Combination of hyperacute T waves and de Winter sign in precordial leads: a hybrid pattern equivalent to ST-segment elevation?

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Elevation of ST segment in at least 2 contiguous leads is the hallmark of acute thrombotic occlusion of a coronary artery. However, there are less frequent electrocardiographic patterns that may indicate acute coronary artery occlusion.[1,2]

We report a case of a 32-year-old man who presented to his local hospital with severe, ongoing central chest pain. He was a heavy smoker and had untreated dyslipidemia and a significant family history of coronary artery disease. Electrocardiography (ECG) performed on admission showed sinus tachycardia, hyperacute T waves in leads V1–V3, de Winter pattern in leads V4–V5, ST-segment depression in leads I, II, III, and aVF, and ST-segment elevation in lead aVR (FIGURE 1A and 1B). The levels of high-sensitivity troponin I were elevated at 340 ng/l (reference range, <0.14 ng/l). The patient was hemodynamically stable and after preloading with aspirin and ticagrelor he was admitted to the coronary care unit with a diagnosis of non–ST-segment elevation myocardial infarction. The pain gradually subsided after administration of intravenous nitrates and subsequent ECGs were similar to the one obtained at presentation.

The next day, troponin levels rose to 24 000 ng/l and the repeat ECG showed Q waves with ST-segment elevation in leads V1–V2 (FIGURE 1C). The patient's local hospital did not have a cardiac catheterization laboratory on site; therefore, he was transferred to our institution for emergency coronary angiography. Right coronary and left circumflex arteries were unobstructed, but there was a severe, long lesion with high thrombotic burden in the proximal segment of the left anterior descending artery (FIGURE 1D), which was treated with the implantation of a 3.5 × 34 mm drug-eluting stent with good angiographic result (FIGURE 1E). Predischarge transthoracic echocardiography revealed moderate left ventricular systolic dysfunction (ejection fraction of 40%) with severe hypokinesis in the mid-anterior (anteroseptal and apical) segments. Predischarge ECG showed Q waves in leads V1–V3 and deep, negative T waves in leads V2–V4 (FIGURE 1F).

De Winter sign was first described in 2008 as a new ECG pattern indicating occlusion of the proximal left anterior descending (LAD) artery. Instead of ST-segment elevation, there is a 1 to 3-mm upsloping depression at the J point in leads V1–V6 that continues into tall, positive, and symmetrical T waves.[3] A 1 to 2-mm ST-segment elevation in lead aVR often coexists.[3] In a single-center observational study of 1890 patients with anterior myocardial infarction, 2% showed this ECG pattern and, compared with the rest of the studied patients, they were younger, more often male and more frequently had hypercholesterolemia.[4] The authors concluded that recognition of this ECG pattern was important for early identification of patients that would benefit from immediate reperfusion therapy.

Hyperacute T waves are tall, positive T waves that are sometimes seen in the early phase of acute ST-segment elevation myocardial infarction. They represent a primary repolarization abnormality due to transmural myocardial ischemia.[5]

In conclusion, our case highlights that rare ECG patterns which can indicate proximal LAD occlusion, such as hyperacute T waves in precordial

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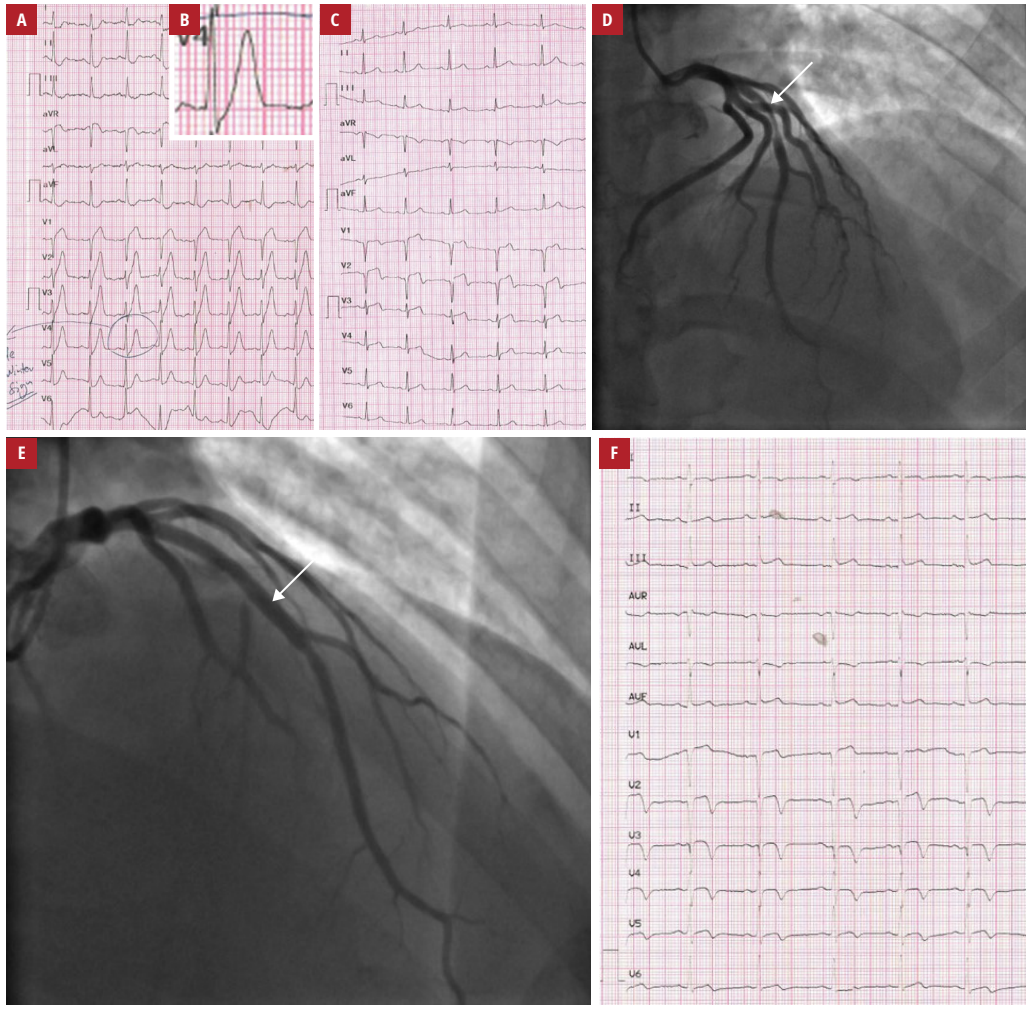

FIGURE 1 **A** – baseline electrocardiography (ECG) showing hyperacute T waves in leads V1–V3 and de Winter pattern in leads V4–V5, along with ST-segment elevation in lead aVR; **B** – de Winter pattern; **C** – ECG obtained the next day showing Q waves and ST-segment elevation in leads V1–V2; **D** – coronary angiography demonstrating a severe, long lesion with high thrombotic burden in the proximal segment of the left anterior descending artery (LAD; arrow); **E** – final angiographic presentation of the LAD post stenting (arrow); **F** – predischarge ECG showing Q waves in leads V1–V3 and deep, negative T waves in leads V2–V4

leads, de Winter sign, or a combination of these, should always be promptly recognized by physicians or paramedics so that an appropriate reperfusion strategy can be urgently implemented.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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