Authors have nothing to disclose with regard to commercial support.

received analysis comparing 2 or more arterial conduits to a single internal thoracic artery did show a benefit in terms of mortality and major adverse cardiac events. The high crossover rate from the experimental arm to the control arm and the frequent use of the radial artery in both groups may have diluted the treatment effect. The debate on the role of multiple arterial grafts thus remains far from closed. Currently, the Randomized Comparison of the Outcome of Single vs Multiple Arterial Grafts (ROMA) trial (the second largest study ever in cardiac surgery) has completed the pilot phase and is enrolling 4300 patients in 50 centers to finally prove or refute the multiple arterial graft hypothesis.³

The fact that all this is happening 50 years after the first description of the coronary bypass operation by Favaloro⁴ is noteworthy. It is also instructive that 4 of the 5 largest randomized trials ever performed in cardiac surgery investigated technical details of the CABG operation (the choice of grafts or the use of cardiopulmonary bypass), which is not unexpected, because CABG represents the most commonly performed procedure in adult cardiac surgery in the United States and likely in the world.⁵

In fact, few procedures in the cardiothoracic arena have the same power to elicit impassioned opinions as CABG. A clear example of this is the elegant and balanced letter by Robert Tranbaugh in this issue of *The Journal of Thoracic and Cardiovascular Surgery*, responding to a commentary on another commentary on an original article; this invited reply is thus a commentary at the fourth level!

Clearly, CABG continues to be a central topic among cardiac surgeons, an operation to which we dedicate the greatest number of hours in the operating room and that benefits the greatest number of our patients. That said, we are troubled by the phrase “a CABG, only another CABG.” This sentiment can be commonly heard not only in cardiac surgery operating rooms and wards, but even at the most prestigious academic meetings and conferences, and with some detachment or disinterest.

As the debate on the radial artery clearly shows, there is much to consider in performing a high-quality CABG operation, and still a lot to be learned. Fifty years after Favaloro's initial description, almost every single detail of the procedure has been studied in depth, although, as in the radial artery case, controversy may still persist (of note, the use of the radial artery has now a class Ib indication in the 2018 European Society of Cardiology and European Association for Cardio-Thoracic Surgery guidelines⁶). In any case, thanks to masters like Bob Tranbaugh and Craig Smith, CABG remains not only the “bread and butter” but also the “main course” for most cardiac surgeons. We

may not agree on the details, but we all share passion for the main operation.

And the next debate is whether CABG should also, like complex aortic or mitral surgery, be considered as a subspecialty (superspecialty?) of adult cardiac surgery.

Mario Gaudino, MD^a

David P. Taggart, MD^b

Stephen E. Femes, MD^c

^aDepartment of Cardiothoracic Surgery

Weill Cornell Medicine

New York, NY

^bNuffield Department of Surgical Sciences

University of Oxford

Oxford, United Kingdom

^cSchulich Heart Centre

Sunnybrook Health Science

University of Toronto

Toronto, Ontario, Canada

References

1. Gaudino M, Benedetto U, Femes S, Biondi-Zoccai G, Sedrakyan A, Puskas JD, et al; RADIAL Investigators. Radial-artery or saphenous-vein grafts in coronary-artery bypass surgery. *N Engl J Med*. 2018;378:2069-77.
2. Taggart DP, Altman DG, Gray AM, Lees B, Gerry S, Benedetto U, et al; ART Investigators. Randomized trial of bilateral versus single internal-thoracic-artery grafts. *N Engl J Med*. 2016;375:2540-9.
3. Gaudino M, Alexander JH, Bakaeen FG, Ballman K, Barili F, Calafiore AM, et al. Randomized comparison of the clinical outcome of single versus multiple arterial grafts: the ROMA trial—rationale and study protocol. *Eur J Cardiothorac Surg*. 2017;52:1031-40.
4. Mueller RL, Rosengart TK, Isom OW. The history of surgery for ischemic heart disease. *Ann Thorac Surg*. 1997;63:869-78.
5. Writing Group Members, Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, et al. American Heart Association statistics committee; stroke statistics subcommittee. Heart disease and stroke statistics—2016 update: a report from the American Heart Association. *Circulation*. 2016;133:e38-360.
6. Neumann FJ, Sousa-Uva M, Ahlsson A, Alfonso F, Banning AP, Benedetto U, et al; ESC Scientific Document Group. 2018 ESC/EACTS guidelines on myocardial revascularization. *Eur Heart J*. August 25, 2018 [Epub ahead of print].

