

Epsilon wave detected by an Apple Watch Series 5 in a patient with biventricular arrhythmogenic cardiomyopathy

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A 32-year-old man with a family history of sudden cardiac death due to arrhythmogenic cardiomyopathy (ACM) was admitted following a recovered ventricular fibrillation cardiac arrest. A family genetic study had detected that the patient carried a mutation on the desmoplakin gene.¹

Transthoracic echocardiography revealed a moderately dilated right ventricle with distal hypertrabeculation and decreased systolic

function. The left ventricle was also dilated and showed impaired global systolic function.

A conventional 12-lead electrocardiogram (ECG) was performed showing sinus rhythm, a slight deflection at the end of the QRS in V1–V2, and T-wave inversion in lateral leads (Figure 1).

In addition to standard ECG, quasistandard precordial leads were obtained with an Apple Watch Series 5,² displaying intraventricular

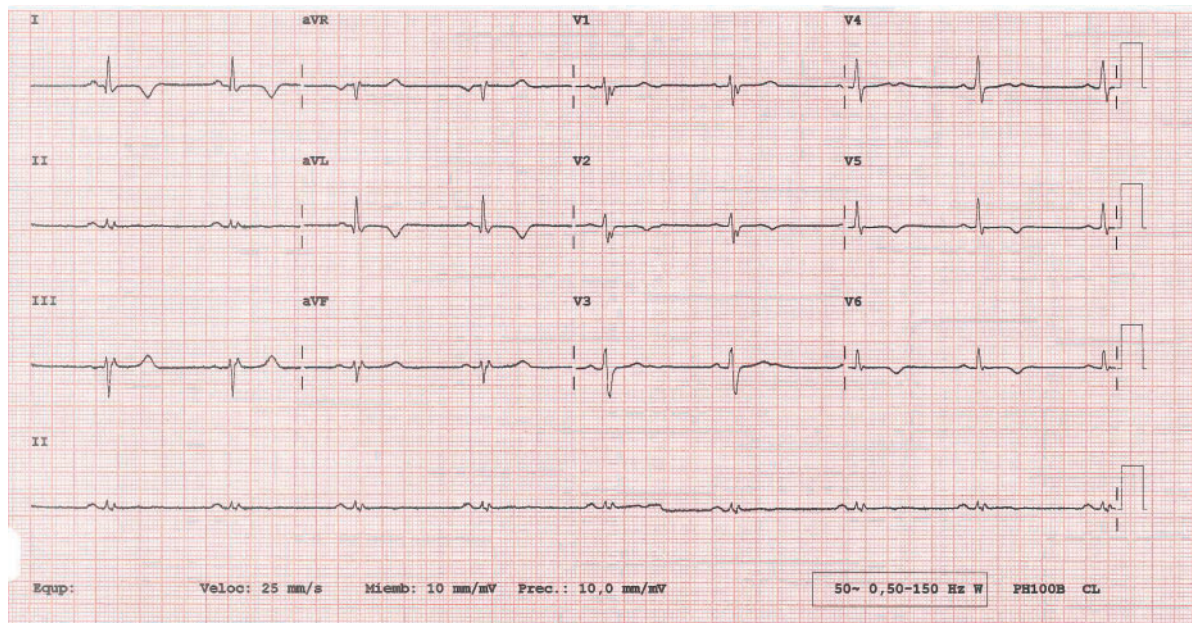


Figure 1 A conventional 12-lead electrocardiogram showing sinus rhythm, a slight deflection at the end of the QRS in V1–V2, and T-wave inversion in lateral leads.

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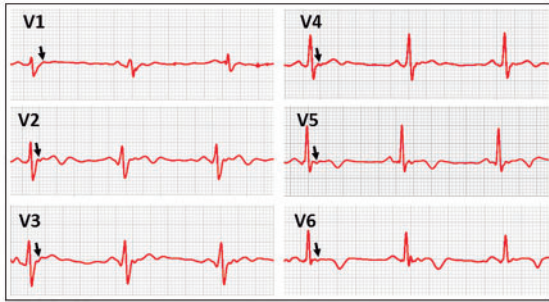


Figure 2 An Epsilon wave (arrow) in Apple Watch quasistandard precordial leads.

conduction delay, a low amplitude small deflection between the terminal portion of QRS complex, and the onset of the T wave in all precordial leads, as well as T-wave inversion in lateral leads (Figure 2, arrow).

This small deflection corresponds to an epsilon wave representing a post-excitation phenomenon of the myocytes in both ventricles.³

The Apple Watch registers precordial leads using an electrode on the right arm as negative pole, instead of using the classical Wilson's central terminal pole. Additionally, the output signal filter is higher (511 Hz) when compared with the conventional ECG. Despite tech-

nical differences, the resulting tracing is similar to the conventional one.

In conclusion, the Apple Watch can detect ECG pathological changes like epsilon waves thus contributing to the diagnostic of ACM.

Supplementary material

Supplementary material is available at *European Heart Journal - Case Reports* online.

Consent: The authors confirm that written consent for submission and publication of this case report including images and associated text has been obtained from the patient in line with COPE guidance.

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