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# UNCONVENTIONAL RESULTS OF THE HOLTER MONITORING IN A PATIENT

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*Fragments of Holter monitoring of a 39-year-old patient with a combination of an electrocardiographic pattern of the ventricular preexcitation phenomenon and atrioventricular block are presented. The possibility of remote analysis of the patient’s monitoring electrocardiogram data in twelve leads is provided.*

**Key words:** holter monitoring; accessory pathway; atrioventricular conduction; pacing

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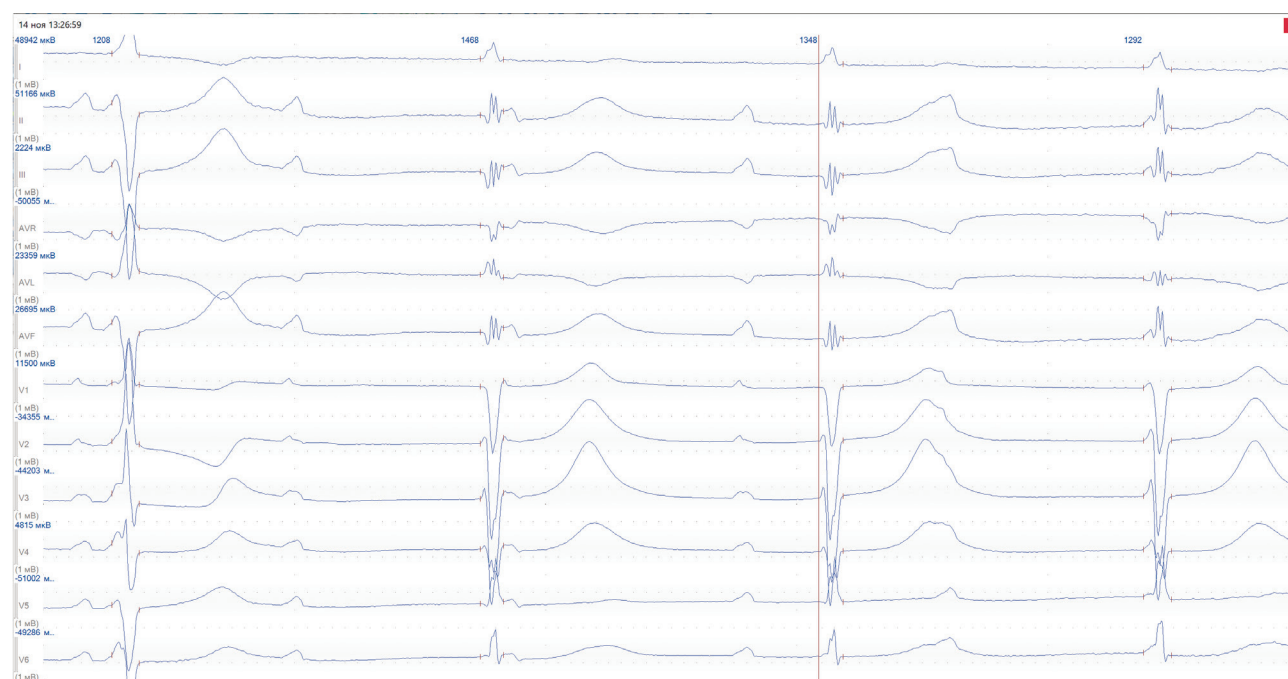
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The presence of “classic” signs of accessory pathways (AP), short PQ interval, delta wave, QRS widening and repolarization changes on the Holter monitoring or a standard ECG recording does not usually cause problems in diagnosing Wolff-Parkinson-White (WPW) phenomenon or syndrome. Sometimes, however, even in the presence of “classic” signs of WPW phenomenon or syndrome, there may be problems with identification. In cases where not all features of preexcitation are present, e.g. PQ interval is within normal limits or the delta wave is minimal and not accompanied by QRS prolongation above 120 ms and corresponding changes in repolarization processes, the

diagnosis is difficult to make. A transoesophageal or endocardial electrophysiological study and/or an intravenous adenosine triphosphate rapid test may help to confirm AP in such situations.

Less commonly, a combination of AP and atrioventricular (AV) conduction abnormalities is detected on Holter monitoring. In these patients, transoesophageal electrophysiological investigation and/or rapid intravenous adenosine triphosphate tests are usually not possible. The general clinical examination and a detailed analysis of the Holter monitoring data play a crucial role in making the correct diagnosis. Unfortunately, the physician who tran-



