LETTERS TO THE EDITOR

ST-segment Elevation in V1-V3 in Patients with Inferior STEMI: An Important Sign of Right Ventricular Infarction

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To the Editor  
I read with great interest the article by Kurisu and Kihara that described the occurrence of ST-segment elevation (STE) in leads V1-V3 due to proximal right coronary artery (RCA) occlusion (1). In the setting of acute inferior ST-segment elevation myocardial infarction (STEMI), the presence of STE in V1-V3 is a known sign that should raise suspicion of a right ventricular (RV) infarction (2). However, this phenomenon is seldom present because the electrical current of injury from the left ventricle inferior infarction dominates the RV electrical forces blocking the appearance of STE in these leads (3).

In patients with inferior STEMI, the presence of STE in the anterior leads is either due to RV infarction or concomitant anterior STEMI. There are two main features used to distinguish between these conditions. First, in RV infarction, there is a reduction in the amplitude of STE from leads V1 to V3 (i.e., the amplitude of STE is highest in V1 and decreases towards V3), unlike that observed in anterior STEMI, where the amplitude of STE is lowest in V1 and increases towards V3. Another distinguishing feature (which is usually confirmed retrospectively) is the resolution of STE without the development of Q waves in cases of RV infarction (3). In these instances, a simple tool is to perform a right-sided chest leads ECG looking for STE in lead V4R, which is a powerful predictor of RV involvement. In the presented case, the amplitude of STE was V1>V2>V3 (on the admission ECG), and following reperfusion, the STE in V1-V3 resolved without the development of Q waves (on the ECG performed 16 hours later).

The presence of STE in lead III > lead II, ST-segment depression in aVL > lead I and RV infarction suggest that the RCA was the culprit vessel with a lesion proximal to the RV marginal branch. Awareness of the culprit vessel may provoke some cardiologists to target the RCA first (performing culprit vessel PCI rather than traditional catheterization), which will reduce the artery-to-balloon time and save several extra minutes during this very sensitive period for cardiac myocytes.

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References