Electrocardiogram changes causing a diagnostic dilemma

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A 52-year-old, previously healthy man was brought to the emergency room following an episode of collapse. He denied chest pain, shortness of breath or palpitations. Apart from smoking, he did not have any other risk factors for venous thromboembolism or coronary artery disease. He had a heart rate of 96 beats/min, a blood pressure of 110/70 mmHg, a slightly elevated jugular venous pressure and an oxygen saturation of 98% on high-flow oxygen. Arterial blood gases showed a PO_2 of 55.4 mmHg and a PCO_2 of 33.5 mmHg.

His 12-lead electrocardiogram (ECG) (Figure 1) showed diffuse ST segment depression in the anterior, inferior and lateral leads with ST elevation in lead aVR.

In view of these ECG changes, an acute coronary event involving the left main stem or triple vessel coronary disease, and an acute pulmonary embolism were considered to be differential diagnoses.

Figure 1) A 12-lead electrocardiogram showing diffuse ST segment depression in the anterior, inferior and lateral leads with ST elevation in lead aVR

Bedside echocardiography revealed a grossly dilated and hypokinetic right ventricle, and the left ventricle was globally hypokinetic. The D-dimer level was elevated at 1261 ng/mL (reference range 0 ng/mL to 250 ng/mL) and the troponin T level was 0.27 ng/L (reference range 0 ng/mL to 0.1 ng/mL).

A computed tomography pulmonary angiogram showed a large saddle thrombus in the right main pulmonary artery. There was also evidence of thrombus in the left upper and lower lobe branches.

In view of the large embolus, right ventricular dilation and syncope, the patient received thrombolytic therapy. ST changes resolved (Figure 2), and right and left ventricular function improved remarkably over the next few days.

The above ECG changes and echocardiographic features are indicative of severe right ventricular strain and myocardial ischemia due to acute massive pulmonary embolism.

Figure 2) A 12-lead electrocardiogram performed after thrombolytic therapy, showing resolution of ST changes

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Received for publication January 23, 2008. Accepted June 20, 2008