

# A Patient with A Common Abnormal Electrocardiography but Showing An Uncommon Presentation During Coronary Angiography

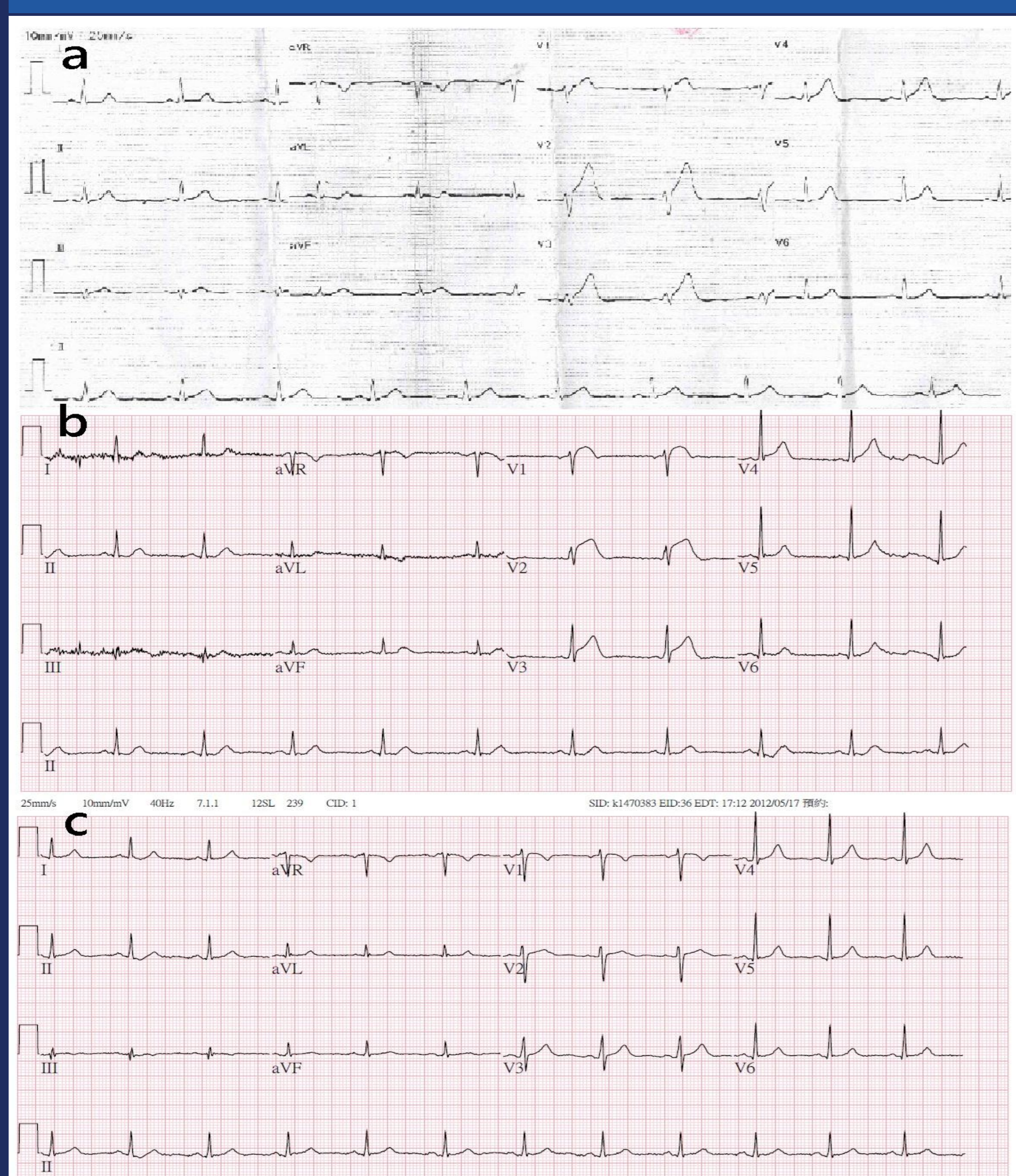
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## Case presentation

