Radiofrequency catheter ablation of fascicular ventricular tachycardia in an elderly patient with complete atrioventricular block and VDD pacemaker

VDD pacemaker ve komplet atrioventriküler bloklu yaşlı bir hastadaki fasiküler ventriküler taşikardinin radyofrekans kateter ablasyonu

Introduction

Ventricular tachycardia (VT) which is not associated with any structural heart disease is known as idiopathic VT. Fascicular VT is the most common form of idiopathic VT of left ventricular origin. It is commonly seen in young patients without any structural heart disease. It is most common at the ages of 15-40 years (1). Fascicular VT is rarely seen in elderly patients (2). Radiofrequency (RF) catheter ablation is an important treatment option and offers cure in these patients (3, 4). In this manuscript, we report successful RF catheter ablation of fascicular VT in a 76 years-old male patient with complete atrioventricular (AV) block and VDD pacemaker. To the best of knowledge, this case is one of oldest patients reported so far.

Case Report

A 76-years-old male was admitted to our department because of palpitation. Blood pressure was 110/60 mmHg and heart rate was 178/minute during the tachycardia. He had a VDD permanent pacemaker implantation ten years ago due to complete AV block. A twelve-lead electrocardiogram demonstrated a wide QRS tachycardia with a right bundle branch block pattern and superior axis (Fig. 1). The tachycardia was terminated by intravenous verapamil. Control ECG showed ventricular pacing capture (V pace) compatible with VVI pacemaker. Pacemaker's mode switching program automatically switches from VDD mode to VVI pacing due to atrial fibrillation. Transthoracic echocardiography revealed mild mitral and aortic valve regurgitation. Systolic and diastolic functions and dimensions of both ventricles were in normal limits. Left ventricle ejection fraction was 65%. Coronary angiography was also normal.

An electrophysiological study was done. A standard diagnostic quadripolar electrophysiology catheter was advanced to the right atrium. At the AV node position, we realized complete AV block at infra-Hisian level. Then, diagnostic catheter was advanced to the right ventricle and programmed ventricular stimulation was done. Wide QRS complex tachycardia with right bundle block pattern and a superior axis was induced by programmed ventricular stimulation. VT of left ventricular origin was diagnosed. RF ablation catheter was advanced to the left ventricle by retrograde transaortic approach. The earliest ventricular activity during the tachycardia was recorded in the posterior region of the interventricular septum. Here, local ventricular activation was 33 millisecond earlier than the QRS complex at the surface ECG. RF catheter ablation (30 watts, 60 degrees) was performed in this region and the tachycardia was terminated. Current catheter positions were shown during ventricular tachycardia ablation (Fig. 2). Intracardiac electrograms were recorded at the site of successful ablation during ventricular tachycardia (Fig. 3). Programmed ventricular stimulation was repeated after RF catheter ablation and no tachycardia was induced. During the follow-up period of two months, the patient had no palpitation and no VT was found at Holter monitorization.

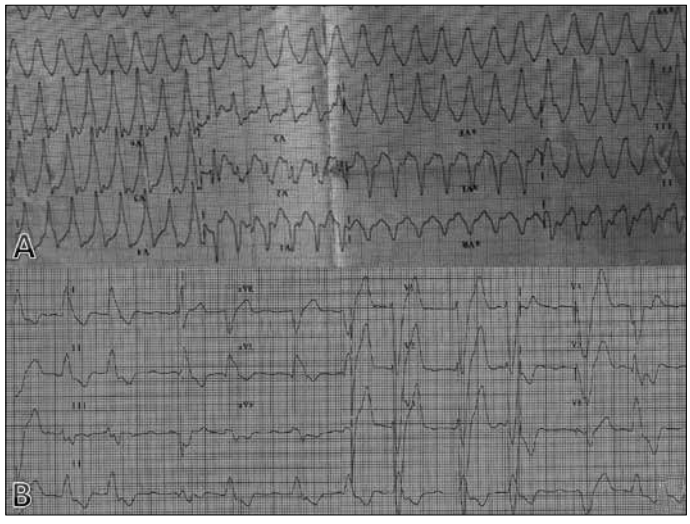

Figure 1. A) Surface ECG of the patient during tachycardia. A wide complex tachycardia with right bundle branch block pattern and superior axis is seen. B) Control ECG showed ventricular pacing capture (V pace) compatible with VVI pacemaker. Pacemaker program switches from VDD mode to VVI pacing due to atrial fibrillation

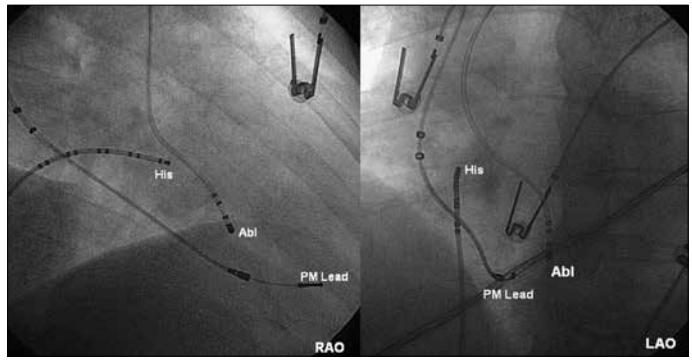

Figure 2. Left and right anterior oblique position, current catheter positions are shown during ventricular tachycardia ablation
Abl - ablation, PM - pacemaker

