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Primary Percutaneous Coronary Intervention in the Left Main ST-Elevation Myocardial Infarction and Cardiogenic Shock on Octogenarian Patient with Single Remaining Vessel

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Abstract

The left main coronary artery (LMCA) ST-elevation myocardial infarction has been associated with significant morbidity and mortality. Older age and cardiogenic shock are independent predictors for in-hospital mortality. Here, we report a case of an 89-year-old Javanese man with a history of smoking presented with total LMCA occlusion complicated by cardiogenic shock in an octogenarian that was saved by stenting in thrombolysis in myocardial Infarction Flow III right coronary artery.

Introduction

The left main coronary artery (LMCA) ST-elevation myocardial infarction has been associated with significant morbidity and mortality. The LMCA culprit lesions in acute coronary syndrome usually present with hemodynamic instability and cardiogenic shock [1]. Older age and cardiogenic shock are independent predictors for in-hospital mortality [2]. Octogenarian people with acute myocardial infarction (AMI) mostly get conservative strategy, although guideline may proceed to myocardial revascularization [3]. Here, we report a case of total LMCA occlusion complicated by cardiogenic shock in an octogenarian that was saved by stenting in thrombolysis in myocardial infarction Flow III right coronary artery (RCA). This case highlights a rare case of STEMI in a single remaining vessel.

Case Report

An 84-year-old Javanese man with a risk factor of smoking was referred to our emergency unit with STEMI on augmented vector right (aVR) Killip IV and new-onset RBBB. The patient complained of typical chest pain and had been treated for 8 days at the local hospital. However, the symptoms worsen and become persistent in day 9 of hospitalization. Patients had received 2.5 mg of subcutaneous fondaparinux for 5 days, 75 mg of clopidogrel, 2.5 mg of bisoprolol, 20 mg of atorvastatin, and 100 ng norepinephrine/min through continuous pump. On admission, the blood pressure was 97/64 mmHg with support of 100 ng norepinephrine/min continuous infusion, heart rate 104 beats/min (bpm), respiratory rate 24 times/min, and oxygen saturation of 96% with O_2 supplementation of 6 l/min on a simple mask.

Electrocardiogram showed sinus tachycardia, 104 bpm, and left axis deviation, with ST elevation in aVR and incomplete RBBB (Figure 1). Laboratory tests showed an increment of cardiac markers with CKMB of 23.7 U/L and troponin-I of 8.26 ng/ml. From transthoracal echocardiography, we found mild mitral, aortic, and mild tricuspid regurgitation without thrombus or vegetation. There was a decrease in systolic left ventricular (LV) function (EF Teich 41%), with diastolic LV function LV pseudonormal, and normal systolic RV function. There was hypokinetic in anteroseptal BM, inferoseptal BM, septal A, and

anterior BMA from LV segmental analysis. No LV hypertrophy was found.

Laboratories value	
Leukocytes	10,110
Hemoglobin	11.8
Platelets	145,000
Serum glutamic-oxaloacetic transaminase/serum glutamic pyruvic transaminase	43/29
Albumin	1.19
Creatinine	0.78
BUN	68
CK-MB	23.7
Blood sugar	213
Natrium	140
Kalium	4.3
Chloride	100
Troponin-I	8.26
Triglycerides /total cholesterol	75/129

Emergency coronary angiography was obtained and resulted in ostial left main chronic total occlusion (Figure 2). There was a significant stenosis (90%) in distal RCA (Figure 3) with Grade II collateral perfusion from RCA to LCA (Figure 4). We tried to open the culprit lesion at first. However, the guiding catheter failed to engage in the LCA. Based on those findings, an emergency bypass was planned for complete revascularization, and intra-aortic balloon pump (IABP) was implanted during the procedure due to hemodynamic instability (Figure 5). The patient case was then discussed within the heart team, and we decided to open up RCA, as it will simplify the complicated procedure.

