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Case Report

Usefulness of a wearable cardioverter defibrillator combined with catheter ablation for ventricular tachyarrhythmia storms after a myocardial infarction: A case report

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ABSTRACT

We report a case of a 60-year-old man with recurrent poly- and monomorphic ventricular tachycardia related to a recent myocardial infarction. Due to drug-refractory ventricular tachycardia despite complete revascularization, he underwent catheter ablation. Afterwards, he was fitted with a wearable cardioverter defibrillator. Three months later, no ventricular tachycardia had been recorded and an electrophysiologic study failed to induce an episode. Thus, wearable cardioverter defibrillators are useful bridging devices pending a final decision to implant a cardioverter defibrillator.

1. Introduction

Implantable cardioverter defibrillators (ICDs) are an established means of preventing sudden cardiac death from ventricular tachyarrhythmias [1]. However, current guidelines recommend deferring implantation of ICDs for 40 days or three months post-myocardial infarction (MI), depending on whether acute revascularization is achieved [1,2]. Recently, wearable cardioverter defibrillators (WCDs) have emerged as a reasonable choice for patients in whom recovery of the left ventricular ejection fraction (LVEF) is expected during the post-MI chronic phase [3].

In this report, we describe a patient with recurrent ventricular tachycardia (VT) related to a recent MI, who was successfully managed with radiofrequency catheter ablation (RFCA) targeting the triggering ventricular premature contractions (VPCs) and the surrounding substrate in conjunction with a WCD during the acute waiting period. The WCD enabled reevaluation of the mandatory criteria for ICD implantation after three months of follow-up.

2. Case report

A 60-year-old man with a history of diabetes mellitus and hypertension that had not been treated appropriately experienced crushing chest pain 10 days before admission accompanied by progressive dyspnea. ST segment elevation in the inferior leads and abnormal Q waves in the inferior and precordial leads were observed. Echocardiography revealed severe left ventricular (LV) dysfunction (LVEF 26.6%). Pulmonary congestion was noted on a chest radiograph.

On the 8th inpatient day, after his heart failure was stabilized, coronary angiography revealed total occlusion of the proximal right coronary artery (RCA) and 90% stenosis of the proximal left anterior descending (LAD) artery (Fig. 1A and B). Two days after angiography, the occluded RCA was successfully revascularized with a stent (Fig. 1C), and oral carvedilol at 2.5 mg/day was started.

On the 13th day, just before planned percutaneous coronary intervention for the LAD, he developed sustained monomorphic VT, which was terminated by 125 mg of intravenous amiodarone. However, he subsequently developed a hemodynamically unstable polymorphic VT requiring five electric cardioversions on the same day. Emergency coronary angiography revealed no subacute stent thrombosis or LAD occlusion; the LAD was urgently revascularized by stent implantation (Fig. 1D). Two days later, despite complete revascularization, he had another electrical storm in the coronary care unit and required seven electrical cardioversions that day. His hemodynamic status deteriorated significantly, necessitating management of his heart failure with deep sedation. During sedation, the dose of carvedilol was increased to 5 mg/day. After extubation, however, sustained VT occurred on the 23rd day, requiring electrical cardioversions twice that day.

A five-lead electrocardiogram showed recurrent VT triggered by the same morphologic VPC with a coupling interval of about 320 ms to the preceding QRS complex (Fig. 2). On the 25th

