

B-cell lymphoma of the pericardium presenting with ventricular tachycardia with a successful catheter ablation



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Introduction

Cardiac lymphoma is a rare malignancy of the myocardium and/or pericardium and is difficult to detect and diagnose. A diagnosis of a primary and secondary cardiac lymphoma is often made with ventricular tachycardia (VT) as a first symptom.¹⁻³ This case report illustrates a unique presentation of cardiac lymphoma.

Case report

A 62-year-old man with a history of congestive heart failure secondary to nonischemic cardiomyopathy, complete atrioventricular block, and a biventricular implantable cardioverter-defibrillator implantation developed an electrical storm related to an incessant VT refractory to amiodarone and mexiletine. He then underwent an electrophysiological study and catheter ablation of the VT. The clinical VT was easily induced by ventricular extrastimulation from the right ventricle (RV), and exhibited a left bundle branch block and left superior axis QRS morphology with a QS pattern in the inferior leads and a cycle length of 480 ms (Figure 1). Activation mapping was performed with a 7.5 French, 3.5-mm-tip irrigated ablation catheter (Navistar ThermoCool; Biosense Webster, Diamond Bar, CA), revealing a centrifugal activation pattern from the posterobasal septum in the RV, where a presystolic ventricular activation was recorded. Rapid pacing at this site revealed classic entrainment with a minimal fusion and long post-pacing interval (545 ms) (Figure 1). A couple of irrigated radiofrequency applications delivered at this endocardial site did not interrupt the VT. An attempt

to obtain a subxiphoidal pericardial access was then made, but it failed because of a dense pericardial adhesion. Later, a cardiovascular surgeon was consulted to create a pericardial window. Because the subxiphoidal pericardial window was not large enough for epicardial mapping of the VT, a median sternotomy was performed. The entire heart was encircled with very thick pericardial adhesions, producing constriction. After meticulous dissection, the epicardial RV could be mapped. Because the VT had become noninducible at this point, substrate mapping was performed, revealing a huge scar involving the entire epicardial RV containing several isolated diastolic potentials in the inferior wall (Figure 2). After an angiogram of the right coronary artery confirmed a safe distance from the right coronary artery, several irrigated radiofrequency applications targeting the isolated diastolic potentials were delivered, resulting in their elimination (Figure 2). Following this, the chest was closed. No complications occurred. A histopathologic examination and immunohistochemical stains of the pericardium revealed a large B-cell lymphoma, germinal center type, that had infiltrated into the soft tissue and skeletal muscle (Figure 3). Chest computed tomography revealed mediastinal, internal mammary, and cardiophrenic adenopathy. Chemotherapy was abandoned because the patient was unlikely to tolerate it. Although no VTs recurred on amiodarone 200 mg daily, the patient died of congestive heart failure a month later.

Discussion

VT is one of the manifestations of cardiac lymphoma. This kind of VT can be treated by chemotherapy for the lymphoma.^{2,3} In this case, an extensive epicardial invasion of a B-cell lymphoma caused a constrictive physiology and an electrical storm of a drug-refractory epicardial VT requiring an urgent catheter ablation. The

KEYWORDS Ventricular tachycardia; Epicardial; Lymphoma; Catheter ablation (Heart Rhythm Case Reports 2016;2:384-387)

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KEY TEACHING POINTS

- A diagnosis of a primary and secondary cardiac lymphoma is often made with ventricular tachycardia (VT) as a first symptom.
- This case report illustrates a unique presentation of a cardiac lymphoma. The extensive epicardial invasion of a B-cell lymphoma caused a constrictive physiology and an electrical storm of a drug-refractory epicardial VT requiring an urgent catheter ablation.
- This kind of VT can be treated by an epicardial radiofrequency catheter ablation with a sternotomy and pericardiectomy.

VT was successfully treated by an epicardial radiofrequency catheter ablation with a sternotomy and pericardiectomy. This case report illustrates a unique presentation of cardiac lymphoma.

