

A patient with J-point elevation and AV complete block presenting with recurrent syncope attacks

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Abstract

J point elevation, although mostly benign, has a spectrum that can lead to arrhythmias and can be mortal enough to cause sudden cardiac death. The arrhythmias seen in patients are frequently ventricular arrhythmias. In the literature, there are very few cases of complete atrio-ventricular block with J point elevation. Here, we present a case with J point elevation with syncope attacks and complete AV complete block.

Keywords: J point elevation, atrio-ventricular block, ventricular tachycardia

INTRODUCTION

The junction of the QRS and ST segment on the electrocardiogram (ECG) is called the J point. This region refers to the region where repolarization begins.¹ J point elevation is defined as an elevation of ≥ 0.1 mV in 2 consecutive leads on ECG.²

The association of patients with J point elevation with ventricular tachycardia and ventricular fibrillation is frequently emphasized in guidelines and case reports, and here we will discuss a case of J point elevation associated with AV complete block.

CASE

A 55-year-old man with no known medical history presents to the emergency department with an attack of syncope at work. Heart rate was 52/min, electrocardiogram showed J point elevation in D2, D3, aVF, V5, V6. Echocardiography showed normal left ventricular systolic function with no pathologic findings. Troponin value was within normal limits.

The patient was evaluated by neurology to determine the etiology of syncope and no pathology was observed. Neurologic causes were excluded and the patient was hospitalized in the intensive care unit for cardiac rhythm monitoring.

In the intensive care unit follow-up, AV complete block was observed on the monitor and atropine 1 mg was administered and sinus rhythm was provided in **Figure 1**. Since AV complete block was observed in the monitor recordings, coronary angiography was performed to exclude acute coronary occlusion in the etiology. Coronary angiography showed plaque in the coronary arteries.

Implantable cardioverter defibrillator (ICD) implantation was recommended to the patient with J point elevation on ECG and AV complete block ECG recording. The patient refused ICD implantation and was discharged voluntarily.

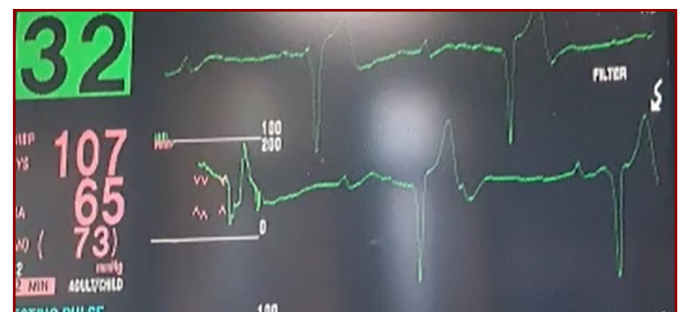


Figure 1. AV complete block on the monitor ECG

One week after discharge, the patient presented to the emergency department with a syncope attack again. The patient had a heart rate of 62/min, sinus rhythm, and J point elevation in D2, D3, aVF, V5, V6 on ECG in **Figure 2**.

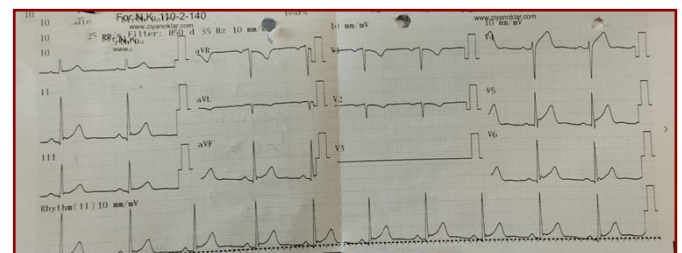


Figure 2. J point elevation in D2, D3, aVF, V5, V6 on ECG

ICD implantation was recommended instead of pacemaker implantation in the patient who had previously documented AV complete block due to the presence of J point on ECG and the knowledge that J point elevation may lead to arrhythmic events in the future. The patient accepted ICD implantation and ICD was implanted.

The patient presented to the emergency room 10 months after ICD implantation with the complaint of ICD shock. Battery analysis of the patient revealed ICD shock due to ventricular tachycardia.

DISCUSSION

J point elevation, also known as J wave syndrome or early repolarization, is a syndrome with a spectrum that may be a benign finding on ECG or may cause a mortal clinical condition such as sudden cardiac death.¹

While J point elevation is a benign condition usually seen in healthy people and athletes, studies have shown that some J point elevations can lead to ventricular arrhythmias.¹ In the studies, it has been observed that the localization lead of the elevation, morphology of elevation, and the height of the elevation may be associated with arrhythmia. The arrhythmogenicity of elevation in the inferior leads as the localization lead was observed to be higher.³ Early repolarization with slurring or notching morphology was observed to be more arrhythmic.⁴ A J-wave height >0.2 mV is also not considered benign.¹

According to the 2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death, ICD implantation is recommended as class I for patients returning from cardiac arrest in J point elevation with malignant characteristics.⁵ Patients in electrical storm with isoproterenol or quinidine are recommended an ICD as Class 2a. An implantable loop recorder (ILR) as Class 2a or an ICD as Class 2b is recommended for patients with high-risk early repolarization disease or a family history of unexpected sudden death at an early age or a family history of early repolarization syndrome.⁵

Our patient was an AV complete block patient with recurrent syncope attacks and was planned to be implanted with a pacemaker if J point elevation was not seen on ECG. However, since J point elevation was seen in the inferior and lateral leads on ECG, the patient was implanted with an ICD. The fact that the patient developed ventricular tachycardia 10 months later reminds us once again that ECGs of patients who will be implanted with a pacemaker for block should be carefully examined for early repolarization syndrome.

CONCLUSION

In patients with J point elevation, we should not only focus on ventricular tachycardia and ventricular fibrillation, but we should also be careful about atrioventricular block. Likewise, in patients presenting with complete AV block, we should also look at the ECG for early repolarization before directly indicating a pacemaker, and if there is evidence of early repolarization on the ECG, we should choose a pacemaker/ICD according to the guideline algorithms.

ETHICAL DECLARATIONS

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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