Arrhythmogenic Right Ventricular Cardiomyopathy in a Patient Wıth Von Hippel Lindau Disease
Von Hippel Lındau Tanılı Hastada Aritmojenik Sağ Ventriküler Kardiyomiyopati

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Özet

Aritmojenik kardiyomiyopati, aritmi ve miyokardiyal yapısal anormalliklerin eşlik ettiği bir klinik tablo olarak tanımlanmaktadır. Aritmojenik kardiyomiyopati, çarpıntı ve ventriküler aritmiler gibi şüpheli klinik semptomları olan hastalarda düşünülmesi gereken, birden fazla test gerektiren bir hastalıktır. Von Hippel Lindau hastalarının %20'sinin feokromositoma ile ilişkili olduğu bildirilmiştir, ancak feokromositoma durumunda dilate kardiyomiyopati veya akut kalp yetmezliği gibi kardiyak etkiler yaygın değildir. Bu yazımızda literatürde yer almayan, olası birliktelik ve klinik antite bağlamında tartışmak amacıyla Von Hippel Lindau tanısı almış bir hastada Aritmojenik kardiyomiyopati olgusu sunulmaktadır.

Anahtar Kelimeler: Aritmojenik kardiyomyopati, Von Hippel Lindau

Abstract

Arrhythmogenic cardiomyopathy is defined as a clinical manifestation of arrhythmia and myocardial structuralab normalities. Arrhythmogenic cardiomyopathyis difficult to diagnose disease that requires multipletests, which should be considered in patients with suspicious clinical symptoms such as palpitations and ventricular arrhythmias. It has been reported the %20 of Von Hippel Lindau patients are related to pheochromocytoma, but cardiac effects such as dilated cardiomyopathy or acute heart failure are not common in the case of pheochromocytoma. In this study, we present a case of Arrhythmogenic cardiomyopathy in a patient who was diagnosed with Von Hippel Lindau in order to discuss two rare diseases in the context of possible association and the clinical entity that mayac company the absence in the literature.

Keywords: Arrhythmogenic cardiomyopathy, Von Hippel Lindau

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Introduction

Arrhythmogenic cardiomyopathy (ACM) is defined as a clinical manifestation of arrhythmia and myocardial structuralab normalities. Arrhythmogenic right ventricular cardiomyopathy (ARVC), an ACM, previously called "arrhythmogenic right ventricular dysplasia" (ARVD), is an insufficiently defined clinical condition characterized by fibrofatty replacement of the structural right ventricular (RV) myocardium and ventricular arrhythmias of right ventricular origin (1). The prevalence of ARVC in the general population is estimated to be around 1000 to 1:2000 (2,3).

ARVC is difficult to diagnose disease that requires multipletests, which should be considered in patients with suspicious clinical symptoms such as palpitations and ventricular arrhythmias. Cardiac imaging (with cardiac magnetic resonance imaging or transthoracic echo cardiogramalone) is recommended in addition to 12-lead and ambulatory ECG monitoring in patients with suspected ARVC diagnosis. Echocardiographic findings of ARVC can be summarized as right RV enlargement, akinesia, dyskinesia, oraneurysmareas. Histologically, in addition to fibrofatty infiltration of the myocardium, the observation of gap junction abnormalities in desmosomes in the RV myocardium on electronmicroscopy in most patients can be indicated as a finding suggesting that mutations in genesencoding desmosomalproteins may be responsible for ARVC (4).

Von Hippel Lindau (VHL) disease is an inherited, rare autosomal dominant familial syndrome, and the pathological VHL gene diagnostic for the disease is seen in the population at a rate of approximately 1:36000. The manifestations of Von Hippel Lindau disease with clinical conditions such as brain and spinal hemangioblastomas, pancreaticneuroendocrine tumors, renal cell carcinoma, retinal hemangioblastomas, pheochromocytoma, endolymphatic sac tumors, liver and lung cysts, epididymalcystadenomas has been described (5).

