Focus on ECGs: Case #18

ST-Segment Elevation Soon after Coronary Artery Bypass Grafting

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A 59-year-old woman with hypertension, hyperlipidemia, and gastroesophageal reflux reported exertional angina that resolved with rest and nitroglycerin. Nuclear stress test results revealed a small, reversible inferior-wall defect and a left ventricular ejection fraction (LVEF) of 0.67. A coronary angiogram showed diffuse 3-vessel disease. The patient underwent elective 4-vessel coronary artery bypass grafting (CABG) with no complications and was extubated the next day. On postoperative day 2, a routine electrocardiogram (ECG) showed an rSr′ pattern in leads V_1 and V_2, and ST-segment elevation (STE) in leads V_2 through V_4 (Fig. 1).

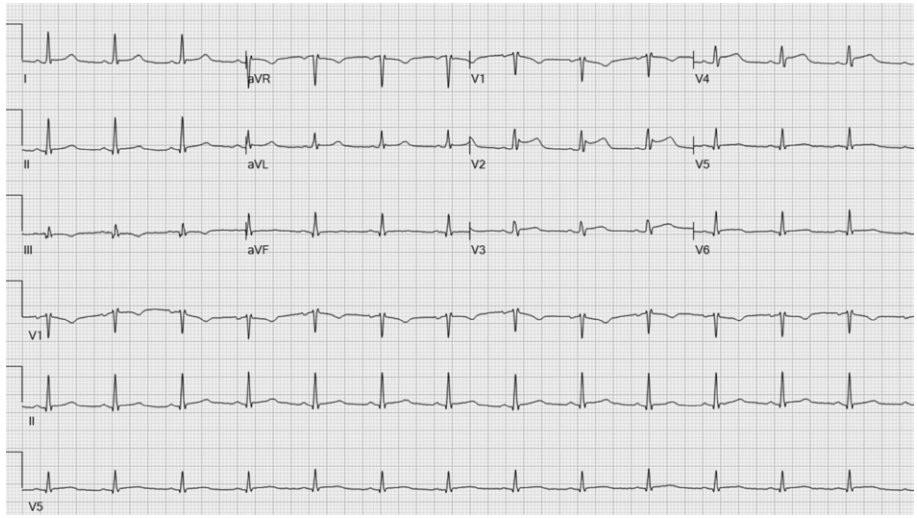

Fig. 1

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The patient reported no chest pain or dyspnea and had no murmurs, gallops, or rubs. A bedside echocardiogram showed preserved LVEF and no wall-motion abnormalities. Her initial troponin I level of 29.74 ng/mL decreased to 19.05 ng/mL 12 hours later.

The ECG shows which of the following?

A) Brugada phenocopy
B) Brugada type 2 pattern
C) Pericarditis
D) Acute anterior STE myocardial infarction (STEMI)

See next page for the answer, as well as a link to the Focus on ECGs *blog, where you can participate in a moderated discussion.*

Focus on ECGs: Answer #18

Answer

***C)* Pericarditis.**

The ECG shows concave STE in leads V_2 through V_4, and mild reciprocal ST-segment depression and PR elevation in lead aVR (Fig. 2), probably signifying postsurgical pericarditis.

Fig. 2

Brugada ECG patterns are classified as type 1 (a coved STE pattern >2 mm in leads V_1 through V_3 followed by a negative T wave) and type 2 (a saddleback STE pattern >2 mm).[1] Either pattern can be seen in patients with Brugada phenocopy, a phenomenon in which a true congenital Brugada syndrome is not present. The diagnostic criteria for Brugada phenocopy include the following[2,3]: a type 1 or 2 Brugada pattern and a medical condition to explain it, resolution of that pattern when the underlying condition resolves, no symptoms (such as syncope), no family history suggesting Brugada syndrome, and negative provocative testing with a sodium-channel blocker.

Although our patient had saddleback STEs in lead V_2, her clinical presentation was more consistent with pericarditis. In addition, rSr′ patterns in Brugada type 2 indicate different phenomena. Benign patterns, typically when the initial r wave is taller than r′, occur in athletes, pectus excavatum, or partial right bundle branch block, and after higher chest-lead placement of electrodes V_1 and V_2. In pathologic rSr′ patterns (as in right ventricular enlargement or arrhythmogenic dysplasia, Wolff-Parkinson-White syndrome, or hyperkalemia), r′ tends to be taller than r.[4] Furthermore, the β angle (which the r′ wave makes with the ST segment) can be used to diagnose type 2 Brugada syndrome by measuring the duration of the base of the triangle of r′ at 5 mm from the high takeoff. A β angle >3.5 mm suggests type 2 Brugada syndrome,[1] and our patient's pattern did not meet this criterion.

Acute STEMI was excluded: the patient was hemodynamically stable without chest pain and had preserved LVEF, normal wall motion, and decreasing troponin I levels (their elevation was probably secondary to recent CABG). Before her discharge from the hospital, the ST changes in the anterior leads resolved (Fig. 3).

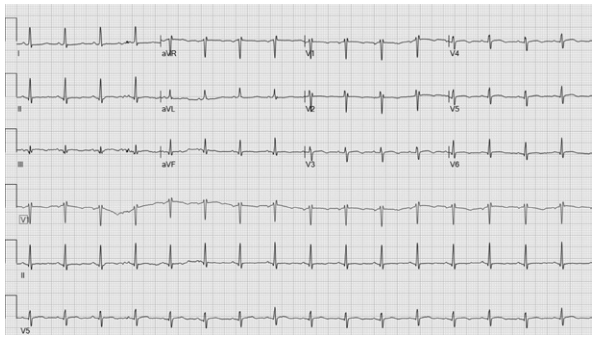

Fig. 3

References

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