

Visual Diagnosis in Emergency Medicine



GRAVEYARD ELECTROCARDIOGRAM

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INTRODUCTION

Total left main coronary artery occlusion is an unusual presentation of acute coronary syndrome leading rapidly to cardiogenic shock and death. Patients usually die prior to getting medical assistance and having an electrocardiogram (ECG) registered. Therefore, the electrocardiographic patterns associated with this lesion are not well described. We present a particularly representative and striking case of this fearsome situation.

CASE REPORT

A 65-year-old man with no previous cardiovascular history presented with chest pain that started while he was gambling. He took a taxi to the hospital and arrived 30 min after pain onset. On admission, he was alert though hypotensive (60/40 mm Hg), and showing signs of peripheral hypoperfusion (lightheadedness, pallor, clammy skin, “livedo reticularis”, delayed capillary refill, and diaphoresis).

The initial 12-lead ECG (Figure 1) showed tombstoning ST elevation (i.e., convex elevation engulfing the T wave) in leads V1 through V5, I, and aVL, an important ST-segment depression in inferior leads, right bundle branch block, and left anterior fascicular block. The

patient was immediately taken for emergency coronary angiography that revealed total thrombotic occlusion of the left main coronary artery (Figure 2). He was successfully treated with thrombus aspiration and drug-eluting stent implantation, restoring coronary flow and resolving the ECG pattern. During the procedure the patient suffered hemodynamic collapse, several episodes of ventricular fibrillation, and pulseless ventricular tachycardia, resolved with electrical shocks. Hemodynamic support was provided by norepinephrine perfusion and intra-aortic balloon counterpulsation. Beyond the acute episode, the patient had a long recovery with several respiratory and infectious complications. He was discharged free of neurologic sequelae, an almost-normal ECG, and moderately depressed left ventricular ejection fraction (40–45%).

DISCUSSION

Acute occlusion of the left main coronary artery (ULMCA) is often lethal prior to arrival to a hospital. Several electrocardiographic patterns have been described suggesting acute ULMCA lesion, all in small series. It has been concluded that total occlusion of ULMCA must be suspected in ECG pattern of left anterior descending coronary artery occlusion

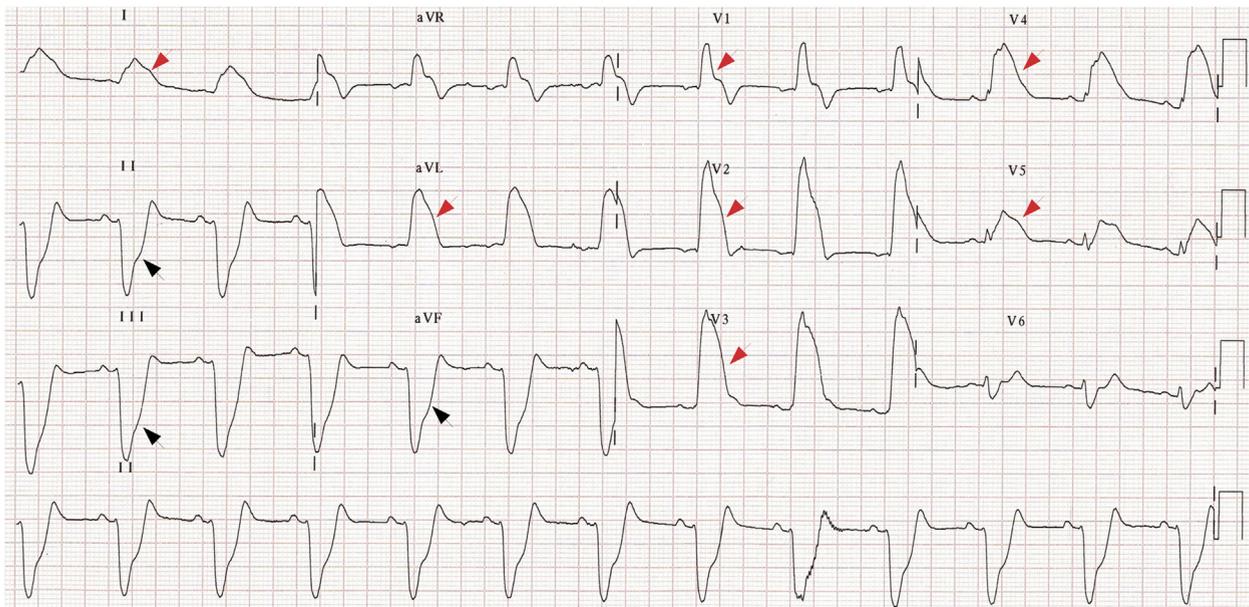


Figure 1. Admission electrocardiogram demonstrates tombstoning ST elevation in leads V1 through V5, I, and aVL (red arrows), and ST-segment depression in inferior leads (black arrows), right bundle branch block, and left anterior fascicular block.

proximal to first septal and first diagonal without ST-segment elevation in V1 and aVR due to left circumflex coronary artery compromise. Right bundle branch block and left anterior fascicular block had also been



Figure 2. Angiography demonstrates acute total occlusion of the left main coronary artery (arrow).

described as frequent ECG patterns in this pathology (1,2).

Tombstoning ST elevation is a particular type of ST-segment elevation with a distinctive morphology that is seldom observed in the early period of acute occlusion of the left anterior descending artery (3). On the other hand, left main disease causes a change in the repolarization vector that is usually manifested by ST depression in inferior leads. This striking case shows both features, with a diffuse tombstoning ST pattern as well as deep, grave-like ST depressions, hence the “graveyard” appearance that may also be a reminder of the poor prognosis associated with a total occlusion of the left main stem.

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