it never interrupted the PVC, suggesting that the PVC origin was likely to be located deep inside the PPM. An irrigated bipolar RF application was then delivered with RF power of 30 W between the transaortic ablation catheter positioned on the septal side of the PPM and transseptal ablation catheter on the lateral side (distance between the tips of the ablation catheters, 19 mm), but it failed to interrupt the PVC (Figure). Following this, the transseptal ablation catheter was repositioned to the middle between the septal and lateral ablation sites, with the transaortic ablation catheter remaining at the same site on the septal side of the PPM (distance between the tips of the ablation catheters, 13 mm) (Figure, Figure S1, and Figure S2). An irrigated bipolar RF application delivered between those catheters eliminated the PVC (Figure S1). No complications occurred.

Post-procedural late gadolinium-enhanced cardiac magnetic resonance imaging showed a very thick PPM with a superficial scar around the PPM, deeper scar on the septal and lateral sides, and the deepest scar in the middle of the PPM (Figure). Bipolar RFCA could be considered an option to treat papillary muscle ventricular arrhythmias when unipolar RFCA is unsuccessful likely because of a deep location of the ventricular arrhythmia origin.

Disclosure
There was no financial support for this study.

Supplementary Files

Supplementary File 1
Figure S1. Intracardiac tracing showing (Left panel) a successful ablation site and (Right panel) successful catheter ablation.
Figure S2. (Left panel) Activation map and (Right panel) intracardiac echocardiography (ICE) showing the successful ablation site.

Please find supplementary file(s):

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Division of Cardiovascular Disease, University of Alabama at Birmingham, Birmingham, AL, USA
Mailing address: Takumi Yamada, MD, PhD, Division of Cardiovascular Disease, University of Alabama at Birmingham, FOT 930A, 510 20th Street South, Birmingham, AL 35294-0019, USA.
E-mail: takumi-y@fb4.so-net.ne.jp
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Figure. Fluoroscopic images showing (Left panels) unsuccessful and (Middle panels) successful bipolar ablation sites. (Right panel) Late gadolinium-enhanced cardiac magnetic resonance imaging showing the radiofrequency lesions on the posterior papillary muscle (PPM) in the left ventricle (LV). Yellow, blue, and red arrows, deeper scar on the septal and lateral sides, and the deepest scar in the middle of the PPM, respectively. ABL, transseptal ablation catheter; Abl, transaortic ablation catheter; APM, anterior papillary muscle; CS, coronary sinus; ICE, intracardiac echocardiography; LAO, left anterior oblique; RAO, right anterior oblique; RF, radiofrequency; RV, right ventricle.