Conduit conundrum: If not two, why three?

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Data have accumulated to support the use of multiple arterial grafts in patients undergoing coronary artery bypass grafting. These data are largely from retrospective studies and meta-analyses.¹⁻⁶ Despite this volume of data, it seems that the benefit of a third arterial conduit in the form of the radial artery may only be realized in patients after more than 10 years of postoperative survival.⁷

In this issue of the *Journal*, Luthra and colleagues⁸ present data from a single-center, retrospective, propensity score-matched study looking at patients receiving bilateral internal thoracic artery (ITA) grafts to the left coronary distribution and either a radial artery (RA) or saphenous vein graft to the right coronary territory. Seven-year follow-up was available for the 167 patients in each group. Survival difference between the groups did not reach statistical significance (69.2% for saphenous vein graft and 88.8% for RA). These findings echo those of Benedetto and colleagues⁹ and of Mohammadi and colleagues¹⁰ for median follow-up times of 10.6 years and 8 years, respectively.

Although it was not statistically significant, one cannot help but notice the divergence in the stratified survival curve in this work. This divergence may be an early indication that, with longer follow-up, survival in the RA group is actually improved, as has been suggested by several other studies.^{2,3,7} Benedetto and Codispoti¹¹ contend that a patient age cutoff of 70 is necessary for the patient to benefit from RA grafting.

A 10,287-patient meta-analysis of propensity score-matched observational studies from early 2017 also demonstrated a long-term survival advantage for patients receiving RA grafting as the third arterial conduit.⁶ As with the study of Luthra and colleagues,⁸ the retrospective nature of these other studies introduces inherent limitations, including matching variability and selection bias.

Certainly, the prospective, multicenter, randomized Arterial Revascularisation Trial¹² (ART) comparing single with bilateral ITA grafting can help clarify the conduit conundrum, right? The 5-year interim analysis would suggest otherwise. The all-cause mortalities were found to be 8.4% and 8.7% for single and bilateral ITA use,

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Central Message

The optimal conduit strategy for surgical revascularization remains a moving target. This study demonstrates no survival benefit when adding a third arterial graft to the right coronary territory.

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respectively, a difference that was small and not statistically significant. In addition, the bilateral ITA group had a significantly higher rate of sternal wound complications.¹² The argument could be made that focus should remain on the single versus bilateral ITA outcomes before adding any additional arterial conduits into the study mix and possibly further blurring the data.

Outcomes after coronary artery bypass grafting are more transparent and heavily scrutinized than ever in the history of our specialty. Compound this phenomenon with the increasing complexity and comorbid medical conditions of patients undergoing coronary artery bypass grafting, and it can be difficult to formulate an optimal strategy for successful revascularization while improving results and survival in the short and long term. At present, careful thought and consideration, as well as an individualized approach to each patient with respect to conduit choice, remains paramount. Perhaps the 10-year ART data will validate the use of bilateral ITAs in appropriately selected patients once and for all. The focus can then be placed on the best conduit choice for additional grafts as the conundrum continues.

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