Radial artery advocacy

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Echo chamber.

Central Message

It is unknown whether radial artery is superior to saphenous vein for bypassing right coronary branches when internal thoracic arteries have been used to bypass the entire left coronary system.

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The point of the Feature Expert Opinion by An and colleagues¹ is to heighten readers' awareness of "...a timely and relevant review article by Gaudino et al...[that presents] a thoughtful approach to the appropriate use of the radial artery (RA)." I commend the authors for introducing their comparison of coronary artery bypass graft conduits objectively: "The evidence to support the use of the RA compared to the saphenous vein (SV) graft or another arterial conduit has not been as robust as the evidence that favors transradial access (TRA) over transfemoral access [in cardiac catheterization]."¹ This timely, relevant, and thoughtful observation is then qualified: "However, a recent patient-level meta-analysis of the 6 [randomized controlled trials] comparing RA to SV graft published in the *New England Journal of Medicine*..." This refers to work by the same authors² presented at the 2018 Annual Meeting of The American Association for Thoracic Surgery as a plenary session late-breaking trial. This member of the audience Googled in vain for a subdefinition of *late-breaking* that included a meta-analysis of trials that are 6 to 15 years old, but perhaps the Program Committee knows something I do not. Clearly there is important impetus behind prominence at the Annual Meeting and inclusion in this esteemed journal, so I should get on with my assignment.

The proposal for RA sharing with cardiology is very reasonable and well presented by Gaudino and colleagues³ in their review article. They deserve credit for engaging so collaboratively, and for summarizing the proposal succinctly. One challenge is that increasing preference for TRA will make such an agreement hard to enforce, particularly if RA use by cardiac surgeons remains mired at < 7%.⁴ That is why experts need to make the best possible case for greater use of the RA. That case has not been made.

Why not? Gaudino and colleagues' well-executed patient-level meta-analysis² did a fine job of turning a sow's ear of underpowered randomized controlled trials into a silk purse with a few suggestive *P* values. However, 784 out of 1036 patients (76%) had RA or SV used for the

circumflex, proving that the great majority of the experience studied represents use of a single internal thoracic artery (ITA) to the left anterior descending artery, and RA or SV everywhere else. In this surgeon's opinion (bias alert!), that is not 2018 best-in-class coronary surgery; rather, it is ideal to use the left ITA (LITA) and right ITA (RITA) for everything in the left coronary distribution, and something else for right coronary branches. Therefore, the subgroup comparing RA and SV in the right coronary territory becomes the most relevant, and there was no difference. RA was superior to SV in the circumflex territory, but that tells us nothing about how RA would have compared with an ITA.

I also quibble with the statement that "technically, the RA length is more adequate than the RITA to graft distal or multiple targets."³ The average radial artery is about 22 cm,⁵ and the average RITA about 20 cm.⁶ Therefore, either conduit is long enough to reach right coronary artery branches and to reach almost all left-sided branches lateral and posterior to the left anterior descending artery as a free graft, especially if anastomosed to the proximal LITA for inflow. Do the authors have some other kind of adequacy in mind?

The cardiac surgery literature stresses the safety of RA removal, and offers few examples of claudication or other functional insufficiency. Even so, common surgical folklore includes caution against using the RA from members of some professions, such as musicians and surgeons. If most surgeons are cautious about subtracting RA inflow

from some patients' hands, those patients will not be represented in the data pool, so how do we know that the demands placed on those specialized hands would not have evoked insufficiency? In an earlier draft of the article, An and colleagues endorsed that common caution, which I applauded, so I was sorry to see it removed from the final product. The authors said they removed it to reduce length as requested by the editors, but retorted, "However...[that topic] is controversial and the senior surgeons in this paper have both used the radial artery...from cardiac surgeons." One wants to know if those were busy surgeons who resumed a busy practice.

Is my criticism Chicken Little alarmism from a Luddite unwilling to adopt new techniques? Consider a 2015 review article stimulated by the accelerating popularity of TRA.⁷ The 3 authors are hand surgeons from the University of Miami and Mayo Clinic. Their 3 key points are that "hemodynamic changes occur within the forearm and hand following sacrifice of the radial artery, complications can be minimized, and radial artery occlusion and distal ischemia...can result in tissue loss and amputation."⁷ They mention a plumber whose RA had been sacrificed who later required ulnar reconstruction to salvage fingers and thumb because he "used his hand as a hammer."⁷ They end with, "Heightening physicians' awareness of the complications is the best means of improving patients' outcomes."⁷

In summary, please do not use my RA—I want to be able to play my piano after I am forced to retire. More seriously: Please do a randomized trial comparing RA to SV when grafting right coronary artery branches. I predict equivalence, but if I am wrong, I will enthusiastically change my practice. Provided I still have an RA with which to practice.

Conflict of Interest Statement

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