ECG DILEMMA

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Received: 08/26/2018 Accepted: 11/07/2018 Published: 12/7/18

Am J Hosp Med 2018 Oct;2(4):2018.027 https://doi.org/10.24150/ajhm/2018.027

A 55-year-old female with a history of type 2 diabetes was admitted for chest pain and was diagnosed with Non-ST segment elevation myocardial infarction (NSTEMI). An electrocardiogram (ECG) performed at the time of admission is shown below (Image 1). She subsequently underwent a percutaneous coronary intervention (PCI) to the proximal left anterior descending artery (LAD). Two hours later on the inpatient floor, her chest pain recurred, and a 12 lead ECG was repeated (image 2). What is the most likely cause of her recurrent chest pain?

1. Post-infarction pericarditis
2. Acute stent thrombosis
3. Acute pulmonary embolism
4. Non-cardiac chest pain

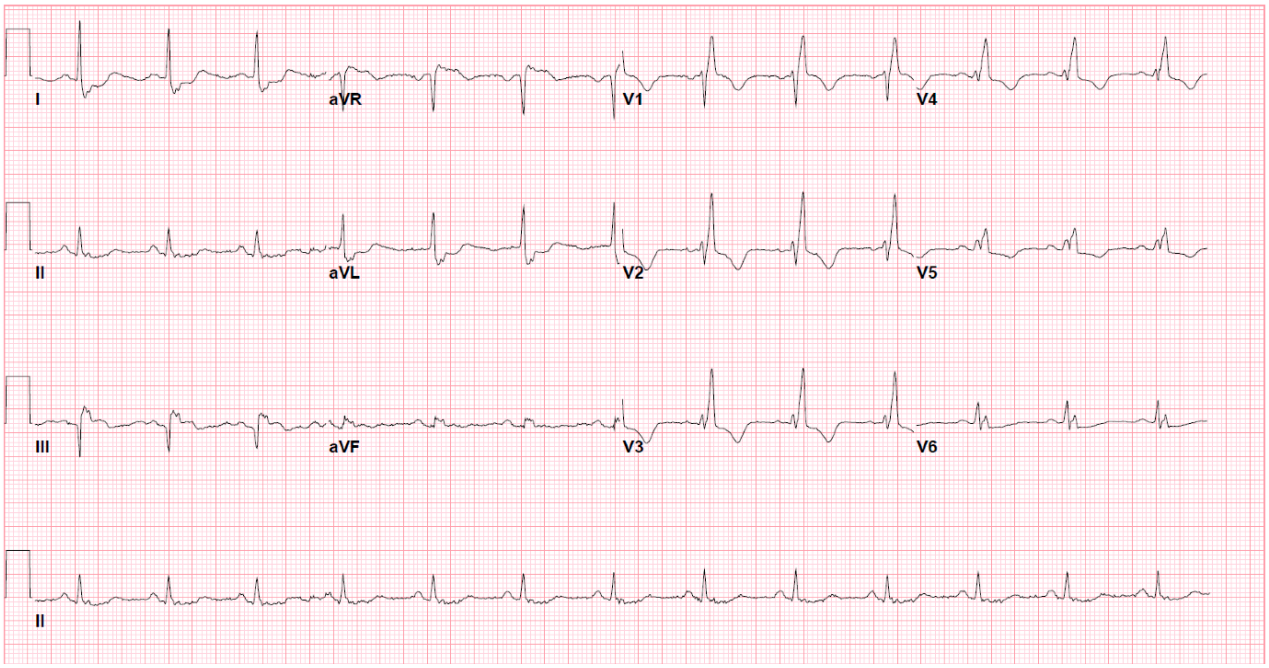

Image 1. 12-lead electrocardiogram at admission

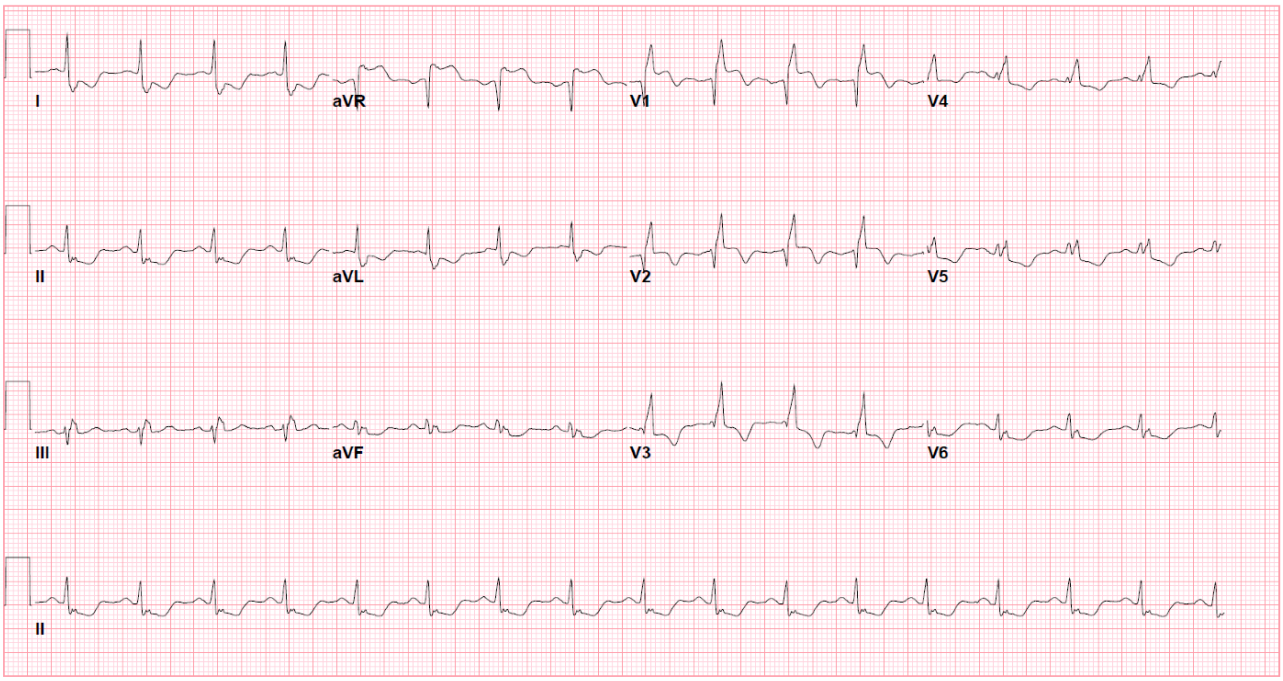

Image 2. 12-lead electrocardiogram obtained after percutaneous coronary intervention (PCI)

See the answer on the next page.

ANSWER

2. Acute stent thrombosis

The patient's baseline ECG shows sinus rhythm with a right bundle branch block (RBBB). There are secondary repolarization changes due to RBBB in the precordial leads. The ECG in Image 2 shows ST segment elevation in V1 and V2 with RBBB in addition to a "q" wave. The