

LETTER TO EDITOR

ECG Case Presentation: Acute Isolated Right Ventricular Myocardial Infarction Masquerading As Acute Anterior Myocardial Infarction

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DESCRIPTION

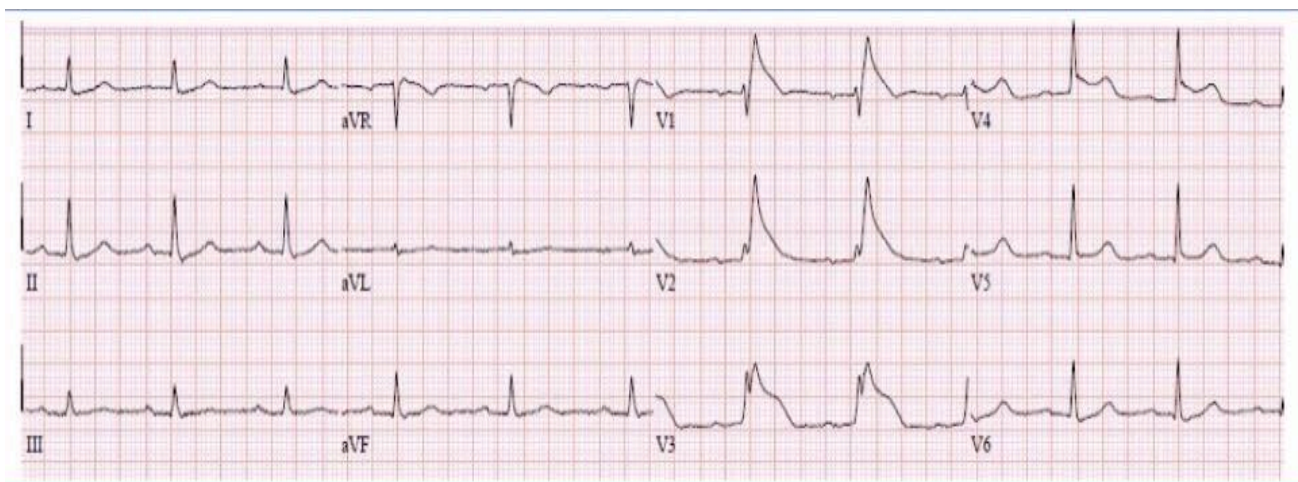
Right ventricular (RV) myocardial infarction (MI) often accompanies inferior left ventricular (LV) MI. However, isolated RV MI is very rare.¹⁻³ A 54 years old male presented with acute chest pain. ECG revealed ST segment elevation in leads V1-V4 (figure-1). He was taken to the cardiac catheterisation laboratory with presumptive diagnosis of acute anterior MI. However, angiography revealed a normal left coronary artery (figure-2A) and normal LV systolic function. The right coronary artery (RCA) was occluded proximally (figure-2B). A percutaneous coronary intervention (PCI) was performed. Post-PCI angiogram revealed a non-dominant RCA (figure-2C). ECG after PCI revealed a significant decrease in the injury current in the right-precordial and mid-precordial leads (figure 3). Peak serum troponin was 25.2 ng/mL. This case demonstrates that isolated acute RV MI due to occlusion of a non-dominant RCA can masquerade as acute anterior MI.

MECHANISM OF ANTERIOR PRECORDIAL ST ELEVATION IN RV-MI

The right ventricular (RV) is anterior to the left ventricular (LV), with the RV free wall underlying the right-precordial and mid-precordial ECG leads (figure-3A). In isolated RV myocardial infarction (MI) the RV free wall remains electrically more positive than the LV after initial ventricular depolarization (i.e, during inscription of the ST segment), which accounts for the ST segment elevation in leads V1-V4.

CLINICAL IMPORTANCE

Recognition of the ECG presentation of isolated RV MI has important management implications. Hypotension due to isolated RV MI is treated with aggressive intravenous fluid infusion, whereas hypotension due to acute anterior MI is often treated with inotropes, vasopressors and less aggressive fluid management. In the catheterisation laboratory serial imaging of the left coronary artery (in an attempt to find the anticipated culprit lesion) can delay right coronary artery (RCA) reperfusion. In our patient 12 min were spent imaging the left coronary artery before injecting the RCA.



