Multivessel disease in a patient taken to the catheter laboratory with acute myocardial infarction and cardiogenic shock

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Answer 3: Start revascularization with the distala LAD via LIMA

Although there were Q waves and minimal ST-segment elevations in DIII and AVF at the initial ECG, in the coronary angiogram, antegrade collateral flow in the right coronary artery (RCA) and an existing saphenous graft-even though it was occluded-to this vessel suggested that the native RCA lesion was old. Therefore, we did not consider starting revascularization with the native RCA first.

There was good antegrade collateral flow in the circumflex artery (Cx). This collateral flow was sufficient to provide distal vessel blood supply. Because of this adequate distal flow, we did not start revascularization with the Cx first.

Emergency coronary bypass operation in the setting of acute myocardial infarction carries a high mortality risk. In the case of cardiogenic shock, this mortality risk increases exponentially. Current guidelines suggest emergency surgery in this situation, if the coronary anatomy is not suitable for percutaneous intervention or a mechanical complication coexists. Accordingly, we wanted to try the percutaneous intervention option.

While the LAD was totally occluded, the LIMA injection showed good flow. However, the distal part of the LAD was not seen. Prominent flow of the LIMA graft suggested that the infarct-related artery could be the distal LAD. Existence of a LIMA graft suggested that the LAD lesion could be old. Additionally, the native LAD was occluded at the level of the ostium. We suggested attempting to pass a guidewire to the distal LAD via the LIMA graft rather than the native LAD.

In the SHOCK trial, it has been shown that early revascularization reduces long-term mortality in patients with acute myocardial infarction (AMI) presenting with cardiogenic shock (1). Current guidelines suggest trying to revascularate all of the suitable coronary vessels in the setting of AMI and cardiogenic shock (2, 3). Beyond procedural difficulties, starting revascularization with a chronic and non-infarct-related artery would be harmful. Therefore, choosing the right vessel in those patients is crucial. This decision may be challenging in patients with complex coronary anatomy. In our patient, the decision was made to perform intervention of the native LAD through to the LIMA. Upon passing the guidewire to the lesion, a balloon angioplasty was performed, and distal flow was seen. An impressive collateral network appeared throughout to the apical, inferior, and lateral walls after revascularization of the LAD (Fig. 3, Video 2). Immediately after, the patient's complaints were relieved, and the hemodynamic parameters were improved. ECG findings were recovered (Fig. 4). In our case, the presence of antegrade collateralization in the right coronary artery and circumflex artery, absence of collateralization of the distal LAD, and good flow of
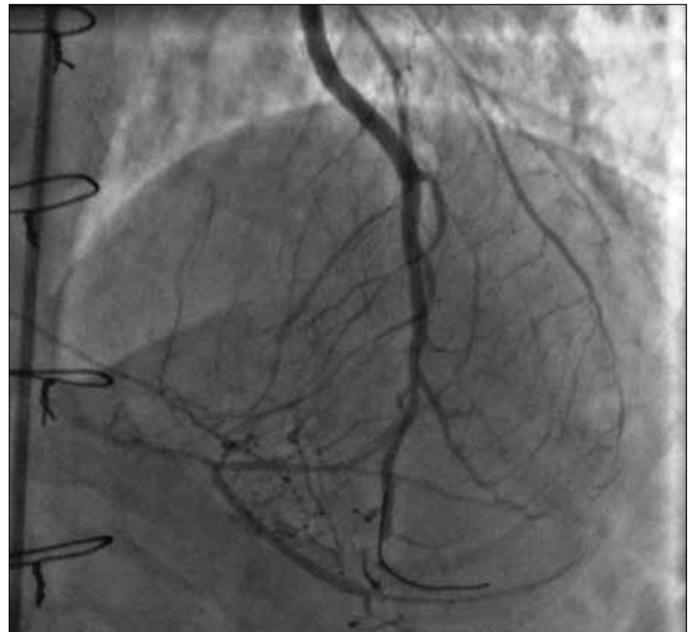

Figure 3. Distal LAD and collateral network after the revascularization
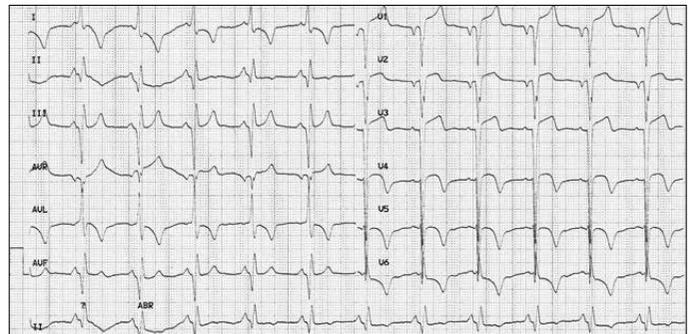
Figure 4. Electrocardiogram after the revascularization

the LIMA suggested that the LAD occlusion could be new. Although the lesion was at the distal part of the vessel, good collateralization salvaged a large amount of myocardial tissue.

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References

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2. ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. Eur Heart J 2012; 33: 2569-619. [CrossRef]
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Video 2. Distal LAD and collateral network after the revascularization