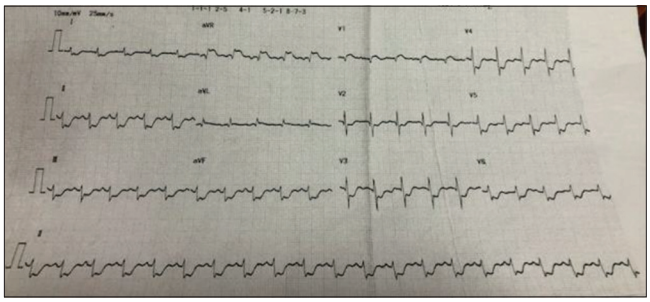

Figure 1: An electrocardiogram shows ST elevation in leads augmented vector right and ST depression in all

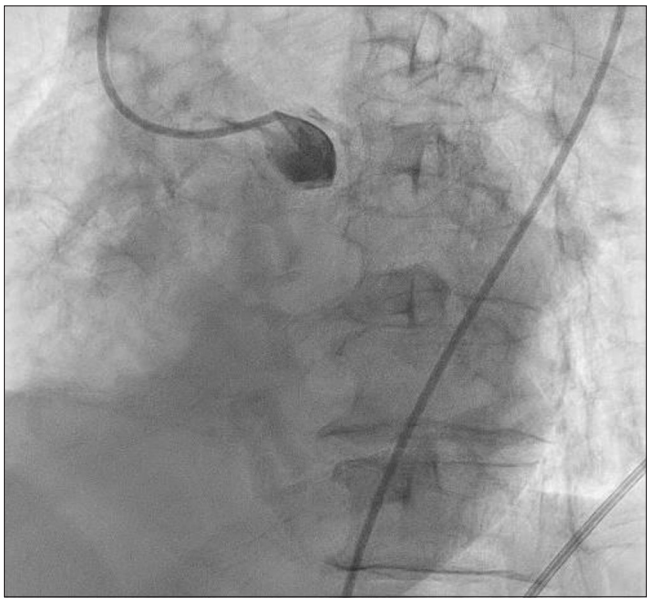

Figure 2: Coronary angiogram at the first attempt showed total occlusion in ostial left main coronary artery

Considering that the RCA was the single remaining vessel that perfused all part of the threatening myocardium, we execute quick direct stenting on the RCA. It was a pristine procedure followed by an immediate improvement in the patient's symptoms and hemodynamic. Within 24 h, IABP and vasoactive drugs were weaned. The patient was discharged 7 days after percutaneous coronary intervention (PCI) procedure with optimal medical therapy (100 mg of aspirin, 75 mg of clopidogrel, 40 mg of atorvastatin, 2.5 mg of bisoprolol, 5 mg of ramipril, 5 mg of isosorbide dinitrate, 40 mg of furosemide, and 25 mg of spironolactone).

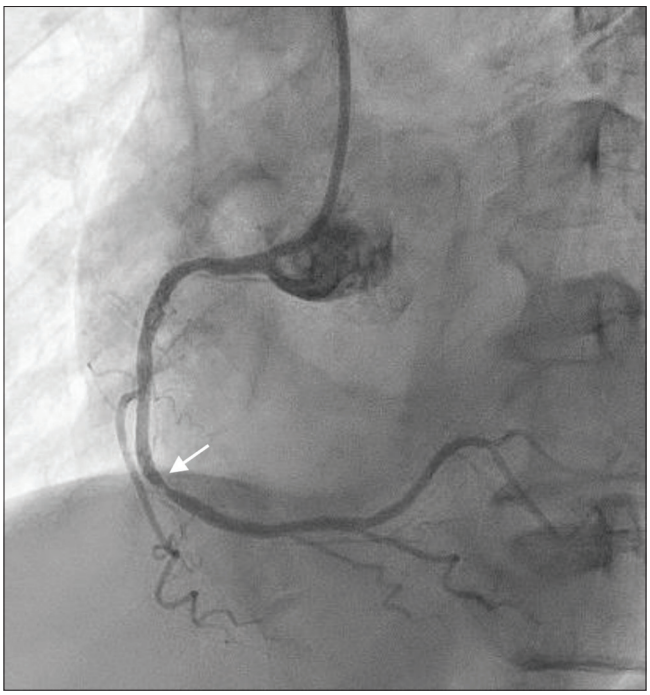

Figure 3: From the left anterior oblique view, there was critical stenosis 90% on distal right coronary artery (white arrow).

