“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).6 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 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 dehiscence. 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

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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.

References