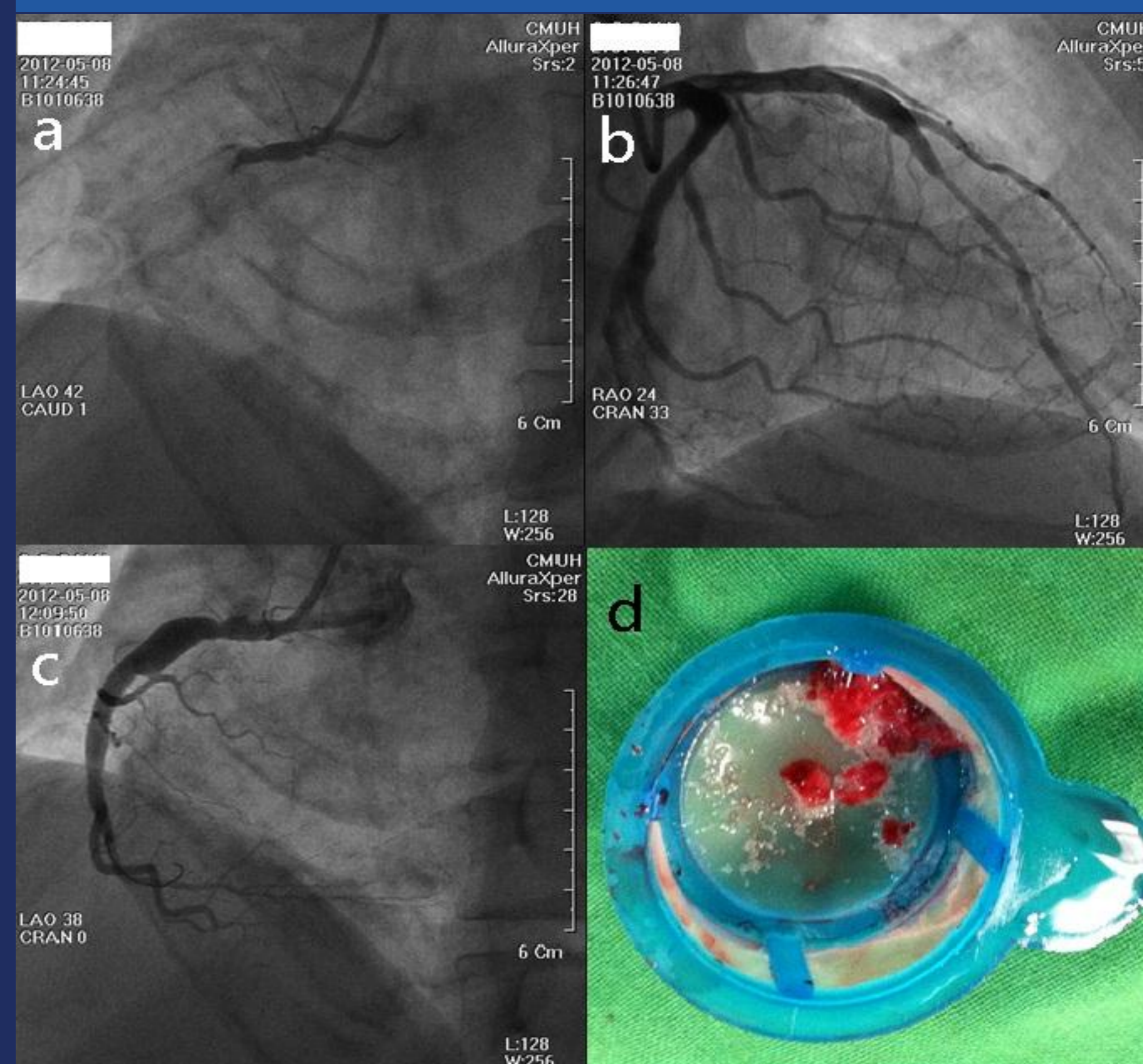
A 49-year-old previously healthy male smoker was referred to our hospital because of 2 hours of chest pain with cold sweating and breathlessness. The result of ECG performed in another hospital showed hyperacute T waves in leads V1-4 (Figure 1a). The ECG performed in our emergency department then demonstrated an acute anterior wall STEMI with a convex ST-segment elevation over leads V1-3 (Figure 1b). We decided to perform a primary intervention, and we administered a 600 mg loading dose of clopidogrel and 300 mg of aspirin after 4000 units of intravenous heparin. Coronary angiography results demonstrated left side dominant coronary arteries. Total occlusion of the proximal RCA with massive thrombus was observed (Figure 2). The LCA was remarkable for mid-50% segmental stenosis in the LAD. There was mild atherosclerosis of the LCX but 70% stenosis of the OM. Primary percutaneous transluminal coronary angioplasty of the occluded RCA was performed with repeated manual thrombus aspiration and subsequently a bare metal stent (3.0 × 18 mm) was deployed. Intracoronary tirofiban 25 µg/kg was also prescribed during the procedure. Restoration of thrombolysis in myocardial infarction (TIMI)-3 flow to the target vessel and grade 2 myocardial blush were obtained, with an acceptable angiographic result. A follow-up electrocardiogram showed complete resolution of the ST-segment elevation over the V1-V3 leads (Figure 1c). His peak troponin I level was 75.06 ng/mL. The results of echocardiography performed on the same day, after primary PCI, showed an ejection fraction of 53% without obvious regional wall motion abnormality. The patient was discharged uneventfully on the fourth hospital day. Because of the interesting and rare presentation of anterior ST-segment elevation with proximal occlusion of the RCA, we performed additional imaging studies. A thallium-201 scan 1 month later showed reversible perfusion in the inferoseptal wall and reverse redistribution in the anterior wall (Figure 3). A transthoracic strain echocardiography, performed the same day after PCI, was also analyzed (Figure 4). The final diagnosis was revised to acute inferior wall MI with suspicion of LAD spasm.