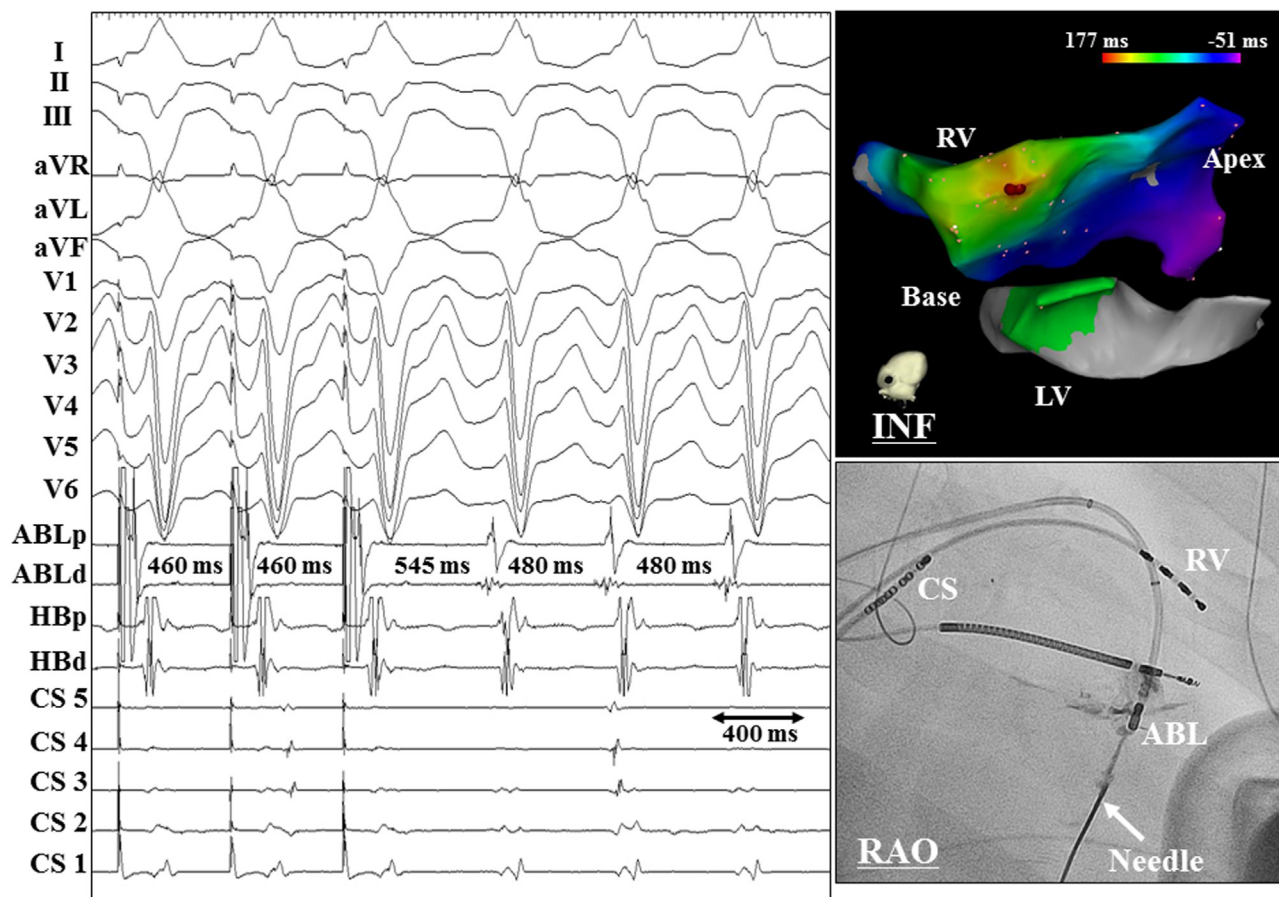


Figure 1 Cardiac tracings exhibiting entrainment pacing (*left panel*), an activation map (*right upper panel*) during the ventricular tachycardia (VT), and a fluoroscopic image exhibiting a failed pericardial access (*right lower panel*). The red tags in the activation map indicate the endocardial ablation sites. In the fluoroscopic image, the ablation catheter was positioned on the endocardial surface in the right ventricle. Note that the contrast was injected through the path of the needle into the right ventricle, suggesting the presence of a pericardial adhesion. ABL = ablation catheter; CS = coronary sinus; CS 1 to 5 = the first (most distal) to fifth (most proximal) electrode pairs of the CS catheter; HB = His bundle; INF = inferior; LV = left ventricle; RAO = right anterior oblique projection; RV = right ventricle; d, p = the distal and proximal electrode pairs of the relevant catheter.

