Concomitant Anterior and Inferior Myocardial Infarctions

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Int J Angiol 2015;24:59–62.

Abstract

Keywords

- myocardial infarction
- stent
- angioplasty

Acute multicoronary occlusion is an extremely rare clinical and angiographic finding. Prompt diagnosis and treatment are extremely important. Herein, we present a 38-year-old man suffering from concomitant anterior and inferior myocardial infarctions due to simultaneous total occlusion of both the left anterior descending and right coronary arteries.

Acute multicoronary occlusion (AMCO) is an extremely rare clinical and angiographic finding that frequently presents with cardiogenic shock.¹ Prompt diagnosis and treatment of this situation are extremely important.

Herein, we present a 38-year-old man suffering from concomitant anterior and inferior myocardial infarctions due to simultaneous total occlusion of both the left anterior descending (LAD) and right coronary arteries (RCA).

Case Presentation

A 38-year-old man presented with chest pain for 3 hours. His only risk factor for coronary artery disease was a family history. His blood pressure was 85/55 mm Hg, and his heart rate was 120 beats per minute. Electrocardiography (ECG) showed ST elevation in all derivations excluding the D1 and aVL (►Fig. 1). Coronary angiography revealed acute total occlusion of both the LAD and RCA (►Fig. 2A, B). Aspirin, tirofiban, and clopidogrel (600 mg) were administered. After manual thrombus aspiration of both coronary arteries, direct stenting of both the LAD and RCA was performed; good thrombolysis in myocardial infarction III flow in both coronary arteries was achieved (►Fig. 2C, D). His hemodynamic status immediately improved after stenting. The postprocedure ECG showed 1 to 2 mm ST elevation and QS wave in the anterior leads and Q waves in the D3 and aVF (►Fig. 3).

Tirofiban was administered for 24 hours. Metoprolol and ramipril were started the day after his admission. The peak creatine kinase muscle and brain were seen in 24 hours of admission and was 416 unit. Echocardiography showed severe hypokinesis involving anterior, apex, anterior, septal, and lateral walls, and the left ventricular ejection fraction was measured, 34%. He was discharged home on the fifth day on aspirin, clopidogrel, metoprolol, atorvastatin, and ramipril.

Discussion

AMCO is an extremely rare situation, and less than 50 cases have been reported.^{1,2} Nevertheless, the ECGs of some of reported cases were not reliable, and the occlusion of the coronary arteries may have been chronic rather than acute. However, the incidence of AMCO in an autopsy series was reported as up to 50% of patients.³ The discrepancy appears to relate to the fatal course of AMCO; many patients do not survive long enough to undergo angiography.^{1,3}

Even though the exact mechanism is unknown, multiple plaque ruptures in multiple coronary arteries is the most common cause.² Another possible explanation is thrombosis due to hemodynamic instability caused by one coronary occlusion.^{1,2} Nevertheless, aortic or mitral valve endocarditis, increased inflammatory response and catecholamine secretion due to acute occlusion of one coronary artery,

Fig. 1 Preprocedure electrocardiography showing ST elevation in the anterior and inferior leads.

coronary embolism, hypercoagulability because of systemic thrombocytosis or malignancy, and suspected coronary spasm have all been linked to AMCO.² Our patient had atherosclerosis in all coronary arteries and hypotension at

admission. Therefore, either simultaneous plaque rupture in both coronary arteries or hypotension after occlusion of either the LAD or RCA may have led to thrombosis in the other coronary artery.

Fig. 2 (A) Total occlusion of the right coronary artery (arrow 1) and the antegrade collaterals going to the distal right coronary artery (arrow 2). (B) Total occlusion of the left anterior descending artery. (C) The right coronary artery after stenting. (D) The left anterior descending artery after stenting.

Fig. 3 Postprocedure electrocardiography showed 1 to 2 mm ST elevation and QS wave in anterior leads and Q waves in the D3 and aVF.

The most common ECG finding in the previously reported cases was ST elevation in the inferior and anterior leads; however, although not particularly common, even hyperacute T waves can be observed on ECG.² In our case, ST elevation was also present in both the inferior and anterior leads.

AMCO always leads to very serious illness, and cardiogenic shock is the most common presentation; prompt restoration of flow is critical.^{1,2} Total occlusion of multiple coronary arteries⁴ or occlusion of one artery and thrombus in other arteries can be observed in AMCO.⁵ Although AMCO can be observed in any combination of coronary arteries, the LAD and RCA are the most commonly affected.² Patients with AMCO have been treated with thrombolysis, stenting, or both.⁶ Our patient was treated with two stents implanted in the LAD and RCA after thrombus aspiration. We did not have sufficient time to place an intra-aortic balloon pump (IABP) for counterpulsation before angiography due to the severe hemodynamic impairment. First, we performed stenting in the RCA followed by the LAD. The hemodynamic status of the patient recovered quickly after stenting the RCA and LAD, and an IABP was not inserted.

Despite his unstable presentation and large extent of myocardial damage, our patient survived to hospital discharge.

In summary, combined myocardial infarction caused by the simultaneous acute occlusion of two coronary arteries is extremely rare in living individuals who are taken to a catheter laboratory and is usually associated with poor outcome. Individuals with ST elevations in all leads should be

carefully monitored. In addition, opening the affected vessels expeditiously will maintain hemodynamic stability, help to save the myocardium and cardiac functions, and improve the prognosis.

Conflict of interest

The authors have no conflicts of interest to disclose.

References

- 1 Kanei Y, Janardhanan R, Fox JT, Gowda RM. Multivessel coronary artery thrombosis. *J Invasive Cardiol* 2009;21(2):66–68
- 2 Pollak PM, Parikh SV, Kizilgul M, Keeley EC. Multiple culprit arteries in patients with ST segment elevation myocardial infarction referred for primary percutaneous coronary intervention. *Am J Cardiol* 2009;104(5):619–623
- 3 Burke A, Virmani R. Significance of multiple coronary artery thrombi. A consequence of diffuse atherosclerotic disease? *Ital Heart J* 2000;1(12):832–834
- 4 Hosokawa S, Hiasa Y, Miyamoto H, et al. Acute myocardial infarction showing total occlusion of right coronary artery and thrombus formation of left anterior descending artery. *Jpn Heart J* 2001;42(3):365–369
- 5 Derian W, Hertsberg A. Acute myocardial infarction from simultaneous total occlusion of the left circumflex and right coronary artery. A case report. *Int J Cardiol* 2007;119(2):e65–e67
- 6 Turgeman Y, Suleiman K, Atar S. Multivessel acute coronary thrombosis and occlusion—an unusual cause of cardiogenic shock. *J Invasive Cardiol* 2007;19(9):E278–E280