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Electromechanical Association Artifact on Electrocardiogram (ECG) Mimics Acute ST-Elevation Myocardial Infarction

Elektrokardiyogramdaki (EKG) Elektromekanik İlişki Artefaktı Akut ST Yükselmeli Miyokard Enfarktüsünü Taklit Ediyor

CASE IMAGE
OLGU GÖRÜNTÜSÜ

A 40-year-old man visited our outpatient clinic for a routine cardiac examination before a job application. He did not report any symptoms related to cardiovascular diseases. His physical examination was unremarkable, and his blood tests were normal. An electrocardiogram (ECG) was obtained using self-adhesive electrodes. Since the initial ECG recording was abnormal, the limb leads were replaced, and a second ECG was taken. The first ECG showed ST-segment elevation in leads III and aVF, and ST-segment depression in leads I and aVL. No ST-segment alteration was observed in lead II. In the precordial derivations, slight ST-segment elevation was noted in leads V1-V3 (Figure 1A). The second ECG displayed the ST-segment on the isoelectric line (Figure 1B).

The electromechanical association artifact can closely imitate acute myocardial infarction and may not be easily recognizable, leading to misdiagnosis and unnecessary therapeutic interventions. This artifact on the ECG is generated by the movement of the electrode with each pulsation. Given that the precordial lead potential is not independent of the limb lead potential, the electromechanical association artifact is also expected to appear in the precordial leads. The bizarre ST-segment and T-wave may help physicians recognize the artifact, but these abnormalities are not always as obvious as in this case. If clinical evaluation is not consistent with acute heart disease, the ECG artifact should be suspected.

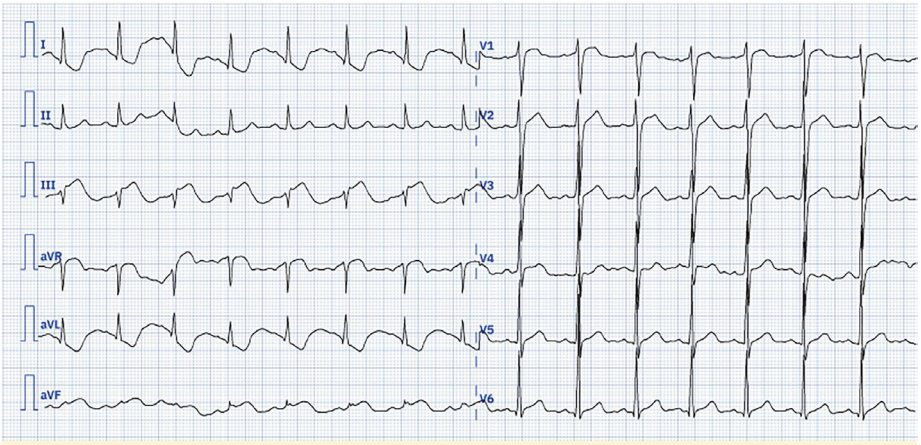

Figure 1A. The first electrocardiogram (ECG) displays the artifact as ischemia-induced ST-segment elevation.

Abdullah Kaplan[1]
Ömer Kıraslan[2]

[1]*Cardiology Clinic, Kemer Public Hospital, Antalya, Türkiye*
[2]*Department of Cardiology, Herz und Diabeteszentrum NRW, Bad Oeynhausen, Germany*

Corresponding author:
Abdullah Kaplan
✉ kaplanabd@gmail.com

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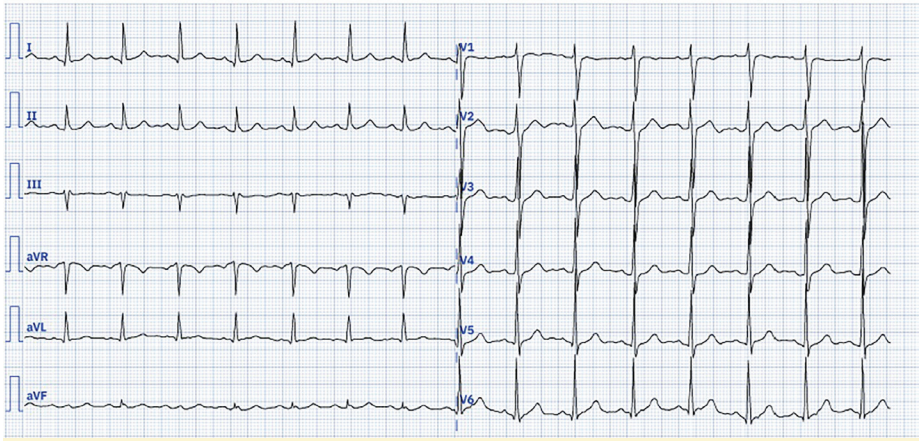

Figure 1B. No ST-segment elevation is observed on the second ECG after replacing the limb electrodes.

Informed Consent: Written informed consent was obtained from the patient.

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