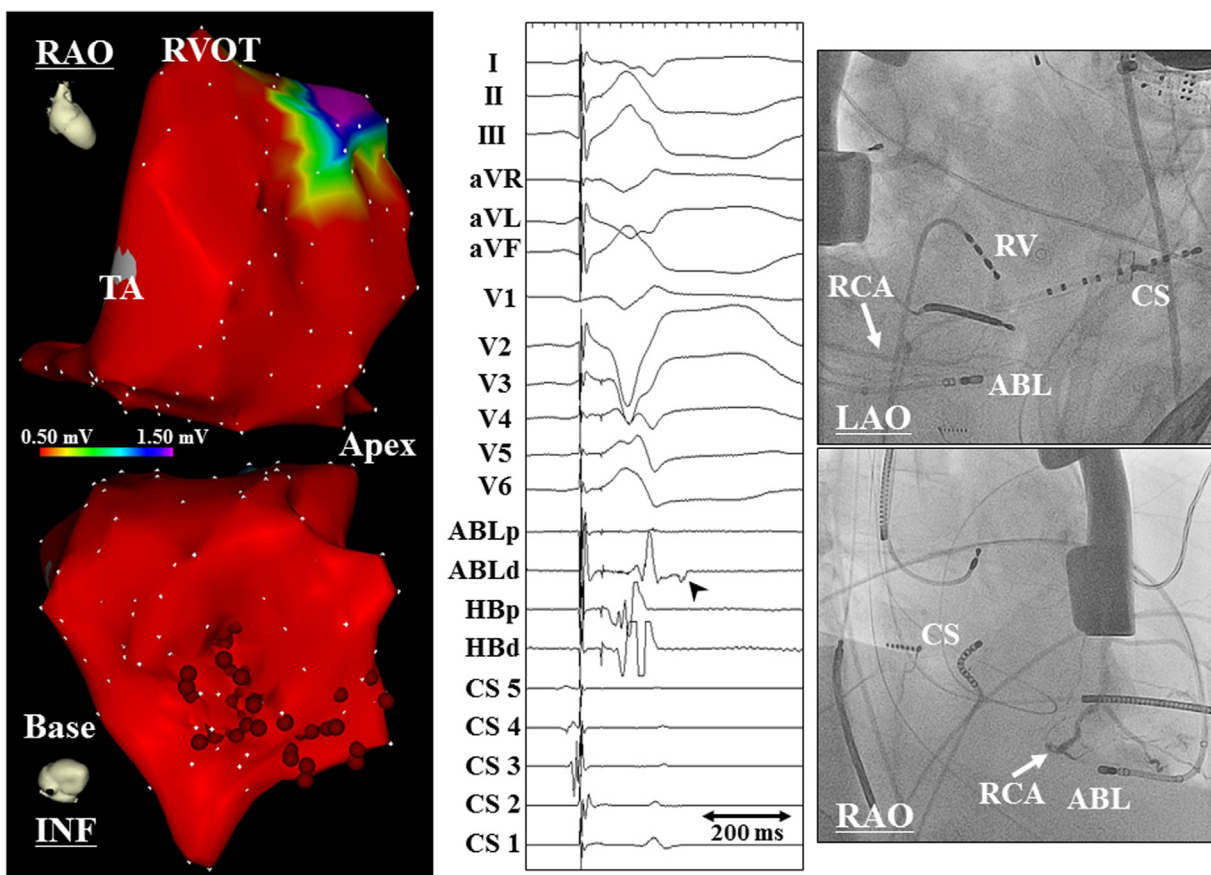


Figure 2 Voltage maps exhibiting an extensive epicardial scar and ablation sites in the right ventricle (*left panel*), cardiac tracings exhibiting an isolated diastolic potential (*arrowhead*) recorded on the epicardial surface (*middle panel*), and fluoroscopic images exhibiting the epicardial ablation site (*right panels*). The red tags indicate the ablation sites with isolated diastolic potentials. LAO = left anterior oblique projection; RCA = right coronary artery; RVOT = right ventricular outflow tract; TA = tricuspid annulus. Other abbreviations as in [Figure 1](#).