Figure 1



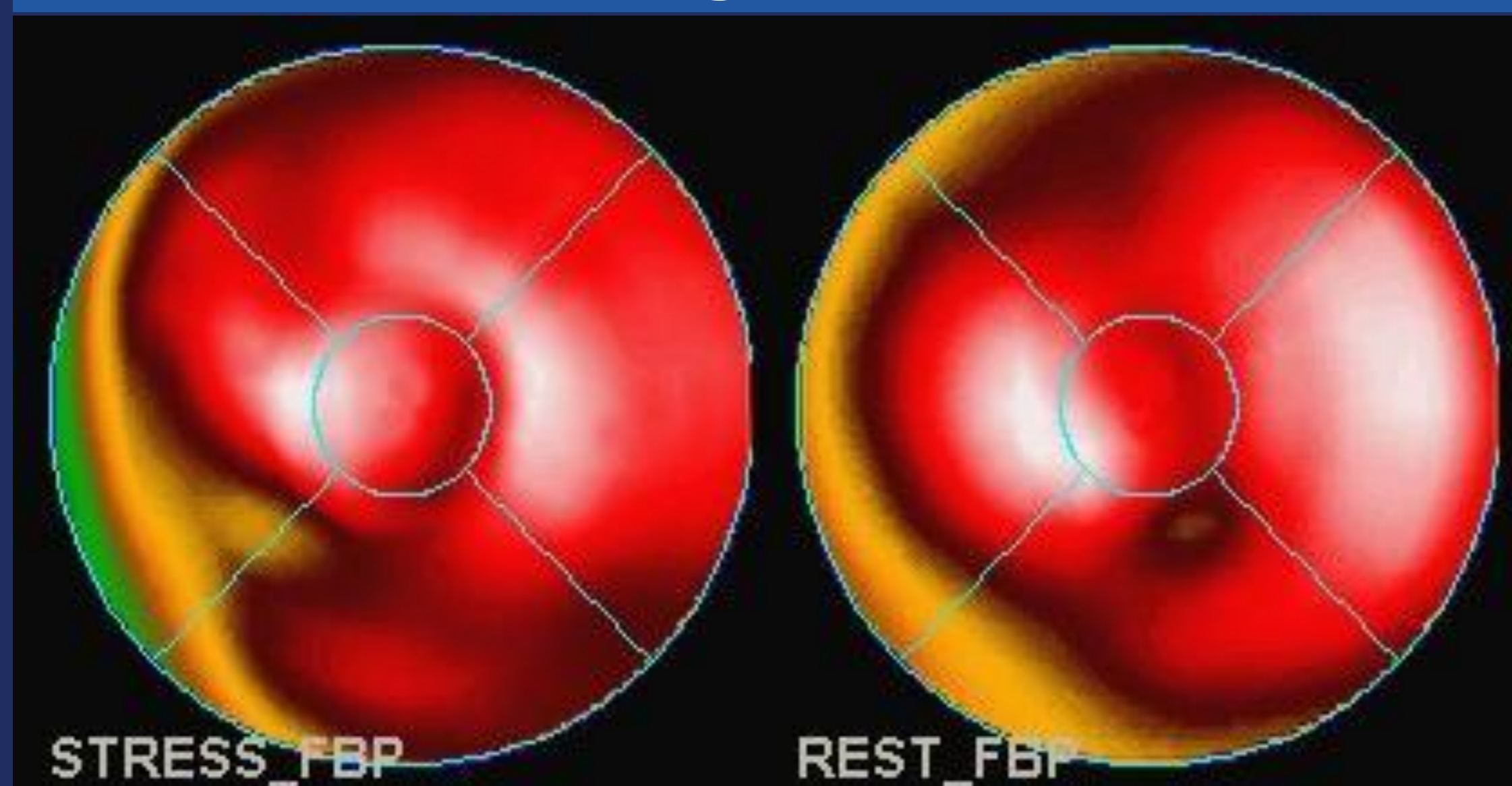
(a) The result of electrocardiography (ECG) performed in another hospital showed hyperacute T wave in leads V1-4. (b) The ECG results obtained at our emergency department then showed convex ST-segment elevation over leads V1-3. (c) A follow-up ECG after primary percutaneous coronary intervention showed complete resolution of ST-segment elevation over V1-V3 leads.