In this study, we present a case of ARVC in a patient who was diagnosed with VHL in order to discuss two rare diseases in the context of possible associationand the clinical entity that mayaccompany the absence in the literature.

Case Report

A 41-year-old female patient was diagnosed with VHL disease in 2019. DNA was extracted from the patient's peripheral blood and VHL gene-encoded 1-3. Exonsandexon-intronboundary regions

were examined by the PCR-DNA sequence analysis method. In thes tudy, it was found that the VHL gene carries p.Cys162Trp (c.486C>G) variation as heterozygous. Additionally, in the more extensive DNA sequence analysis, c.299G>A (p.Arg100His) heterozygous variant (NM_174934.3) was detected in the SCN4B gene. It was found that the daughter of the patiental so carried the variation of the VHL gene p.Cys162Trp (c.486C>G) as heterozygous as supporting the family history of her father. Mutations in the VHL gene cause VHL syndrome, which shows autosomal dominant inheritance.

In the 12-lead electrocardiogram (ECG) performed due to the patient's complaint of palpitation, findings such as prolonged S wave up stroke, epsilon wave, inversion of T waves in the right precordial leads, bundle branch block were found to suggest the diagnosis of ARVC. Afterward, ambulatory ECG imaging was performed to detect the presence of conditions such as premature ventricular complex/contraction and nonsustained ventricular tachyarrhythmias, which are among the minor diagnostic criteria of the disease (Figure 1,2).

