

Case Report

# Double coronary artery thrombosis presenting as acute extensive anterior ST-segment elevation myocardial infarction

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## Abstract

Simultaneous thrombosis of more than one coronary artery is an uncommon angiographic finding in acute ST-segment elevation myocardial infarction (STEMI), and usually leads to cardiogenic shock or even sudden cardiac death. We reported a 56-year-old man presenting with persistent chest tightness and ST-segment elevation over precordial leads in electrocardiography (ECG). Emergent coronary angiogram showed total occlusion of both the proximal right coronary artery (RCA) and the proximal left anterior descending artery (LAD). We performed thrombus aspiration and stenting over the LAD with thrombolysis in myocardial infarction (TIMI) III flow to the distal LAD. However, diminishing collateral flow to the distal RCA complicated with complete atrioventricular block (CAVB) and cardiogenic shock developed thereafter. Because distal embolization of the collateral circulation from the LAD to the distal RCA was suspected, thrombus aspiration and stenting over the proximal RCA were performed. After reperfusion of the RCA, the patient's hemodynamic status stabilized and he recovered uneventfully.

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## 1. Introduction

Acute myocardial infarction (AMI) is typically caused by disruption of atheromatous plaques, resulting in thrombus formation leading to partial or complete occlusion of the coronary artery. Multivessel coronary disease is relatively common in patients with ST-segment elevation myocardial infarction (STEMI), with a reported prevalence ranging from 50% to 80% in selective populations.<sup>1,2</sup> Although multiple ruptured plaques with thrombus formation have been reported in more than 10% of autopsied cases,<sup>3</sup> concomitant thrombosis and complete occlusion of two coronary arteries is still an uncommon finding in angiography. Most patients with acute multivessel thromboses are critically ill and may present with

cardiogenic shock or sudden cardiac death before arriving to the hospital. We report a case of double coronary artery thrombosis that was successfully treated with thrombus aspiration and stenting.

## 2. Case report

A 56-year-old man presented to the emergency room with persistent severe retrosternal chest tightness and cold sweating for 1 day. Upon arrival, his vital signs showed a regular heart rate of 96 beats/minute, blood pressure of 117/89 mmHg, and mild respiratory distress with a respiratory rate of 24 breaths/minute. Physical examination showed decreased S1 intensity, Grade II/VI systolic murmurs over the left lower sternal border, and fine rales over the bilateral basal lung field on auscultation. The electrocardiography (ECG) on arrival showed sinus rhythm, a QS pattern, ST-segment elevation in lead V1–5, and Q wave in leads II, III, and aVF (lead augmented vector foot) (Fig. 1A). Chest radiography revealed

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Fig. 1. (A) Twelve-lead electrocardiography (ECG) on arrival to the emergency room showed a QS pattern and ST-segment elevation in V1–4 and Q wave in leads II, III, and aVF (lead augmented vector foot). (B) ECG tracing after successful coronary stenting of the left anterior descending coronary artery (LAD) showed complete atrioventricular block (CAVB).

cardiomegaly and mild cephalization of pulmonary vasculature. Laboratory studies revealed a white cell count of  $12.4 \times 10^9/L$ , hemoglobin concentration of 137 g/L, platelet count of  $221 \times 10^9/L$ , creatine kinase (CK) of 3272 U/L, CK-MB of 481 U/L, and troponin-I 107.4  $\mu\text{g/L}$ . Other study results were unremarkable.

The patient's medical history revealed that he smoked one pack of cigarettes per day and was a social drinker. There was no past history of other systemic illnesses or family history of premature coronary artery disease. He mentioned an episode 2 years earlier of severe chest tightness, which subsided spontaneously without any medical management.

Prior to emergent coronary angiography, the patient was preloaded with dual antiplatelet therapy. It showed total occlusion with suspected thrombus formation of both the left anterior descending coronary artery (LAD) and the proximal right coronary artery (RCA), with collateral flow from the distal part of the left circumflex coronary artery (LCX) and LAD to the distal RCA and posteriolateral (PL) branch (Fig. 2A–C). Left ventriculography revealed an ejection fraction of 28% with a sizeable apical aneurysm, and

dyskinesia over the anterior and inferior walls of the left ventricle. After engaging the left main coronary artery by use of a guiding catheter, transient ventricular fibrillation developed and subsided after five defibrillations. A Fetch Aspiration Catheter (Medrad Inc., Warrendale, PA, USA) was used for thrombus aspiration and several small pieces of red thrombus were aspirated. Then, an intracoronary loading dose of Tirofiban (Irokocardio international SARL, Geneva) was administered according to the patient's body weight. The thrombolysis in myocardial infarction (TIMI) flow of the LAD improved from 0 to II. After balloon dilatation, a Cypher (Cordis Corporation, Miami Lakes, FL, USA) 2.5 mm  $\times$  33 mm drug-eluting stent was deployed over the middle to distal part of the LAD, and another Cypher 3.0 mm  $\times$  28 mm stent over the proximal to middle part of the LAD. After the stenting procedure was completed, coronary flow over the LAD improved to TIMI III with good coronary brushing (Fig. 2D,E). However, bradycardia with complete atrioventricular block (CAVB) and hypotension developed progressively and a temporary pacemaker was placed. In addition, collateral flow from the LCX and the

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