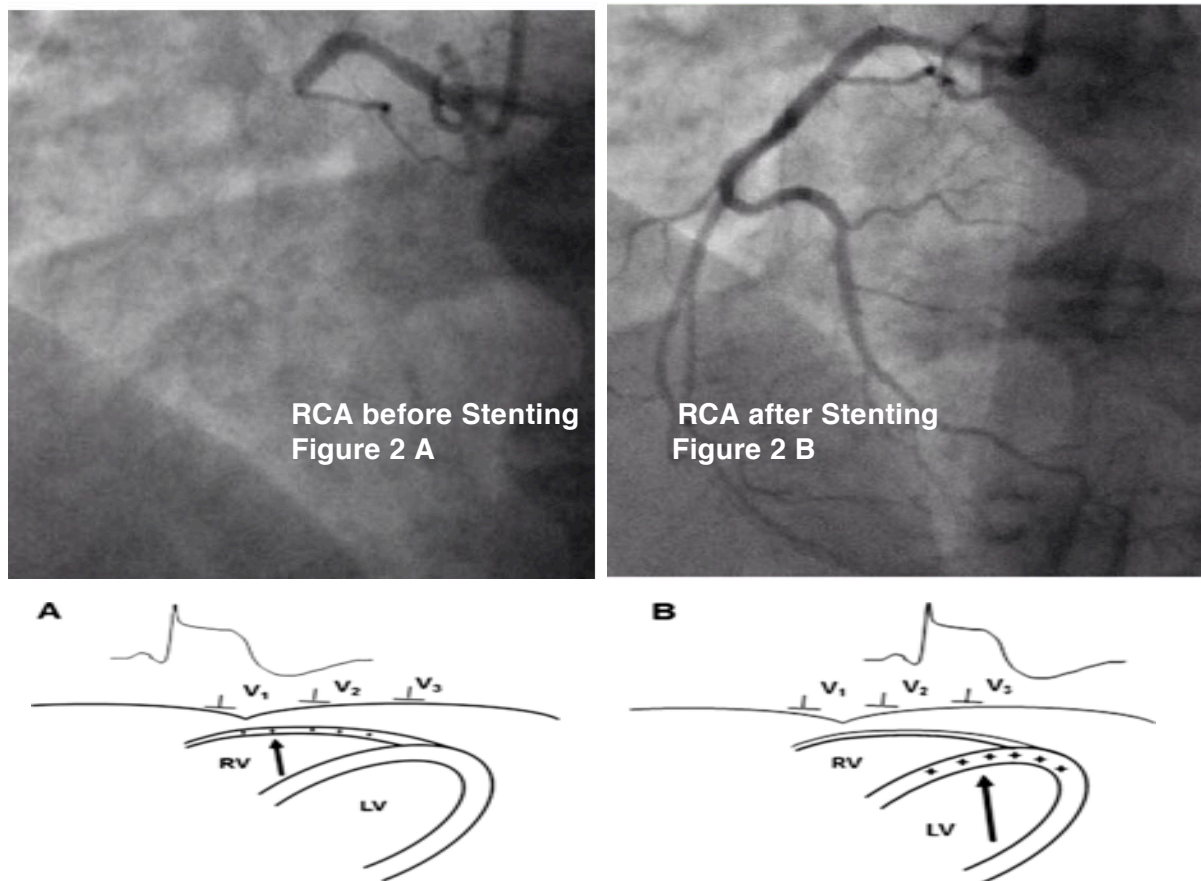


Figure-3: Illustration of mechanisms of ST elevation in isolated right ventricular (RV) versus anterior myocardial infarction (MI). (A) Acute RV MI produces incomplete depolarisation (depicted by dots “.”) of RV free wall and positive injury current (arrow) in leads V1–V4. (B) Acute anterior MI produces incomplete depolarisation of anterior left ventricular and positive injury current in leads V1–V4.

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