Editorial

Treat or Not to Treat Non-culprit Coronary Artery with Significant Stenosis during Primary Percutaneous Coronary Intervention

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OPEN ACCESS

Received: Dec 22, 2017

Revised: Apr 11, 2018

Accepted: May 8, 2018

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Conflict of Interest

The authors have no financial conflicts of interest.

Author Contributions

Supervision: Kim JS; Writing - original draft: Lee SJ, Kim JS; Writing - review & editing: Kim JS.

► See the article “Complete Versus Culprit-Only Revascularization for ST-Segment Elevation Myocardial Infarction and Multivessel Disease in the 2nd Generation Drug-Eluting Stent Era: Data from the INTERSTELLAR Registry” in volume 48 on page 989.

In these days, primary percutaneous coronary intervention (PCI) is the mainstay for the treatment of patients with ST-segment elevation myocardial infarction (STEMI). However, STEMI patients are more likely to have multi-vessel disease (MVD) and co-morbidities, often leading to frustrated complications such as stent thrombosis even in the 2nd generation drug-eluting stent (DES) era. In this regard, there has been controversy about the clinical benefit of complete revascularization of the non-infarct-related coronary arteries.

There were early observational studies reporting that revascularization of non-infarct-related artery during the primary PCI leads to worse outcomes in MVD and STEMI patients by increasing in-hospital mortality.¹⁾

Promising clinical randomized trials have been reported in DES era, that favors complete revascularization in MVD and STEMI patients. In the Preventive Angioplasty in Acute Myocardial Infarction (PRAMI) trial²⁾, preventive PCI in non-infarct-related coronary arteries was associated with 65% reduction of cardiovascular death, myocardial infarction (MI) and refractory angina. Complete versus Lesion-only Primary PCI (CvLPRIT) trial³⁾ also demonstrated complete revascularization of non-infarct-related coronary arteries during index admission reduces the composite of death, MI, heart failure, and ischemia-driven revascularization by 55%. Intriguingly, in PRIMULTI trial,⁴⁾ complete revascularization guided by fractional flow reserve measurements significantly reduced the risk of death, MI, and ischemia-driven revascularization by 44%.

Given these evidences, the American College of Cardiology Foundation/American Heart Association (ACC/AHA) and European Society of Cardiology (ESC) guidelines for non-infarct-related artery revascularization in STEMI patients with MVD were modified from an earlier class III indication into class IIb indication.⁵⁾⁶⁾ However, most of the previous studies have been conducted using bare metal stent or early generation DES. Therefore, little is known about the efficacy of 2nd generation DES in STEMI patients with MVD. The 2nd generation DES is characterized by improved tissue compatibility and lesser risk of stent thrombosis to enhance a healing process; nowadays recognized as a mainstream treatment modality in coronary artery disease.

The contents of the report are the author's own views and do not necessarily reflect the views of the Korean Circulation Journal.

In this issue of the *Korean Circulation Journal*, Kwon et al.⁷⁾ reported the beneficial effect of complete revascularization in STEMI patients with MVD by analyzing the data from the INcheon-Bucheon cohort of patients undergoing primary percutaneous coronary intervention for acute ST-elevation myocardial infarction (INTERSTELLAR) registry. They compared the incidence of major adverse cardiac events (MACE) between the MVD patients treated with complete revascularization (n=419) and those treated with culprit-only revascularization (n=286). Complete revascularization of STEMI patients with MVD using the 2nd generation DES was associated with a significant reduction of MACE by 36%. Further, the incidence of cardiovascular death, the hardest endpoint, was also significantly lower in patients treated with complete revascularization (adjusted hazard ratio, 0.57; 95% confidence interval, 0.32–0.97; p=0.03). This finding is consistent with the results of other groups.⁸⁾

This study possesses clinical importance since about 25% of patients included for analyses had reduced left ventricular systolic function, which are usually excluded in randomized controlled trials. In conclusion, this study reinforces the usefulness of 2nd generation DES in the treatment of STEMI patients with MVD, thus suggesting the up-to-date treatment strategy. However, previous studies included immediate and staged complete revascularization as a complete revascularization in primary PCI and need to elucidate when immediate complete PCI can be recommended. Furthermore, criteria (anatomical or functional assessment) to intervene for non-culprit lesions should be suggested in future investigations.

REFERENCES

1. Hannan EL, Samadashvili Z, Walford G, et al. Culprit vessel percutaneous coronary intervention versus multivessel and staged percutaneous coronary intervention for ST-segment elevation myocardial infarction patients with multivessel disease. *JACC Cardiovasc Interv* 2010;3:22-31.
[PUBMED](#) | [CROSSREF](#)
2. Wald DS, Morris JK, Wald NJ, et al. Randomized trial of preventive angioplasty in myocardial infarction. *N Engl J Med* 2013;369:1115-23.
[PUBMED](#) | [CROSSREF](#)
3. Gershlick AH, Khan JN, Kelly DJ, et al. Randomized trial of complete versus lesion-only revascularization in patients undergoing primary percutaneous coronary intervention for STEMI and multivessel disease: the CvLPRIT trial. *J Am Coll Cardiol* 2015;65:963-72.
[PUBMED](#) | [CROSSREF](#)
4. Engström T, Kelbæk H, Helqvist S, et al. Complete revascularisation versus treatment of the culprit lesion only in patients with ST-segment elevation myocardial infarction and multivessel disease (DANAMI-3—PRIMULTI): an open-label, randomised controlled trial. *Lancet* 2015;386:665-71.
[PUBMED](#) | [CROSSREF](#)
5. Levine GN, Bates ER, Blankenship JC, et al. 2015 ACC/AHA/SCAI focused update on primary percutaneous coronary intervention for patients with ST-elevation myocardial infarction: an update of the 2011 ACCF/AHA/SCAI guideline for percutaneous coronary intervention and the 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction. *J Am Coll Cardiol* 2016;67:1235-50.
[PUBMED](#) | [CROSSREF](#)
6. Task Force on the management of ST-segment elevation acute myocardial infarction of the European Society of Cardiology (ESC), Steg PG, James SK, et al. ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. *Eur Heart J* 2012;33:2569-619.
[PUBMED](#) | [CROSSREF](#)
7. Kwon SW, Park SD, Moon J, et al. Complete versus culprit-only revascularization for ST-segment elevation myocardial infarction and multivessel disease in the 2nd generation drug-eluting stent era: data from the INTERSTELLAR registry. *Korean Circ J* 2018;48:989-99.
[CROSSREF](#)
8. Kim I, Kim MC, Jeong HC, et al. Optimal timing of percutaneous coronary intervention for nonculprit vessel in patients with ST-segment elevation myocardial infarction and multivessel disease. *Korean Circ J* 2017;47:36-43.
[PUBMED](#) | [CROSSREF](#)