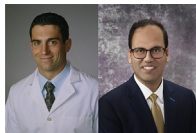


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The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.



**REPLY FROM
AUTHORS: COMPLETE
REVASCULARIZATION,
WHEN SAFE, IS ALWAYS
PREFERRED FOR**



**PATIENTS UNDERGOING CORONARY
ARTERY BYPASS GRAFTING**

Reply to the Editor:

We appreciate the commentary by Zhou and colleagues¹ regarding our recently published study showing the advantages of complete revascularization in patients with multi-vessel coronary artery disease who underwent coronary artery bypass grafting (CABG).² To recap, we found that patients who were completely revascularized by CABG had improved outcomes, including better survival and fewer composite major adverse events (eg, stroke, myocardial infarction, repeat revascularization, death), compared with patients who were not completely revascularized. As we discussed in the manuscript, there are numerous different definitions in the literature for what it means to “completely revascularize” patients, which has made the interpretation of these studies inherently difficult. In the current study, we considered the relevance of bypassing all angiographically significant stenoses. Importantly, we differentiated between main-branch and nonmain-branch vessels and found that incomplete revascularization of nonmain-branch vessels is not significantly associated with survival or major adverse cardiovascular or cerebrovascular events.

Based on the letter to the editor, the basis for the comments made by Zhou and colleagues is the concern that some patients may not be good candidates for complete revascularization due to high-risk baseline characteristics such as diabetes and low ejection fraction. We performed a thorough risk adjustment using inverse probability of treatment weighting, which accounted for numerous baseline characteristics, including diabetes and ejection fraction. Moreover, although

patients at high risk for surgery due to comorbidities may benefit from less-invasive revascularization methods, such as percutaneous coronary intervention, we have published data that argue in favor of performing CABG for the diabetic³ and low ejection fraction⁴ patient populations, although some high-risk cohorts, including elderly patients,⁵ may be at inherently greater risk for CABG.

In addition, important comments were made about the limitations of retrospective study design and possible confounders, such as off-pump procedures and second arterial conduits. While off-pump CABG may represent a different patient population, we did risk adjust for the use of cardiopulmonary bypass in our inverse probability of treatment weighting analysis. Likewise, we did adjust for left main disease and the use of left internal mammary conduits. However, the use of second arterial conduits and the impact on outcomes in completely revascularized patients is an important consideration and is a good topic for future investigations. Finally, because of the retrospective nature of the study, it is challenging to investigate the most common reasons for incomplete revascularization. However, we do feel that poor targets were the most likely factor for nonmain vessel incomplete coronary revascularization.

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