

New debate of revascularization strategy of non-infarct-related artery lesions in patients with ST-segment elevation myocardial infarction and cardiogenic shock: decoding the CULPRIT-SHOCK trial, not enough to challenge the current guidelines

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To the Editor: Research result of CULPRIT-SHOCK trial^[1] presented at the Transcatheter Cardiovascular Therapeutics (TCT) 2017 conference suggested that acute myocardial infarction (AMI) patients with multivessel disease (MVD) and cardiogenic shock undergoing primary percutaneous coronary interventions (PCI) treated with culprit-only revascularization (COR) strategy had lower mortality at one month compared with immediate complete revascularization in single procedure (CRS) strategy, which challenge current guidelines and years of consensus.^[2-5]

Although CULPRIT-SHOCK study was a randomized trial and the researchers compared nearly 40 associated preoperative baseline characteristics and performed differential analysis on more than 50 related variables affecting outcomes, they did not perform further subgroup analysis on the weight of baseline factors and process variables affecting end-point outcomes. As there are many factors affecting the condition and prognosis of patients with cardiogenic shock, it is difficult to draw a completely random matching conclusion only through the study of 706 samples.

The proportion of total acute ST-segment elevation myocardial infarction (STEMI) patients in this study was 62.4%, without a separate subgroup analysis. The proportion of immediate complete revascularization in CRS group was only 81%, but 12.5% of COR strategy patients treated with primary PCI for non-infarct-related artery (IRA) lesions, immediate complete revascularization was achieved in 7.6%. AMI patients with unstable

hemodynamics should not waste time on chronic total occlusion (CTO) and miss the valuable short-term mechanical circulatory support and other better strategies to reduce mortality from multiorgan failure and refractory shock. The EXPLORE trail^[6] suggested that a strategy of early PCI for CTO in patients with STEMI might not improve outcomes. At the same time, there were no differences in the operation success rate and serious complications between the COR group and the CRS group,^[1] indicating that the adoption of CRS in patients with cardiac shock did not increase the risk of routine PCI. Therefore, the CULPRIT-SHOCK study is not enough to challenge the current PCI strategies or guidelines of STEMI patients with cardiogenic shock.^[7]

Approximately 50% of patients with STEMI are associated with MVD,^[8] and the optimum revascularization strategy for non-IRA in these patients remains controversial currently. The newest 2018 European Society of Cardiology (ESC)/European Association for Cardio-Thoracic Surgery (EACTS) guidelines on myocardial revascularization pointed out that complete revascularization is an important factor affecting prognosis, and PCI strategies should be based on the assessment of coronary artery anatomy and physiological function.^[7] For STEMI patients with MVD, complete revascularization for the non-IRA may be performed on the basis of a comprehensive assessment of the actual condition: the clinical status of the patient, and the anatomy and physiological function of the coronary artery. With the improvement of interventional apparatus and antithrombotic drugs, the incidence of restenosis or acute thrombosis was significantly reduced, more research evidence confirmed the

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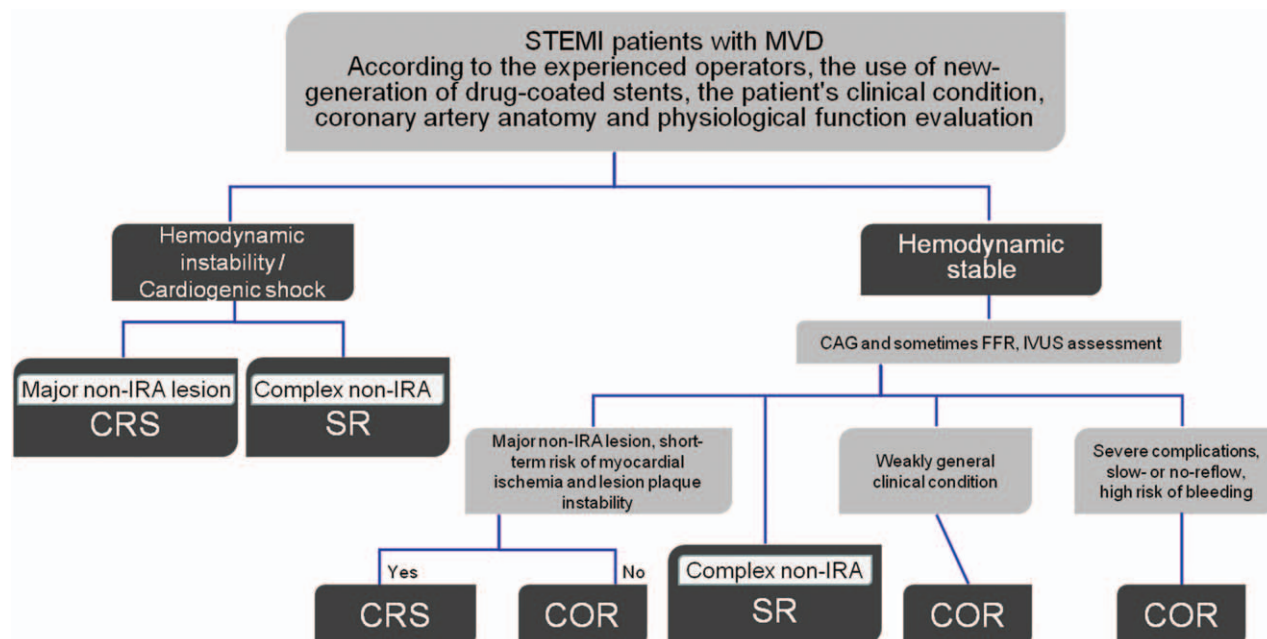


Figure 1: Revascularization strategy of non-IRA lesions: Complete Revascularization based on comprehensive condition. CAG: coronary arteriography; COR: culprit-only revascularization; CRS: complete revascularization in single procedure; FFR: fractional flow reserve; IRA: infarct-related artery; IVUS: intravenous ultrasound; MVD: multivessel disease; SR: staged revascularization; STEMI: ST-segment elevation myocardial infarction.

safety of complete revascularization.^[9-11] Perhaps the strategy of complete revascularization based on comprehensive condition (CRC) would be a more suitable choice in the actual clinical situation. CRC strategy for acute STEMI patients with MVD and hemodynamic instability (mainly refer to cardiogenic shock) can be considered as the follows [Figure 1]: The main non-IRA lesions suggest to be treated with primary PCI at the same time (CRS strategy), but staged revascularization (SR) strategy is recommended for complex non-IRA lesions under evaluation such as fractional flow reserve (FFR), intravascular ultrasound (IVUS), *etc.*

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Conflicts of interest

None.

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