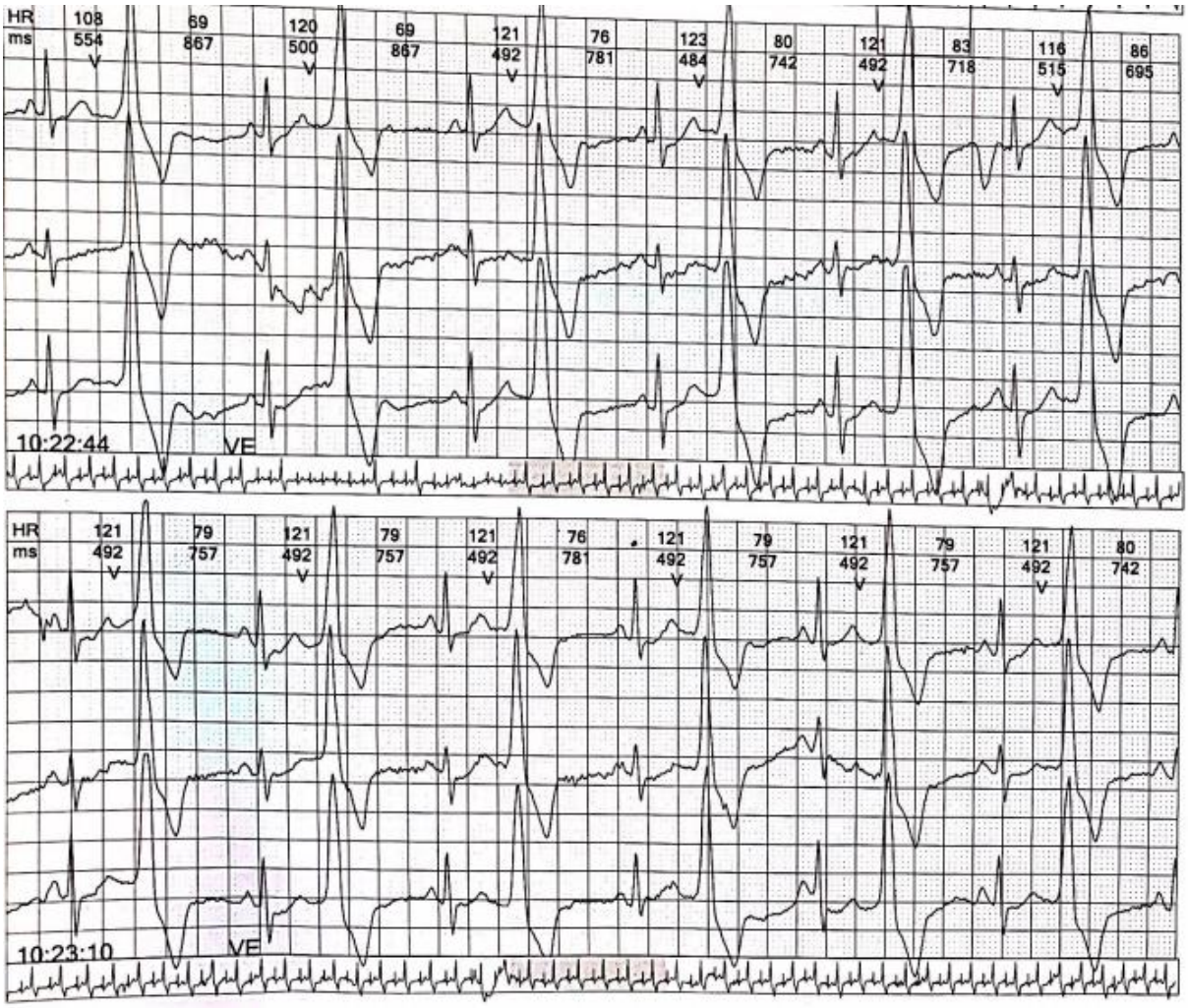

Figure1. An electrocardiogram is showing monomorphic ventricular tachycardia from a patient with arrhythmogenic right ventricular cardiomyopathy.

