



## Images in Electrophysiology

# An Alternative Way to Reach the Epicardial Focus of the Left Ventricular Tachycardia in a Patient with Non-ischemic Cardiomyopathy

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### Abstract

We report a case of a 69-year-old male with non-ischemic cardiomyopathy, having drug- and antitachycardia pacing-refractory ventricular tachycardia resulted in multiple ICD shocks. The sustained and intractable ventricular arrhythmia was mapped and ablated with the aid of the three-dimensional electroanatomic mapping system, initially performed but unsuccessful from the endocardial site then performed successfully from the epicardial site via the coronary sinus.

**Key Words:** coronary sinus; endocardial; epicardial; ventricular tachycardia

### Introduction

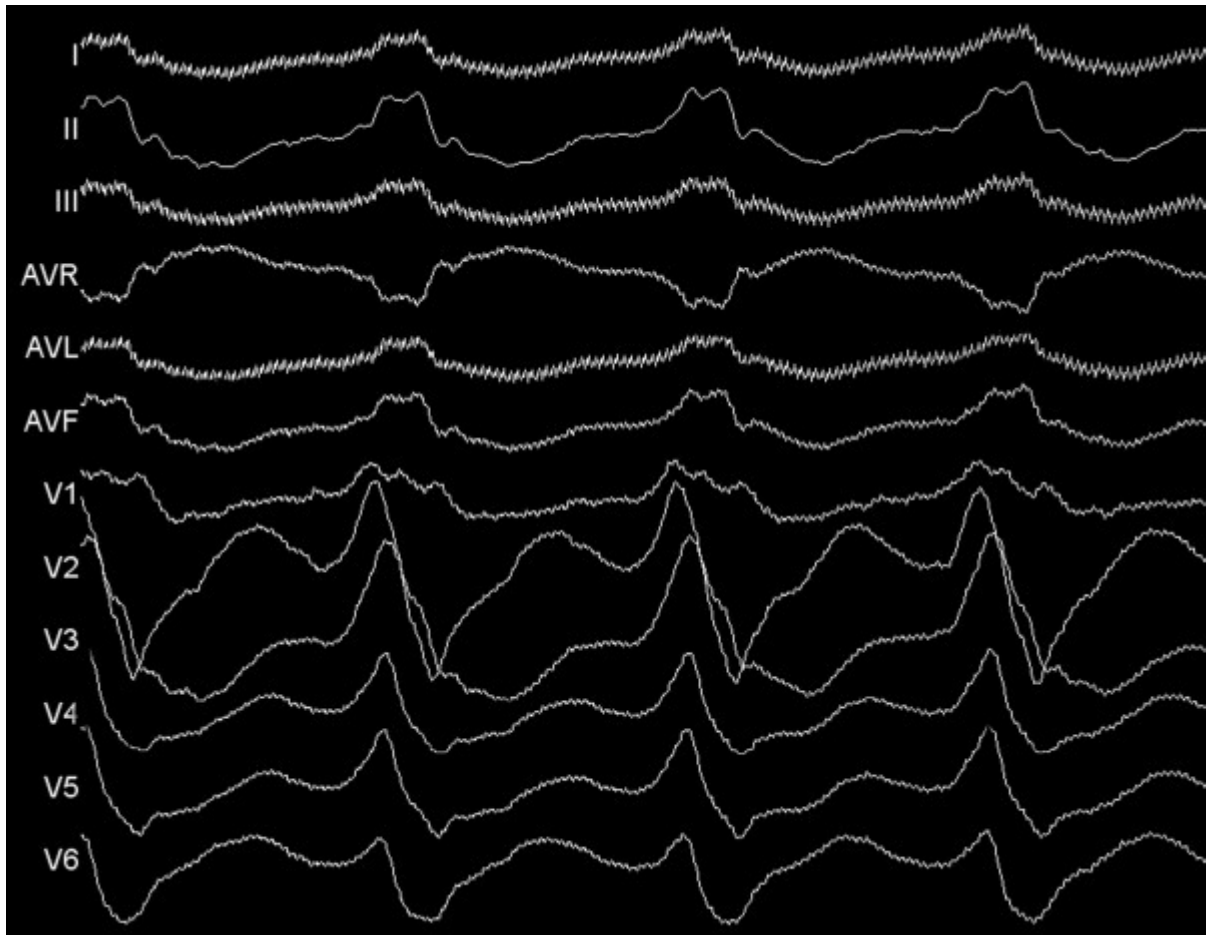
In some instances, catheter ablation from the epicardial aspect of the ventricles is needed although the majority of ventricular tachycardia (VT) is located and ablated in the right or left ventricular endocardium [1]. Epicardial VT ablation has been shown to improve outcomes in patients with non-ischemic cardiomyopathy (NICM) and is required for more than 30% of VTs in these patients [2,3].

### Case presentation

A 69-year-old male patient with NICM was referred to our department for multiple antiarrhythmic drug- and antitachycardia pacing-refractory ventricular tachycardia (VT) episodes resulted in electrical storm and depletion of the battery of his VVI-ICD. No secondary abnormalities causing the tachycardia were detected. Surface electrocardiogram during VT revealed a possible focus of the basal posterolateral wall of the left ventricle (**Figure 1**). Voltage-mapping during sinus rhythm demonstrated no identifiable scar tissue. Activation-mapping during the tachycardia using the Carto 3 electroanatomic mapping system (The Carto 3 System, Biosense Webster, Belgium) pointed out the same anatomic region for VT focus (**Figure 2**). In addition, tachycardia zone was marked by pacing and entrainment maneuvers that the earliest endocardial recordings were obtained as - 45 ms compared to QRS onset on activation mapping, pace mapping at this site generated a 12-lead ECG morphological match, and during entrainment maneuvers post-pacing interval was

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equal to tachycardia cycle length as 400 ms, and stimulus-QRS interval was equal to diastolic potential-QRS interval as 190 ms demonstrating the location was near the central portion of the isthmus (stimulus QRS/tachycardia cycle length = 48%). Endocardial radiofrequency energy applications to this region prolonged the VT cycle length without eliminating the tachycardia (red dots in **Figure 2**). Before entering the pericardial space, close anatomic relation with this endocardial region was through the coronary sinus (CS) epicardially. Irrigated tip ablation catheter (Navistar® Thermocool®, Biosense Webster, Belgium) was introduced and placed laterally in the CS. Endocardially obtained earliest local activation times were also detected on the epicardial site during the VT. Pace mapping from this zone resulted in matching of all 12-derivation ECG pattern of the VT as in the endocardial site (**Figure 3**). In addition, clear fragmented diastolic potentials were detected in sinus rhythm (white arrow in **Figure 2**). Before introducing radiofrequency energy, selective left system coronary angiography was performed because of close proximity to the circumflex artery (**Figure 4**). The safety distance from the artery was enough. Afterwards, multiple radiofrequency energy applications (450C, 25 W, 15 ml/min) on and around the pointed out zones finally stopped the VT. Programmed stimulation was repeated at least 30 min after the last delivery of radiofrequency energy to confirm the noninducibility of the VT. Easily inducible VT has never been induced anymore. Six-month follow-up period was asymptomatic.



**Figure 1.** Twelve-lead ECG showing the VT at a paper speed of 100 mm/sec.

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