Tachymyopathy Due to Atrial Tachycardia With Two Mutually Dependent Foci: A Case Report

Ala Keykhavani,1 Ramezan Bakhshian,2,3,* Zahra Emkanjoo,3 and Mohammad Assadian Rad4

1Ziaean Research Center, Ziaean Hospital, Tehran University of Medical Sciences, Tehran, IR Iran
2Cardiac Electrophysiology Research Center, Jamaran Heart Hospital, Baqiyatallah University of Medical Sciences, Tehran, IR Iran
3Cardiac Electrophysiology Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, IR Iran
4Cardiac Electrophysiology Research Center, Heshmat Cardiovascular Medical and Research Center, Guilan University of Medical Sciences, Rasht, IR Iran

*Corresponding author: Ramezan Bakhshian, Cardiac Electrophysiology Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, IR Iran. E-mail: parsi_bakhshian@yahoo.com

Received 2015 December 22; Accepted 2015 December 22.

Abstract

Introduction: Multifocal atrial tachycardia is a supraventricular tachycardia caused by multiple arrhythmogenic sites in the atrium. We reported a unique pattern of bifocal atrial tachycardia originating from the left atrium.

Case Presentation: A 57-year-old female diagnosed with atrial tachycardia was referred to our center with incessant arrhythmia. The electrophysiological study was performed. The arrhythmia had two different atrial activation sequence. The arrhythmia was disappeared with ablation of the one focus.

Discussion: The patient underwent successful ablation of the first arrhythmia’s focus. The second arrhythmia’s pattern with eccentric atrial activation was eliminated with ablation of the first focus. The presence of two interdependent atrial foci during atrial tachycardia was the unique feature in this case, which to the best of my knowledge has not been reported earlier.

Keywords: Atrial Tachycardia, Changing P-Wave Morphology, Interdependent Atrial Foci

1. Introduction

Multifocal atrial tachycardia is a cardiac arrhythmia caused by multiple independent sites of competing atrial foci. The characteristic feature in electrocardiography (ECG) is variability in P wave morphology.

2. Case Presentation

A 57-year-old female presented with frequent episodes of sudden onset palpitation since 2 years ago, which was refractory to medical therapy. So, she was candidate for electrophysiological study. Transthoracic echocardiography demonstrated left ventricular ejection fraction (LVEF) about 30%. Electrocardiography during palpitation showed AT with alternative changing of P-wave morphology (Figure 1). Intracardiac tracings showed two different sites of earliest atrial activation (CSI-2, CS9-10) intermittently (Figure 2).

All episodes of AT were initiated with earliest activation in posterior septal area (CS9-10), followed by earliest activation in distal part of coronary sinus (CSI-2). Ventricular overdrive pacing with and without isoproterenol did not show ventriculoatrial conduction. So, concealed intermittent conduction via left lateral accessory pathway was ex-

Figure 1. A 12-Lead Electrocardiography was Recorded During Atrial Tachycardia
cluded. Therefore, we focused on posteroseptal area. Ablation in ostium and proximal part of coronary sinus was not successful. Mapping of left atrium was performed after interatrial septostomy. The best signal (50 msec earlier than surface P wave) was recorded in the posteroseptal part of the mitral ring. After ablation of the first focus in mentioned area, AT was terminated. Traumatic induced premature atrial complex (PAC) with ablation catheter in the posteroseptal part of mitral ring in many attempts was followed by another PAC similar to second morphology during AT. So, we concluded that second focus is depended to first focus and initiation of AT from first focus triggers the second focus.

3. Discussion

Atrial tachycardia with discrete and multifocal P waves may occur at rates more than 100 beats per minute. The relations of the P waves are variable. P waves may come randomly with alternating periods of sinus rhythm. It is seen most often in hypoxic patients with chronic bronchi- tis. The atrial tachycardia described in this presentation had a unique alternating concentric and eccentric atrial activation without intervening sinus beats. Intermittent conduction via concealed accessory pathway in a patient with premature ventricular contraction (PVC) has concentric and eccentric atrial activation. However, Patient with atrial arrhythmia and concealed accessory pathway has conduction via AV node in antegrade direction. VA dissociation with isoproterenol infusion can exclude presence of concealed left lateral accessory pathway. Atrial bigeminy or multifocal premature atrial contraction may have different P wave morphology with intervening sinus beats. As you see in (Figure 1), the arrhythmia could not be an atrial bigeminy. The atrial depolarization with eccentric atrial activation was always dependent on a preceding atrial beat originating from mitral ring in posteroseptal area. Elimination of the arrhythmia with ablation of the one focus confirms that the second focus triggers by the first one. We were not able to confirm any anatomical connection between two foci. VA was dissociated. Some patient may have more than one focus and different patterns of AT (1-3). However, alternating patterns of atrial activation and different P-wave morphology in regular pattern in ECG is rare, and we could not find this pattern in our searches. Left ventricular ejection fraction was returned to normal value (50% - 55%), three months later.

References