

Answer to a quiz on page 25: Electrocardiogram

Patient woke up with feelings of palpitations, tachycardia, some fatigue and “heat in the face” at

23:41. Electrocardiogram (ECG) 2 (Fig.2.) was obtained at that moment. It shows clear sinus rhythm with some movement artifact.

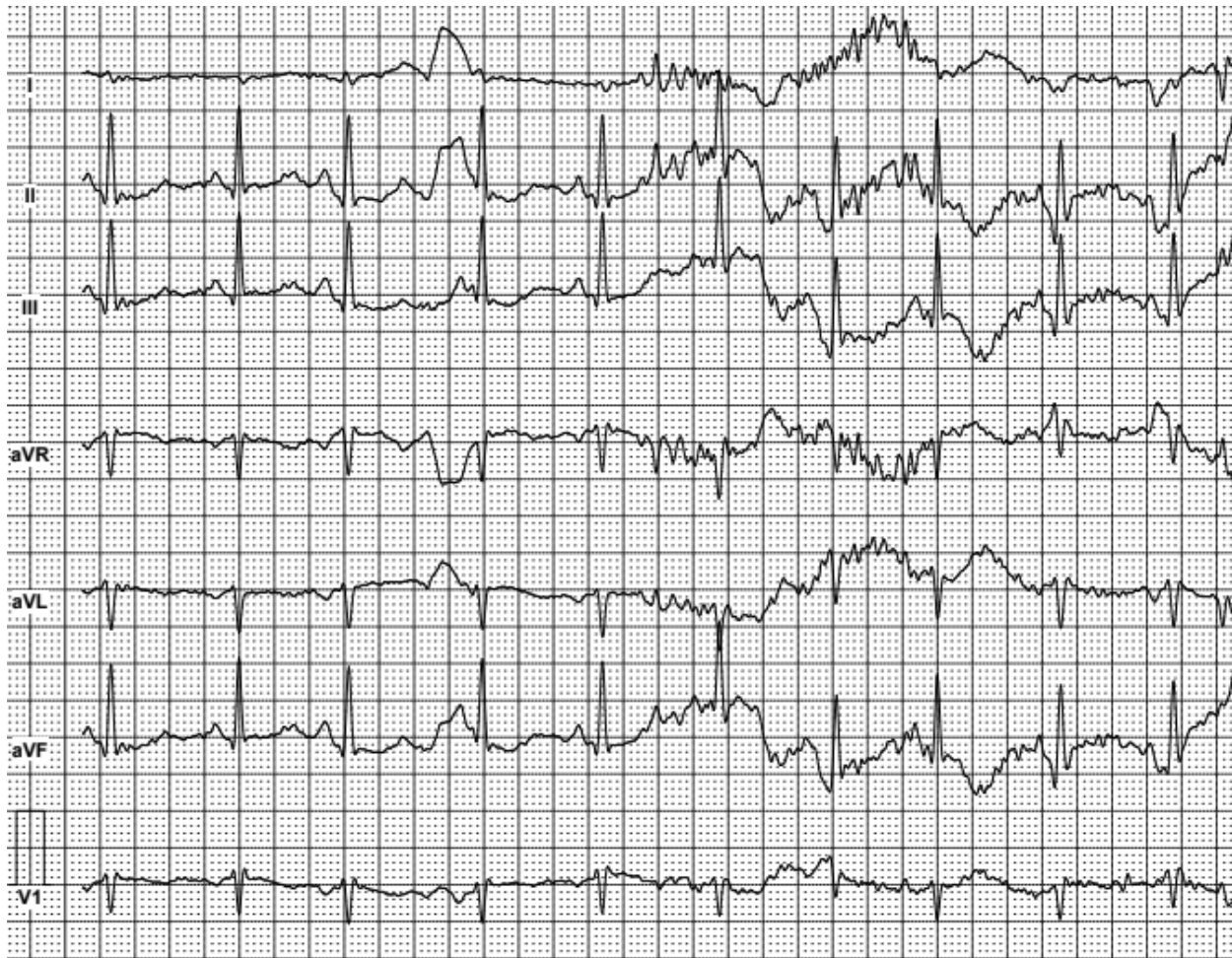


Figure 2. ECG 2
ECG- electrocardiogram

In several minutes patient went to the bathroom and washed her face with cold water. Being considerably agitated she started to shake her hands and splash water on her face. At that moment ECG 1 (Fig.1. page?) was recorded on 12-lead Holter monitor. “Shaking hands” artifact simulates some monomorphic ventricular tachycardia in most leads, except lead III. In lead III it simulates rather atrial flutter. Atrial extrasystole - 3rd PQRST on ECG 1 creates special intrigue mimicking a trigger of tachycardia.