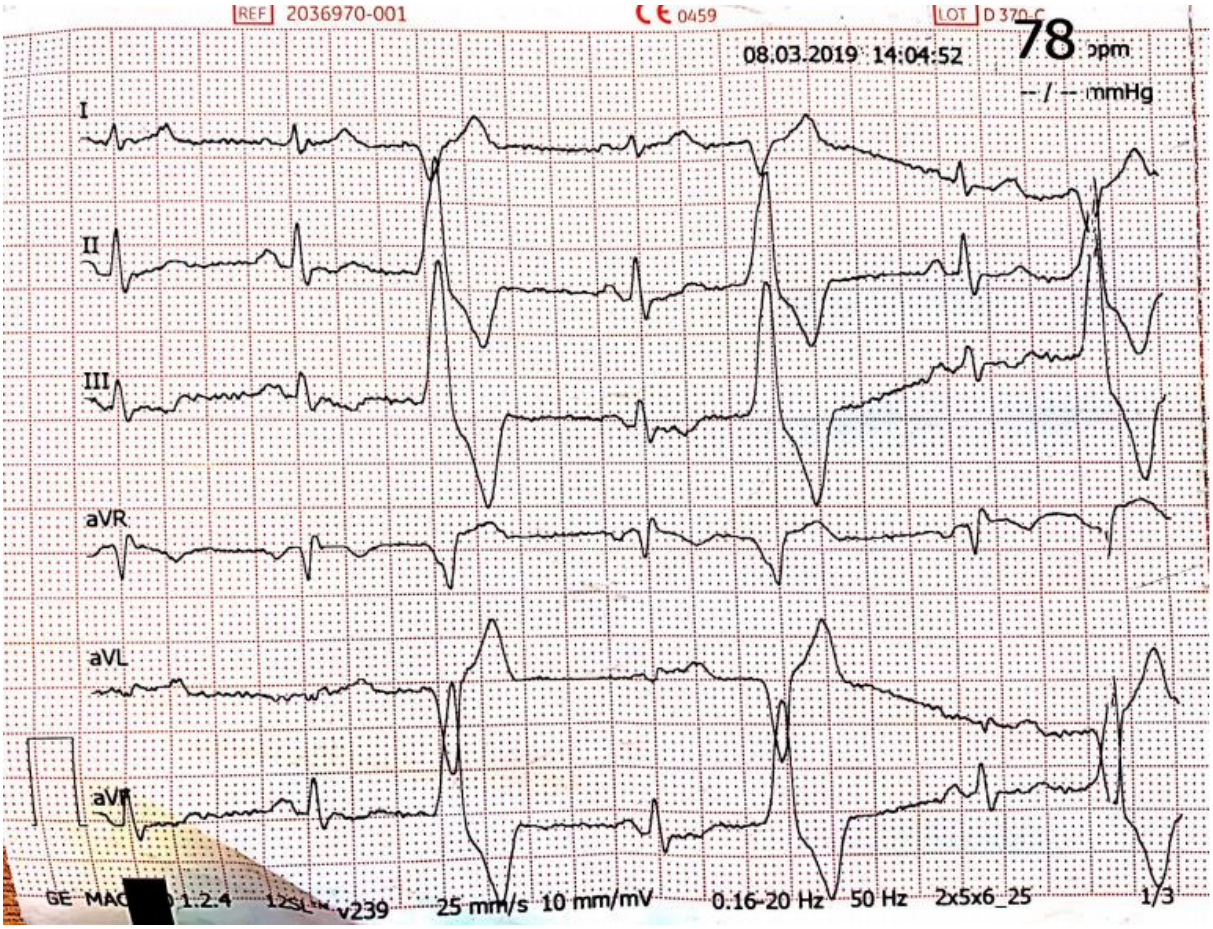

Figure 2. An electrocardiogram shows monomorphic ventricular tachycardia with a superior axis from a patient with arrhythmogenic right ventricular cardiomyopathy.

On follow-up, cardiac magnetic resonance (CMR) imaging, one of the non-invasive imaging methods performed in patients with suspected AVRC, was planned. Cardiac MRI showed dilated right ventricle, right ventricle out flow tract, and aneurysmatic dilatation in the pulmonary artery trunk. Although no pathological staining was detected in the first-passimagesfollowingtheadministration of contrastmaterial, mid-myocardialstainingwasnoted in the anterior wall of the right ventricle in 10 minutes late-phase images. This situation suggested fibrofatty replacement of the myocardium. It was thought that the findings of the patient, whose right ventricular apex was found to be dyskinetic in cine sequences, supported the diagnosis of ARVC.

Subsequently, patient with frequent symptomatic ventricular extrasystoles, an premature ventricular beatoriginating from the right ventricular out flow tract was detected by the electrophysiological test, and successful ventricular radio frequency (RF) ablation was performed with a complex mapping method.

Discussion

VHL is a rare genetic syndrome that increases the risk of developing various tumors of the central nervous system, kidneys, adrenal glands, and pancreas. VHL is a heritable multisystem cancer syndrome that is associated with a germ linemutation of the VHL tumor suppressor gene on the short arm of chromosome 3. Because of the complexitie sassociated with the management of the various types of tumors in this disease, treatment is multidisciplinary. A multispecialty team is needed for the optimum assessment and treatment of these patients. Comprehensiveserial screening and routine scheduled follow-up rare essential for proper care (6,7).

ARVC is cardiomyopathy characterized pathologically by fibrofatty replacement primarily of the RV and clinically by life-threatening ventricular arrhythmias in apparently healthy young people. Arrhythmogenic RV cardiomyopathy is recognized as a cause of sudden death during athletic activity because of its association with ventricular arrhythmias thata reprovoked by exercise-induced catecholamine discharge. Diagnosismay be difficult because many of the EKG abnormalities mimic patterns seen in normal children, and the disease often involves only patch yareas of the RV (8).

It has been reported the %20 of VHL patients are related to pheochromocytoma, but cardiac effects such as dilated cardiomyopathy or acute heart failure are not common in the case of pheochromocytoma. Apart from this, other clinical presentation that might cause a cardiac effect in this cases. Thus it was fascinating to detect isolated ARVC in patients with VHL diagnosis. This may be thought that catecholamines may have a cardiac effect through indirect discharge effect (9). When the literatüre is research, no cases have been reported in which the rare disease VHL and ARVC coexist. VHL clinical presentations are important as cardio vascular complications can be life-threatening. The coexistence of these two diseases is rare, and we think that patients diagnosed with VHL should have a multidisciplinary clinical approach in terms of cardiac involvement.

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