presence of "qRBBB" and ST segment elevation is indicative of proximal LAD occlusion causing an ST segment elevation myocardial infarction (STEMI). Compared to the presence of left bundle branch block, where-in specific criteria are needed to diagnose STEMI, the presence of RBBB does not interfere with the diagnosis of ST segment elevation myocardial infarction (STEMI). It is important to recognize ST elevation in the presence of a RBBB. She underwent an emergent coronary angiogram and the proximal LAD stent was found to be occluded. Balloon angioplasty was performed with successful restoration of flow. Post-infarction pericarditis also can cause ST segment elevation but is seen in multiple leads in the ECG and often seen after STEMI (transmural infarction). Acute pulmonary embolism can rarely cause ST segment elevation in precordial leads due right ventricular (RV) ischemia. However, the clinical setting in this case favors coronary ischemia. Non-cardiac chest pain should only be diagnosed after ruling out other etiologies.

References:

1. Engelen DJ, Gorgels AP, Cheriex EC, et al. Value of the electrocardiogram in localizing the occlusion site in the left anterior descending coronary artery in acute anterior myocardial infarction. J Am Coll Cardiol 1999;34:389-395
2. Zimetbaum PJ, Josephson ME. Use of the electrocardiogram in acute myocardial infarction. N Engl J Med. 2003 Mar 6;348(10):933-40