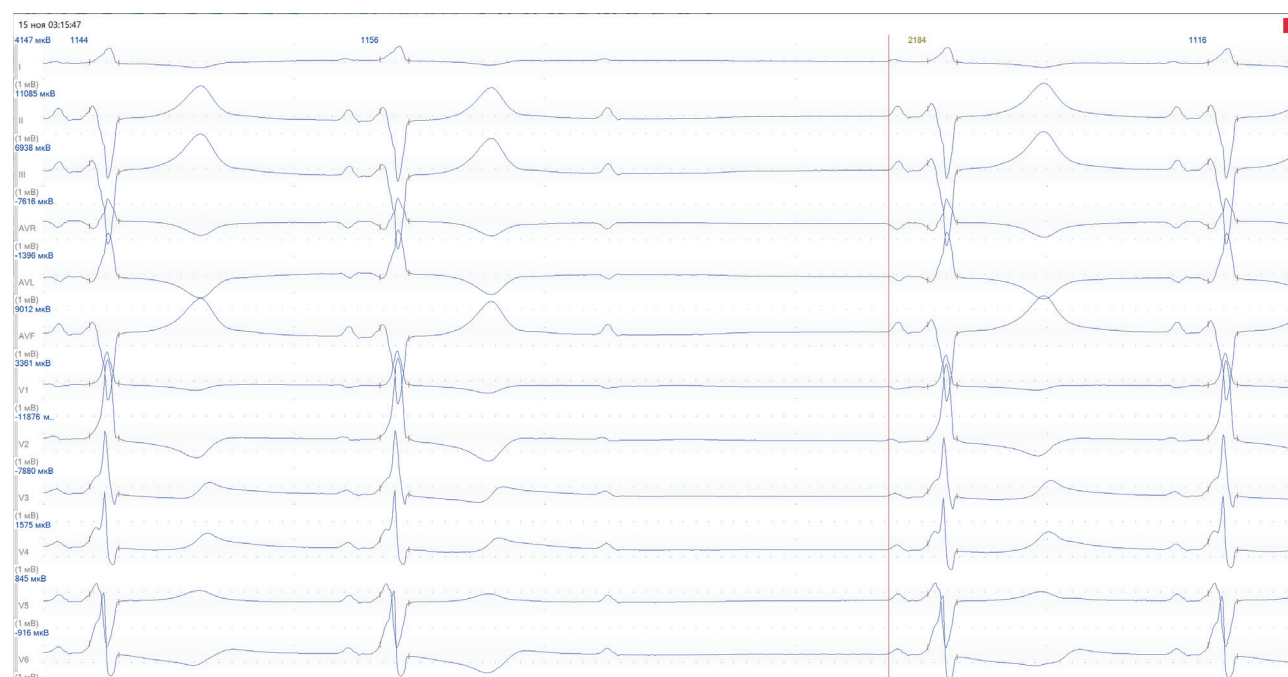
**Fig. 1.** Fragment of Holter monitoring of patient A., 39 years old. When atrioventricular block occurs, “wide” QRS complexes with signs of pre-excitation are replaced by “narrow” QRS complexes following in their own rhythm.

scribes the Holter monitoring data often does not have information about the patient's diseases and the therapy he or she is undergoing. The information available in the patient's Holter monitoring diary is insufficient and it is not always possible to discuss the ECG findings with the patient's doctor, especially in recent years when a significant proportion of Holter ECGs are transcribed remotely. Unfortunately, it is not common practise to write an epicrisis before performing a routine examination such as the Holter monitoring.

We have received monitoring data from patient A., 39 years old. At the time of the reading of the Holter monitoring, there was no information about her disease. Two

main types of QRS complexes were prominent (Fig. 1). Narrow QRS complexes up to 100 ms wide were predominant and followed their own rhythm independently of the P waves. Since the number of narrow QRS complexes was less than that of the P waves, the diagnosis of a AV block was beyond doubt. The low amplitude (no more than 600  $\mu$ V) and marked fragmentation of these QRS complexes in the limb leads, as well as the high amplitude, reaching 3000  $\mu$ V or more in leads V2 and V3, were striking in the contour analysis.

"Wide" QRS complexes, whose duration was of the order of 130 ms, followed P waves with an PQ interval



**Fig. 2.** Fragment of Holter electrocardiogram monitoring of patient A., 39 years old. Grade II atrioventricular block type 2 develops against the background of "wide" QRS complexes with the signs of pre-excitation.



**Fig. 3.** Fragment of Holter electrocardiogram monitoring of patient A., 39 years old. Against the background of atrioventricular block with "narrow" QRS complexes following in its rhythm, there are signs of retrograde conduction of excitation to the atria.

of about 130 ms. These complexes began with a tooth like the delta wave in WPW phenomenon or syndrome. Interestingly, a type 2 block AV (without Wenckebach periodicities) was also observed when following these QRS complexes - see Figure 2. Such a combination of

excitation conduction signs along the ECP and distal AV block seems rather unusual to us and requires an explanation. Interestingly, some of the close QRS complexes were followed by retrograde P waves with an RP' interval of about 100 ms (Fig. 3).

### **Annex**

We suggest that you form your own view of the patient and analyze the monitoring record. We will offer our interpretation in the next issue of the journal. To access the Holter monitor data described in this article remotely, please apply using the link <https://qrs.page.link/holter>. An email will be sent to the email address you provide within three working days with the relevant instructions. This option will be available during 2023.