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COMPLETE REVASCULARIZATION IN CORONARY ARTERY BYPASS GRAFTING:



HOW SURE ARE WE?

To the Editor:

The current European guidelines recommend that the completeness of revascularization should be taken into account when determining the most appropriate strategy in treating ischemic heart diseases.¹ In patients who undergo coronary artery bypass grafting (CABG), the benefits of complete revascularization appeared to be shown in previous studies.²

Here, Bianco and his colleagues³ conducted this retrospective study by analyzing 3356 patients operated on between 2010 and 2018 and demonstrated that completely revascularized patients were associated with a greater long-term survival (5-year: 86.5% vs 82.1%), greater freedom from major adverse cardiac and cerebrovascular events (MACCE) (5-year: 72.5% vs 66.7%), and independent lower risk of MACCE (hazard ratio, 0.82; 95% confidence interval, 0.70-0.95). Moreover, they found that incomplete revascularization of nonmain-branch vessels was not associated with mortality or MACCE. The authors are to be congratulated on this meaningful investigation for their rigorous analysis, and it could be considered as important evidence of complete revascularization in a real-world setting. However, there are a few points to be further discussed.

First, should complete revascularization be suggested in all patients undergoing CABG, as a blanket recommendation? Are there actually some patients who might not benefit from, or even do worse with, the complete revascularization, for example, patients with reduced left ventricular ejection fraction, patients with diabetes mellitus, and frail and elderly patients? Also, how would the complete revascularization interact with off-pump CABG or the multiple arterial grafting? Although previous studies have reported that incomplete revascularization in off-pump CABG⁴ or

arterial grafting⁵ had no effect on survival, current evidence is far from enough to fully address these questions. Subgroup analysis or clustering analysis might have helped to dissect out which patients could have a treatment benefit from complete revascularization. In addition, the analysis of the cause of death might enable us to further understand the survival benefit of complete revascularization from the mechanistic aspect.

Then, as regarded as the Achilles heel of all retrospective studies, residue confounding factors should be well-balanced. The authors mentioned that ischemic time, cardiopulmonary bypass time, and Society of Thoracic Surgeons risk score were not available in some patients and thus not adjusted in the inverse probability treatment weighting algorithm nor the multivariable models. Meanwhile, what we are concerned about is that the use of the second arterial conduits (ie, the right internal thoracic artery and the radial artery), which were considered as an important determinant of the long-term outcomes of patients undergoing CABG, was not reported in the manuscript, and any imbalance would, more or less, lead to a certain bias. Furthermore, we should notice that the greater MACCE in the incomplete revascularization group was mostly attributed to myocardial infarction, with no statistical significance observed in re-revascularization (weighted *P* value: .114), or the risk of mortality (hazard ratio, 0.83; 95% confidence interval, 0.67-1.11). Bianco and his colleagues should be commended for providing important information on the results of complete revascularization, but whether complete revascularization indeed brings benefits to patients who undergo CABG, namely, an independent improvement in long-term survival, needs further investigation.

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