Paroxysmal Atrioventricular Block Induced by a Single Ventricular Premature Beat in the Absence of Overt Atrioventricular Conduction System Disease

Manish Undavia, MD; Avi Fischer, MD

Paroxysmal atrioventricular (AV) block is an unusual phenomenon that has been previously described. We report the case of a 78-year-old man who presented after an episode of syncope while seated in church. On presentation to the hospital, the initial electrocardiogram showed sinus rhythm with a normal PR interval, QRS duration, and corrected QT interval. During telemetry monitoring, several episodes of high-grade AV block were observed, and all episodes occurred after a single premature ventricular complex (Figure). AV conduction resumed after several nonconducted P waves (Figure). Ultimately, the patient was implanted with a dual-chamber pacemaker.

Advanced AV block has been known to occur after a single ventricular premature complex in patients with advanced His-Purkinje system disease. Transient AV conduction abnormalities, as a result of rapid ventricular pacing, is thought to occur as a result of depressed amplitude and excitability of Purkinje fibers and may require retrograde conduction to the Purkinje system.\(^1\) Perpetuation of the AV conduction disturbance may result from phase 4 block; however, this phenomenon generally occurs in the presence of preexistent intraventricular and AV conduction disturbances such as bundle-branch block and Mobitz II block.\(^2\) It has also been described in the absence of overt AV conduction disease. The precise mechanism for the occurrence of paroxysmal AV block remains speculative but is thought to be the result of concealed retrograde conduction into the abnormal His-Purkinje system. Retrograde activation after a single ventricular premature complex can either worsen or improve conduction by altering the degree of cellular uncoupling and the site of block.\(^3\) Under abnormal conditions, paroxysmal AV block can be observed after acceleration or deceleration of the sinus rate, because of prolonged refractoriness.\(^4\) Another possible explanation in our patient is that intra-Hisian conduction disease was present but not manifest on the surface electrocardiogram. On several occasions, the first QRS complex

![Image](https://example.com/image.png)

**Figure.** AV block after a premature ventricular complex. The sinus rate is unchanged before and after the AV block. Resumption of AV conduction occurs with a narrower QRS and with delayed conduction.
after AV block is narrower and conducted with delay, raising the possibility of equalized conduction delay within the His-Purkinje system.

In this patient, with no evidence of preexisting AV conduction disease on the surface electrocardiogram, paroxysmal AV block followed a single ventricular premature complex and led to syncope.

Disclosures

None.

References

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