“Second best”: A good start

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In this issue of the *Journal*, Benedetto and colleagues¹ present a single-institution comparison of the right internal thoracic artery (RITA) and the radial artery (RA) as the second-best arterial conduit in a study of 764 propensity-matched pairs encompassing a 20-year experience with 100% 10-year follow-up. These are impressive sample size and follow-up figures for an observational single-center study. Benedetto is undoubtedly a champion of both the surgical practice and study of arterial conduits, having previously published meta-analyses on randomized, controlled trials and propensity score-matching studies.^{2,3}

Despite evidence demonstrating superiority of arterial conduits to saphenous vein grafts and support by society guidelines,⁴ adoption of bilateral internal thoracic artery and RA use has only been 4% to 12%.⁵ Accordingly, the quality of evidence on arterial grafting is variable. The article of Benedetto and colleagues¹ adds value to the previous meta-analysis³ with new information on comparative survival benefit with left versus right targets. Compared with the meta-analysis, the inclusion rate of propensity-matched groups increased from 39% of the overall study population to 55%.

Unfortunately, “second best” also applies to their study design and selection of end points. First, although propensity score-matching studies may correct for some biases, they remain inferior to randomized, controlled trials and vulnerable to selection bias. Studies comparing propensity score-matching to randomized, controlled trials have shown both overestimation and underestimation of treatment effects.^{6,7} Randomized trials of RITA to RA grafting, even if small, are feasible and should remain the standard for the highest quality of evidence. The 10-year results of the randomized Radial Artery Patency and Clinical Outcomes (RAPCO) trial found contrasting results, with greater actuarial survival for RA conduits in the younger subset of patients (<60 years with diabetes and <70 years otherwise).⁸ This finding was despite equivalent patency.

More importantly, the study of Benedetto and colleagues¹ examined only a single end point: all-cause mortality. No examination of cardiac mortality, angiographic patency, or repeat revascularization was conducted. Although the rationale for using all-cause mortality was

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Central Message

“The best time to plant a tree was 20 years ago. The second-best time is now.” “A society grows great when old men plant trees whose shade they know they shall never sit in.”

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this end point was “a robust and unbiased index for comparative studies because no adjudication is required,” this choice gives us a broad picture of the forest at the expense of the trees. Benedetto and colleagues¹ do acknowledge that this end point leads to mere speculation regarding RITA grafting versus RA grafting. Repeated revascularization is a critical end point in trial-driven recommendations for coronary artery bypass grafting in preference to percutaneous coronary intervention (such as with Synergy Between PCI With Taxus and Cardiac Surgery [SYNTAX] trial) and is an endpoint we cannot discard,⁹ no matter the limitations of the data.

Finally, because deep sternal wound infection (DWSI) concerns are a barrier to bilateral internal thoracic artery adoption, the use of skeletonized RITA should be considered the best practice. In the study of Benedetto and colleagues,¹ the RITA, pedicled in every case, was associated with a nonsignificant 9-times higher rate of sternal wound reconstruction, an outcome for which the study was not powered. Whether these reconstructions were for DWSI or for dehiscence was not specified. A recent study demonstrated an association of DWSI with significantly higher 1-year mortality (10.7% vs 2.5%).¹⁰ It would be interesting to know whether the long-term benefit of RITA was seen in spite of a higher DWSI rate. It is these finer details that would serve surgeons interested in increasing their second-best arterial conduit use.

Benedetto and colleagues¹ should be congratulated for their ongoing investigations, despite the limitations of

the data. RITA, bilateral internal thoracic artery, or RA use is a Society of Thoracic Surgeons guidelines II-A recommendations. Consideration of arterial graft use in determining the optimal approach for each patient is a class I recommendation. It is to be hoped that this study is a good start to a more widespread adoption of arterial grafts.

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