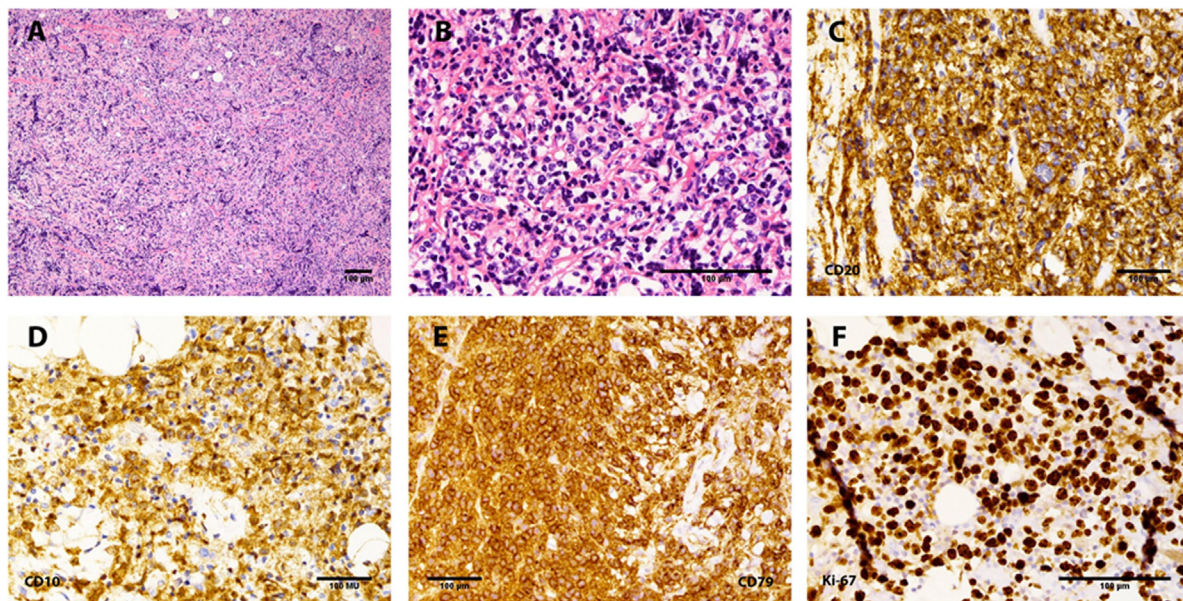


Figure 3 Histologic section of the pericardial specimen. (A) Low-power image showing diffuse lymphomatous infiltrates with fibrosis. (B) Higher magnification demonstrates large lymphoma cells in a fibrotic background containing large nuclei and a clear cytoplasm. (C) CD20 shows strong cytoplasmic positivity in the lymphoma cells. (D) CD10 stains approximately 60% of the lymphoma cells. (E) Lymphoma cells showing a strong cytoplasmic staining with CD79a. (F) Ki-67 shows a moderate to high proliferative rate (75%) in the lymphoma cells.

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