Management of this artifact

First of all, clear narrow and almost rhythmic QRS complexes are seen in lead III. They exactly coincide with R waves visible in leads V2-V6 (grey lines on Fig.3.). This fact rules out wide complex tachycardia in this ECG and makes artifact more obvious.

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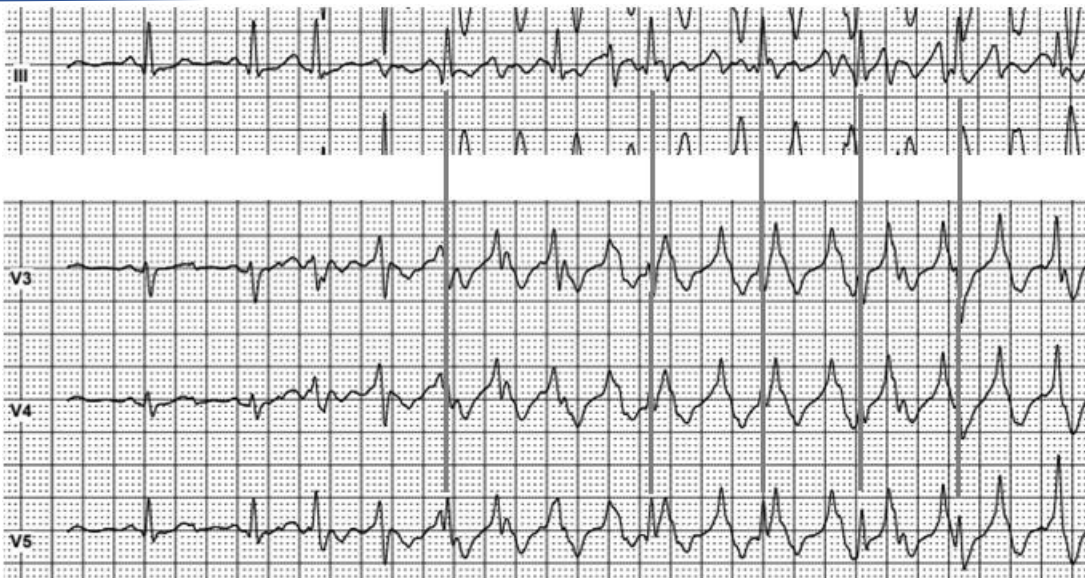


Figure 3. Fragment of ECG 1.
ECG - electrocardiogram

Another noteworthy moment is that ECG 1 is presented in decreased gain: $1\text{mV} = 5\text{mm}$.

In standard voltage $1\text{mV} = 10\text{mm}$ the same ECG looks really bizarre (Fig.4):

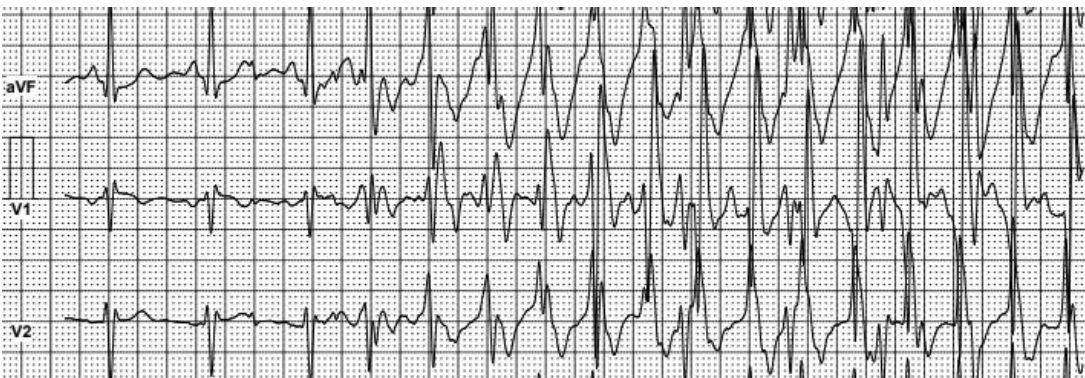


Figure 4. Fragment of ECG.
ECG - electrocardiogram

Artifact management algorithm

When you suspect an artifact on ECG you have to:

1. Discover the circumstances where this ECG was recorded
2. Specify the ECG recorder that was used for this ECG recording
3. Find out the possibility to repeat ECG of this patient
4. Clearly identify speed and gain of the ECG
5. Evaluate baseline of the ECG in general and in particular moments
6. Find out the least distorted by artifacts lead
7. Determine the lead where is the biggest amplitude of the QRS complex
8. Find out two (or even one) clear QRS complex and start searching other from this point

9. Always use the calipers, but do not forget about the possibility of extrasystoles and atrial fibrillation
10. You always can recognize this ECG as inappropriate for analysis

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