Figure 2



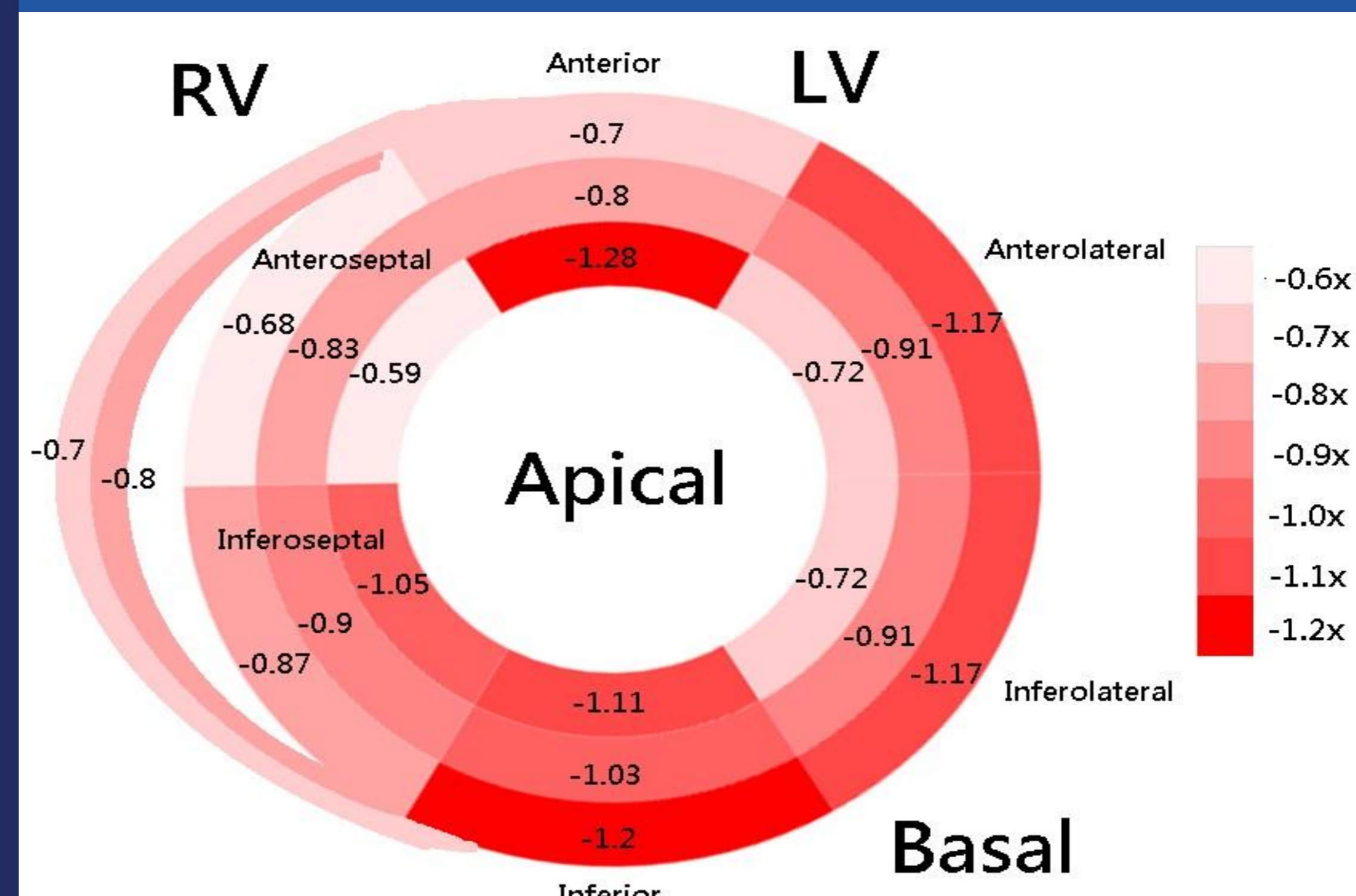
(a and b) Coronary angiography results showed total occlusion of the proximal right coronary artery (RCA) and mid-50% stenosis of the left anterior descending artery. There was mild atherosclerosis of the left circumflex artery but 70% stenosis of the obtuse marginal branch. (c) After percutaneous coronary intervention, coronary angiography showed restoration of the RCA with thrombolysis in myocardial infarction (TIMI)-3 flow and grade 2 myocardial blush. (d) Massive thrombus was obtained by repeated manual thrombus aspiration of the RCA.

Figure 3



The results of the Thallium 201 scan performed 1 month later showed reversible perfusion in the inferoseptal wall and reverse redistribution in the anterior wall.

Figure 4



Strain rate in our reported patient showed significant reduction in the anteroseptum and right ventricle and mild reduction in the anterior and inferoseptal areas.

## Conclusion

Serial imaging studies precluded counterclockwise rotation of the heart. The RCA's RV branch was not long enough to reach the anterior wall. The thallium scan did not support the existence of a subendocardial microvascular network. Reduced strain rate area suggested deeply injured LAD and RCA territory which was not compatible with mid-50% stenotic LAD. The non-dominant RCA electrical effect may be neutralized by the reciprocal change of precordial ST-segment elevation. Putting all together, RCA infarction with LAD coronary spasm which "reopened" during PCI is the most likely. From this case, we found the mechanism to be other than what we expected on the basis of the patient's initial ECG and coronary angiogram results. We suggest that **careful evaluation of all cardiac components should be made whenever a mismatch is encountered between the ECG and coronary angiogram results.**