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ECG Localization in ST-Elevation Myocardial Infarction: Spotting the Zebra Among the Horses

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A 50-year-old male presented with angina pectoris at rest for four hours. On clinical examination, the patient was hemodynamically stable. A twelve-lead ECG was done (Fig. 1, Panel A) which showed a sinus rate of 72 bpm with ST-segment elevation in the precordial leads V1 to V6 and the inferior leads II, III and aVF with ST-segment depression in aVL >1 mm. In the frontal plane, the ST-segment elevation was more pronounced in lead III than lead II. The frontal ST-segment axis was 90°. The ECG post revascularization (Fig. 1, Panel B) showed resolution of ST elevation with presence of Q waves in the inferolateral leads and a distinctive absence of Q waves in the anterior precordial leads V1–V3.

The coronary angiogram (Fig. 1, Panel C, D) showed a tight stenosis in the proximal dominant right coronary artery with slow flow in the right ventricular branch and with a large posterolateral branch with no significant stenosis in the left coronary artery. Primary percutaneous coronary intervention with stenting was done, and there was restoration of flow with resolution of chest pain and ECG changes.

ST-segment elevation throughout the precordial leads is almost always interpreted as indicative of occlusion of left anterior descending artery. However, it is important to remember that when combined with ST-segment elevation in the inferior leads, a close differential is inferior wall STEMI with

predominant right ventricular infarction caused by the occlusion of the right coronary artery proximal to the right ventricular branch, as reflected in this case. The ST-elevation in leads V1–V4 may occur due to the occlusion of the right ventricular branch [1]. The ST-elevation in V5–V6 may be explained by the occlusion of a dominant right coronary artery which is also perfusing the postero-lateral wall [2]. In addition, right ventricular dilation, as was present in this case, can lead to clockwise rotation of the heart leading to ST elevation in the left precordial leads.

The clue here is to recognize that the maximum amount of ST-elevation occurs in the inferior leads. In addition, the presence of ST elevation in the right sided precordial leads, as in this case, and the absence of Q waves development in the anterior leads [3], favours the occlusion of the proximal right coronary artery with right ventricular branch involvement over the distal left anterior descending artery.

Author's contribution

Jaskaran Singh Gujral: Conception and design of Study, Literature review, Acquisition of data, Research investigation and analysis, Data collection, Drafting of manuscript, Research coordination and management.

Abhinav Shrivastava: Conception and design of Study, Acquisition of data, Analysis and interpretation of data, Research investigation and analysis,

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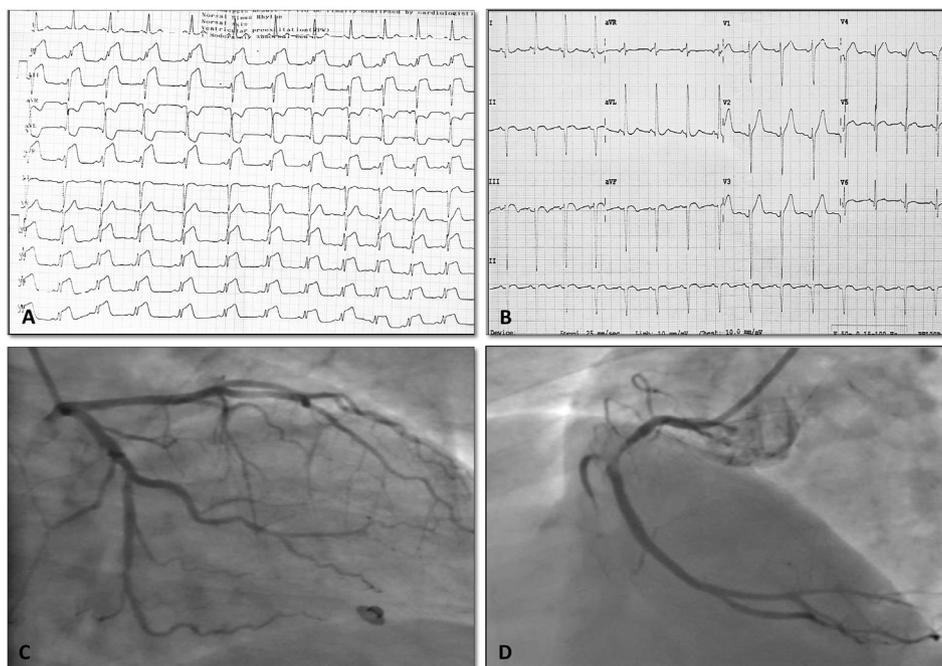


Fig. 1. Panel A: 12 Lead ECG displaying the limb leads and the left precordial leads at presentation (1 mV = 10 mm, paper speed 25 mm/s). Panel B: 12 Lead ECG displaying the limb leads and the left precordial leads post revascularization (1 mV = 10 mm, paper speed 25 mm/s). Panel C: Coronary angiogram depicting no significant stenosis in the left coronary system. Panel D: Coronary angiogram depicting tight stenosis in the proximal dominant right coronary artery with slow flow in right ventricular branch and with a large posterolateral branch.

Drafting of manuscript, Revising and editing the manuscript critically for important intellectual contents, Data preparation and presentation, Supervision of the research, Research coordination and management, Funding for the research.

Declaration of interest

There are no conflicts of interest.

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