Specific electrocardiographic findings due to occlusion of the first diagonal artery

Birinci diyagonal arter tikanıklığının neden olduğu spesifik elektrokardiyografik bulgular

Introduction

The prediction of exact site of occlusion of the infarct-related artery by a noninvasive method immediately after admission to the hospital may help clinicians to estimate myocardial area at risk and to plan therapeutic interventions. The electrocardiography (ECG) is an effective noninvasive tool for rapid diagnosis of acute myocardial infarction. Some ECG criteria, which are usually underutilized by clinicians are presented to estimate precise location of culprit lesion for occlusions of both coronary arteries and their side branches. Below we report a case with specific ECGs due to occlusion of the first diagonal artery.

Case Report

Fifty eight-year-old woman was admitted to the emergency department due to angina pectoris lasting for about 10 hours. She had been using antihypertensive medication (enalapril 20 mg once a day) for 5 years and had been smoking for 10 years. At admission, systolic blood pressure was 140 mmHg, diastolic blood pressure was 80 mmHg, pulse rate was 90/minute, respiration rate was 20/minute and body temperature was 37.0 °C. Her physical examination was normal. Serum creatine kinase (CK), CK-MB and troponin-l levels were 390 U/L (35-195 U/L), 70 U/L (5-25 U/L) and 5 ng/mL (<0.1 ng/ml) respectively. Other blood tests were normal. On her electrocardiogram, interestingly, ST segment elevations in noncontiguous leads of aVL and V2; 2) ST segment depression in lead V5, disappearance of pre-existent septal Q waves in lateral leads and right bundle branch block (2-4). Lesion of the LAD coronary artery at the level of the first diagonal can cause ST elevation in both leads I and aVL or can cause association of precordial ST elevation with ST depression in lead aVL (5, 6). Also when ST elevation in leads I and aVL is together with ST depression in lead V2, the culprit lesion is usually in the first marginal branch of circumflex artery (7). The first diagonal branch of the LAD coronary artery supplies large area of the anterolateral wall of the left ventricle. As in our case, the occlusion of this branch can cause distinct electrocardiographic pattern due to the affected myocardial area. In many reports, the specific electrocardiographic features are defined as follows (7-9): 1) ST segment elevation in noncontiguous leads of aVL and V2; 2) ST segment depression in leads of III and aVF or V4-V5. This pattern represents a special subtype of anterior myocardial infarction, so called mid-
anterior myocardial infarction (8). Most of the anterior myocardial infarctions affect septal and apical regions of left ventricle. Anterior myocardial infarctions without apical or septal wall involvement are rare. Since blood supply by LAD coronary artery is not blocked in the case of the first diagonal branch occlusion, septal and apical regions are not affected.

Our case shows us that it is possible to predict exact site of culprit lesion in the clinical setting only by characterizing unique ECG patterns.

References