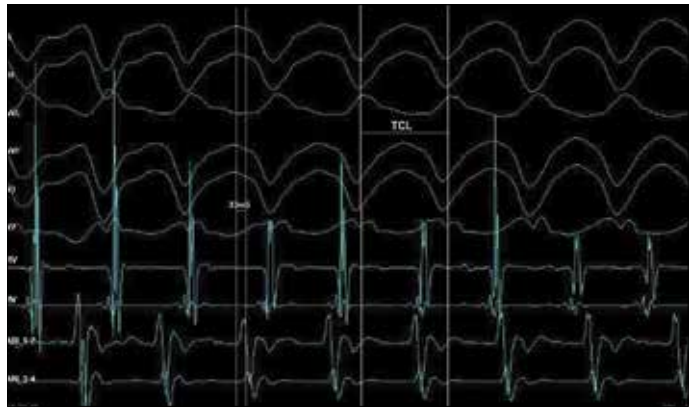

Figure 3. Intracardiac electrograms recording at the site of successful ablation during ventricular tachycardia
TCL - tachycardia cycle length

Discussion

Fascicular VT is a specific form of idiopathic VT that originates in or near the fascicles of left bundle branch. It is characterized by wide QRS complex (right bundle branch block pattern) and left-axis deviation. It is also known as verapamil-sensitive VT. Fascicular VT can be classified into three subgroups according to its site of origin as left posterior, left anterior and upper septal fascicle. Fascicular VT is a disease of young age. We found only a few reported patients over the ages of 50 years (3, 5, 6). The oldest patient we could find in the literature is 69 years old (3). Our patient is noteworthy because of the diagnosis of fascicular VT in a patient with advanced age. Furthermore, our case is interesting because a history of VDD pacemaker implantation due to complete AV block.

Because of preexisting complete AV block in our patient, a wide QRS tachycardia could only be a VT. Due to RBBB pattern, we have accepted that the tachycardia was originating from the left ventricle. In clinic practice; VT, antidromic atrioventricular tachycardia and supraventricular tachycardia with aberrancy should be considered for differential diagnosis of wide QRS complex tachycardia (7). In some patients with normal AV nodal conduction and dual chamber pacemaker, a pacemaker- mediated tachycardia should also be considered. Single chamber VDD pacemaker had been implanted due to complete AV block in our patient. For this reason, wide a QRS complex tachycardia with right bundle block morphology is diagnostic for VT of left ventricular origin. Our patient did not have a structural heart disease and ECG findings (RBBB, superior axis) were compatible with idiopathic VT. Additionally, the earliest ventricular activity was recorded in the posterior of interventricular septum during electrophysiological study.

Conclusion

As a result, idiopathic VT was diagnosed and successfully terminated with RF ablation.

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Myocardial 99m-Tc tetrofosmin reverse redistribution as a possible marker of tissue at risk

Risk altındaki dokunun olası belirteci; miyokardiyal 99m-Tc Tetrofosmin revers redistribüsyon

Introduction

The "reverse redistribution" phenomenon (RR) refers to a myocardial perfusion defect that develops on rest imaging, whereas scans acquired after stress show an apparently uniform distribution. This finding has been observed with thallium-201 (Tl-201) in a variety of cardiac conditions (1-5).

Tc-99m-labeled radio-pharmaceuticals may also yield a "reverse perfusion" pattern. As for thallium, some authors consider reverse perfusion of Tc-99m-labelled tracers a mere artifact, without clinical significance (6). Conversely, this phenomenon has been associated to coronary artery disease (7) and myocardial infarction (8). We had also described that the reverse perfusion pattern with Tc-99m tetrofosmin could be often observed in patients with previous myocardial infarction and normal coronary arteries (9).

We describe a sixty-year old patient with effort chest pain and reverse perfusion pattern at tetrofosmin Tc-99m SPECT who evidenced a significant stenosis on the proximal portion of the left anterior descendent coronary artery.

Case Report

A sixty year-old man was seen in April 2009 for the evaluation of typical effort chest pain of recent onset (2 months). He was an ex-smoker with mild hypercholesterolemia and no other cardiovascular risk factors. He had not reported previous cardiovascular events. He had been treated with several cycles of chlorambucil, endoxane and melphalan for chronic lymphatic leukaemia and, in 1997, autologous bone marrow transplantation. Since then, he had been doing well and without disease relapse. Follow-up echocardiography was normal. Resting electrocardiogram (ECG) showed diffuse repolarization abnormalities, while 2D echocardiography evidenced mild hypokinesis of the inferior apex. Treadmill exercise testing evidenced worsening of the pre-existent ECG alterations and was judged as not unequivocal. Tc-99m tetrofosmin SPECT imaging showed normal perfusion after stress test and apical hypo-perfusion at rest (Fig. 1). However, based on our previous experience and because of continuing symptoms, the patient underwent coronary angiography, that evidenced a 75% focal