Simultaneous Multi-Vessel Coronary Thrombosis Resolved with Rescue Angioplasty

Simultaneous multi-vessel coronary thrombosis is a poorly described entity of ST-segment elevation myocardial infarction (STEMI); consequently, clinical presentation, therapeutic approach and prognosis are not clearly known. Published case reports often describe critically ill patients with electrical and/or hemodynamic instability, most of whom were appropriately revascularized through percutaneous coronary angioplasty showing a low in-hospital mortality. We report the case of a patient with simultaneous thrombosis of the left anterior descending coronary artery and right coronary artery that was opportunistically treated at our hospital.

Simultaneous multi-vessel coronary thrombosis is defined as STEMI associated with direct angiographic visualization of two or more thrombi causing partial or complete occlusion of at least two major epicardial coronary arteries. (1) Little is known about its clinical presentation and therapeutic management. Two systematic reviews published in 2009 and 2015 included a population of 47 and 56 patients with unidentifiable etiology of simultaneous multi-vessel coronary thrombosis, which means the population whose myocardial infarction was caused by coronary atherosclerotic plaque rupture but not by other secondary causes. Electrical and hemodynamic instability was the most common clinical presentation, however, there was low percentage of in-hospital mortality. (1, 2)

We describe the case of a 68-year-old man with a history of smoking and type 2 diabetes mellitus, without any other personal or family history of diseases, who presented at the emergency department with one hour episode of chest pain, dyspnea and diaphoresis. On examination, the heart rate was 40 beats per minute (bpm) with mean arterial pressure of 70 mmHg. He was anxious and showed bradycardia with normal breath sounds on auscultation; the rest of the examination was normal. Initial electrocardiogram (ECG) revealed subepicardial lesion of the anterior and inferior wall with right ventricular (RV) involvement (Figure 1). Treatment with aspirin 300 mg, clopidogrel 300 mg, enoxaparin 30 mg and a weight adjusted single bolus of tenecteplase within the first 15 minutes of the diagnosis of myocardial infarction was administered. However, the patient developed cardiogenic shock and the electrocardiogram did not show any reperfusion criteria after 60 minutes of thrombolysis. At that moment, STEMI risk scores were GRACE 181 points (40% probability of death from admission to 6 months) and TIMI 9 points (35.9% risk of all-cause mortality at 30 days). Therefore, the patient was transferred to the cardiac catheterization laboratory to undergo a rescue angioplasty supported by norepinephrine and dobutamine. First, a pacemaker electrode was placed in the right ventricle through the femoral vein and was programmed in VVI mode at 70 bpm; coronary angiography showed intraluminal thrombus and 70% stenosis in the proximal segment of the right coronary artery (RCA) with TIMI 2 flow. Simultaneously, the left anterior descending artery (LAD) showed intraluminal thrombus and 80% stenosis in the mid-segment with TIMI 2 flow. Everolimus-eluting stent (Xience-Alpine: 4.0 × 28 mm) was implanted in the RCA and two everolimus-eluting stents (Xience-Alpine: 3.5 x 18 mm and 4.0 x 18 mm) were implanted in the LAD with stent overlap. The final angiography showed both arteries with TIMI 3 flow (Figure 2). Subsequently, the ECG showed normal sinus rhythm and markers of reperfusion with normalization of ST-segment and T wave inversions in the affected leads. The echocardiogram revealed RV dyskinesia with fractional area change of 22% and left ventricular ejection fraction of 46%. The inotropic support and the vasopressor were withdrawn in less than 48 hours. Finally, after cardiac in-hospital rehabilitation, he was discharged 8 days later with medical follow-up in the outpatient cardiology clinic. In the last cardiology consultation, six months after the event, the patient denies cardiovascular symptoms in his daily activities or during the aerobic exercises, so his condition has a functional class I, according to the New York Heart Association.

Obstructive coronary artery disease in other epicardial arteries unrelated to STEMI is a common finding and has been found approximately in 52.8% of cases. (3) However, simultaneous multi-vessel coronary thrombosis is a rare entity of STEMI, which has been reported in 1.7% to 4.8% of cases. (2) The specific trigger of this condition remains unclear, but a theory suggests that inflammatory pathophysiological processes exert adverse effects throughout the coronary arteries.
vasculature and therefore result in multiple unstable lesions with multi-vessel thrombosis. (4) In two systematic reviews, the most frequent clinical presentation was cardiogenic shock (36% to 41%), followed by ventricular arrhythmias (23% to 25%). The ECG generally reveals ST-segment elevation in leads of a single wall affected, and less frequently in leads of all the walls involved. On the other hand, the therapeutic approach in most of these patients has consisted of percutaneous coronary intervention in up to 91% of the cases. Despite the severity of the clinical presentation, in-hospital mortality has varied from 1% to 5% of cases. (1, 2) There is a discrepancy between the severity of the clinical presentation and inpatient mortality, as the presence of cardiogenic shock during STEMI carries a risk of in-hospital mortality greater than 60%. (5) This may be due to the fact that many cases of patients dying from simultaneous multi-vessel coronary thrombosis have not been published, (1) or many of them develop with sudden death before a coronary angiography procedure. (2)

In conclusion, this particular case had a favorable evolution despite the severity of the clinical presentation with similar outcome to other case reports of simultaneous multi-vessel coronary thrombosis who were opportunistically revascularized.

Conflicts of interest
None declared.
(See authors’ conflicts of interest forms on the website/Supplementary material).

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REFERENCES