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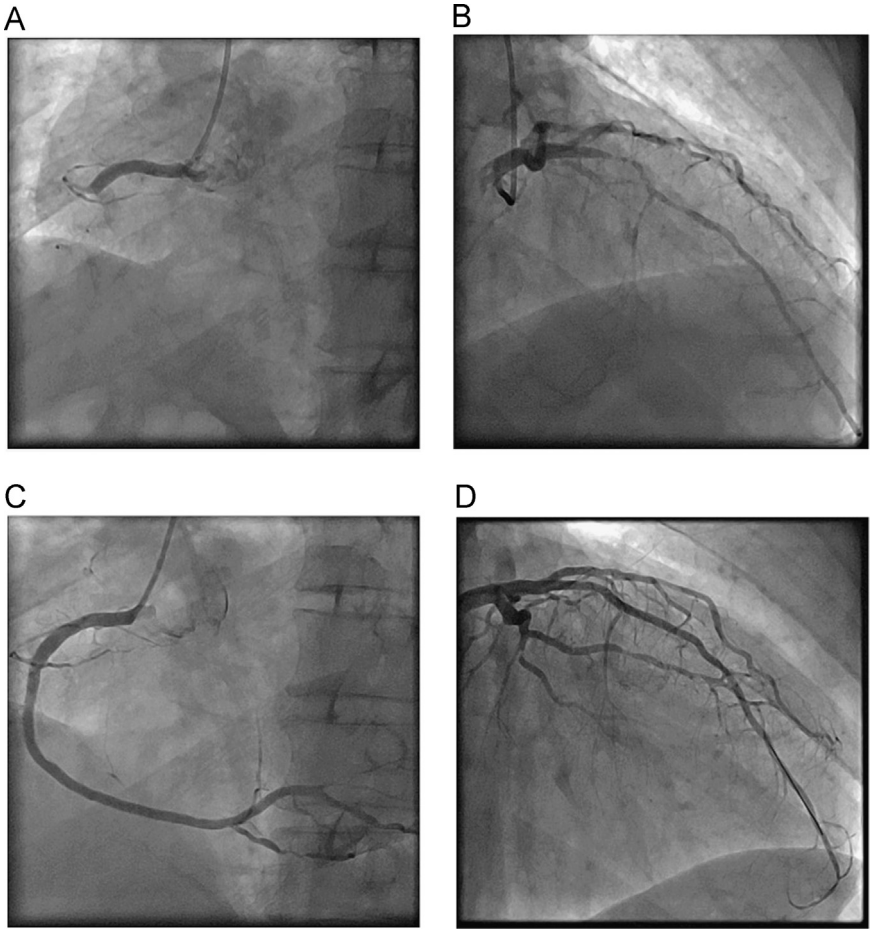

Fig. 1. Coronary angiography—the first coronary angiography: (A) total occlusion of the proximal RCA (LAO view) and (B) LCA with severe stenosis at the proximal LAD (RAO-cranial view). Coronary angiography—after stent implantation: (C) angiography of the RCA (LAO view) and (D) angiography of the LCA (RAO-cranial view). RCA, right coronary artery; LCA, left coronary artery; LAD, left anterior descending artery; LCX, left circumflex artery; RAO, right anterior oblique; LAO, left anterior oblique.

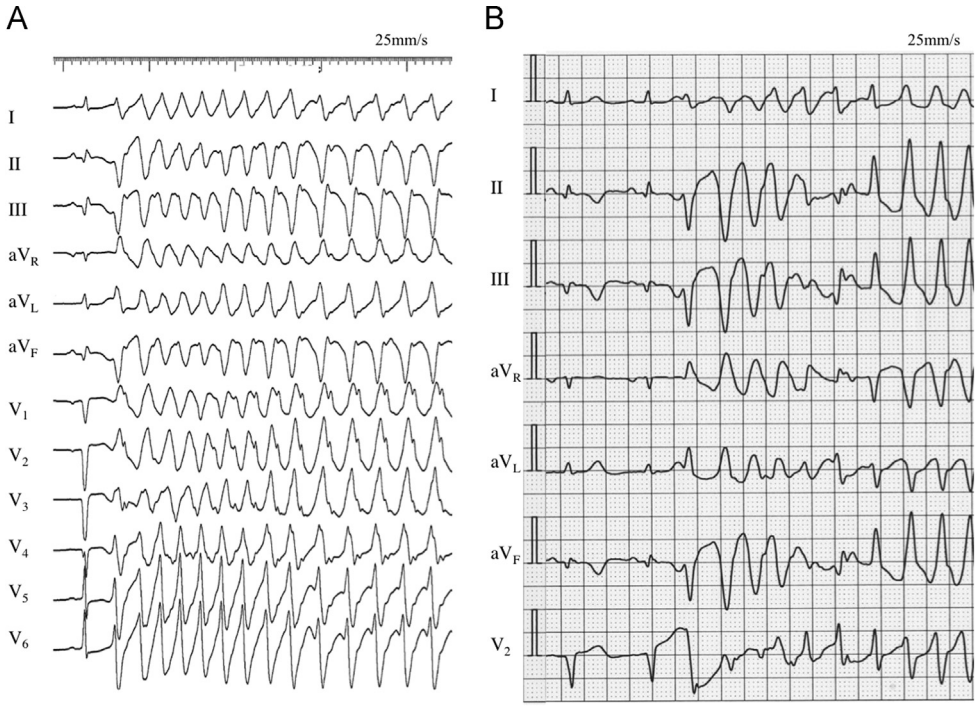

Fig. 2. (A) Twelve-lead electrocardiogram recorded during emergency coronary angiography on the 13th inpatient day. (B) Five-lead electrocardiogram monitor recording on the 23rd day showing recurrent ventricular tachycardia. Those episodes were always initiated by the same morphologic ventricular premature contractions.