Figure 4. There was collateral from mid right coronary artery to distal left anterior descending

Discussion

The LMCA ST-elevation myocardial infarction has been associated with significant morbidity and mortality [1], due to circulatory failure and malignant tachyarrhythmia [4]. These patients' clinical picture is predominantly catastrophic compared to a more distal coronary artery occlusion, as they usually present with sudden cardiac death or profound cardiogenic shock [5]. On the other hand, the elderly become a negative prognostic factor of AMI survival and tend to be treated less aggressively compared to the young [6].

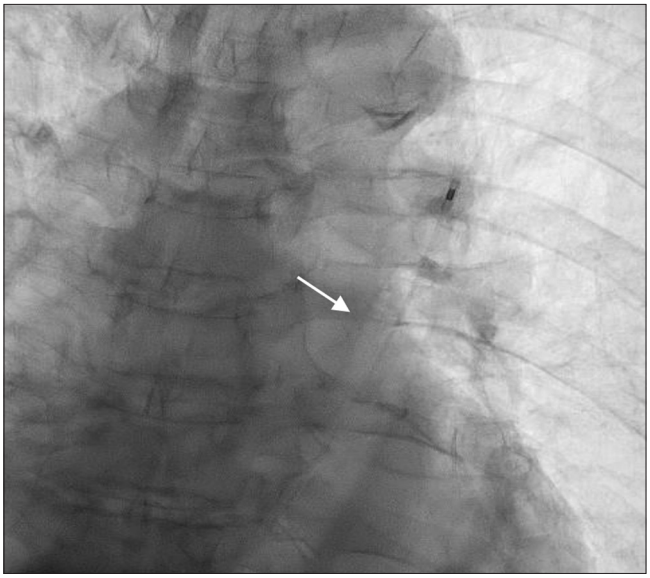

Figure 5. Intra-aortic balloon pump was inserted (white arrow)

Grygier *et al*. reported the left main occlusion in an 80-year-old woman. The patient also presenting with acute myocardial infarction complicated by cardiogenic shock due to the left main occlusion, then successful percutaneous intervention has been done to stabilize until bypass grafting was performed and resulted improvement of the patient [7].

We reported a case of an octogenarian patient diagnosed as a left main STEMI with clinical presentations of typical chest pain and cardiogenic shock. Emergency angiography was performed and revealed chronic total occlusion in ostial LMCA. There was a single remaining vessel RCA with significant stenosis (90%) on the distal and collateral Grade II from RCA to LCA. As a surrogate blood supply, the coronary collaterals rescue the myocardium jeopardized by abruptly occluded arteries, preventing myocardial necrosis and favoring recovery after revascularization [7]. This is a rare case of how a person can be survived by perfusion on a single remaining coronary artery through the collateral's blood flow.

In the first attempt, we failed to engage the left main culprit lesion and decided to plan coronary artery bypass grafting (CABG) for complete revascularization. During this procedure, we inserted IABP for hemodynamic support while waiting for the definitive treatment. Even though the evidence is limited regarding IABP's benefit, it should be considered as a rescue therapy to stabilize the patient and preserve organ oxygenation [8]. Regardless of CABG established as the standard management for stable LMCA disease, hesitancy encloses the optimal revascularization strategy for patients with STEMI and LMCA occlusion who survived to hospitalization, and treatment guidelines in this scenario are vague. PCI is technically feasible in most patients with myocardial infarction. It should be taken into account as a viable alternative to CABG for specific indications, including those with LMCA occlusion and cardiogenic shock, as witnessed in our patient [9]. For those reasons, we changed the plan and performed a second attempt PCI to open the single remaining artery, as the recent guideline recommends it, in the case of STEMI on cardiogenic shock [10]. After direct stenting in distal RCA, we found an augmentation of collateral blood flow and clinical improvement on patient symptoms and hemodynamic profile.

This is a rare case of an octogenarian patient with STEMI in the left main that was successfully saved by PCI on the non-infarct related, single remaining RCA. An aggressive approach is compulsory in life-threatening conditions, even in the elderly, as one life matters.

Conclusion

PCI can be a safe option in an elderly with single remaining vessel STEMI complicated by cardiogenic shock.

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