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PSEUDO-ATRIOVENTRICULAR BLOCK

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A fragment of Holter ECG recording is presented, demonstrating a pseudo-second-degree atrioventricular block type II pattern, diagnosed by the presence of a non-conducted sinus P wave following a ventricular ectopic complex.

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In recent years, discussion of various electrocardiographic (ECG) phenomena has largely shifted to various groups and chats on the Internet. A frequent subject of discussions is the interpretation of non-conducted P waves following ventricular ectopic complexes (VECs). Incorrect interpretation of this ECG pattern as second-degree atrioventricular (AV) block type II (Mobitz II) can lead to unjustified referral of patients for pacemaker implantation [1-5].

We present a corresponding fragment from Holter ECG monitoring (Fig. 1). Among the sinus rhythm complexes, two VECs with identical coupling intervals are registered. Following the first VEC, a narrow, negative in the inferior leads P wave, retrogradely conducted through the AV node, is clearly visible. After the second VEC, there is no retrograde conduction of the impulse to the atria; however, a sinus P wave is recorded which is not conducted to the ventricles. This is due to the refractoriness of the AV junction induced by the VEC.

Interpreting this ECG pattern as second-degree AV block type II is incorrect. We should keep in mind that, according to the ACC/AHA/HRS 2018 guidelines, a mandatory condition for diagnosing second-degree AV block is P waves proceeding in a constant rhythm at a rate of less than 100 per minute.

The scheme presented in the lower part of Figure 1 demonstrates that premature ventricular contractions are capable of causing refractoriness of the AV node regardless of the presence or absence of retrograde conduction to the atria. In the latter case, the subsequent sinus P wave fails to conduct to the ventricles precisely due to refractoriness of the AV node induced by the premature ventricular contractions, rather than due to second-degree AV block. The prolongation of the next post-extrasystolic sinus cycle is usually interpreted as a consequence of a vagal reflex that occurs upon stimulation of aortic and carotid receptors at the moment of premature ventricular systole (ventriculo-phasic effect).

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Figure 1. A fragment of Holter ECG recording, the black arrow indicates a retrograde P wave; red arrows - sinus P waves; dashed circle - absence of a retrograde P wave; Pc - sinus P wave; P' - retrograde P wave; SN - sinus node; A - atria; AVJ - atrioventricular junction; V - ventricles; black horizontal lines - presumed AVJ refractory periods.