<https://doi.org/10.1016/j.jtcvs.2018.09.059>

**RADIAL ARTERY USE IS
SAFE IN PLUMBERS
AND SURGEONS**

Reply to the Editor:

Both written and verbal criticisms of my Editorial Commentary on “Radial Artery Advocacy” indicate that my remarks felt more personal to some readers than I intended them to be. What provoked me to more than customary sarcasm was not personal and was not simply disagreement with the premise that the radial artery is the holy grail in our crusade for more arterial revascularization. The first trigger was when The American Association for Thoracic Surgery program committee gave plenary session prominence, as a “late-breaking” (??) trial, to a meta-analysis, as if to say

Author has nothing to disclose with regard to commercial support.

“attention must be paid!” I realize the program committee is entitled to have opinions, and I had almost recovered from that irritant when the *Journal* raised the ante by soliciting an expert opinion of an expert opinion, written by the same experts! Really?

Two important concessions, before I continue. (1) The evidence base for my own strong belief in the virtues of both internal thoracic arteries is not invincible. (2) My hands being among my favorite organs, it is entirely possible that I egocentrically overvalue them and project that concern on others.

Dr Tranbaugh writes, in part, to assert that I have irresponsibly exaggerated the hazards of radial artery harvest. I know and respect Dr Tranbaugh, and I accept without hesitation that he has harvested the radial artery skillfully in 4000 patients, including surgeons and many others who value their hands. However, without published results and without being able to judge the completeness of follow-up, perfect safety can only be considered an unsubstantiated claim.

Dr Tranbaugh is also correct about the richer context of the case I cited from Chim and colleagues.¹ A radial artery sacrificed to support an ipsilateral elbow rotation flap is playing a different role than a radial artery bypass graft, but it is debatable whether the ulnar-dependent hand would know the difference. The hand-surgeon authors still considered that case to be direct support for their statement “In considering whether the radial artery should be sacrificed, the occupation of the patient...should be carefully considered.”¹ I cannot compel radial artery advocates to agree with them.

In my commentary, I chose not to mention another common practice that I suspect radial advocates will dismiss. As stated by Blitz and colleagues² in an excellent and oft-cited

technical description of radial artery harvest, “If only one RA is harvested, usually the non-dominant arm is chosen.” More of my folklore? Securely evidence based or not, to me it illustrates the hypocrisy behind claims of perfect safety for use of the radial artery. If it is perfectly safe, why do we hedge our bets, when all else is equal, by preferring the nondominant hand or by avoiding hands important to some classes of patients?

Another basis for my skepticism stems from gross anatomy. As I see it, there are 3 structures that have in common a vascular arcade with a redundant arterial blood supply—the hands, the feet, and the brain. They are all active, vital, terminal appendages that stick out into the environment, vulnerable to temperature and trauma, appendages for which there may be evolutionary advantage to a redundant blood supply. Internal carotids, vertebrals, and tibial/peroneal arteries have never been popular conduit choices.

Perhaps it goes without saying that the quality and magnitude of risk and benefit are intimately related. Perfect safety is the only acceptable level of risk when benefits are trivial or unproven. Conversely, some complications become acceptable when the benefits are clear. Those who still disagree with me can stop all my hand-wringing by proving that a radial artery is superior to an internal thoracic artery for the circumflex and superior to the saphenous vein for the right coronary artery.

Craig R. Smith, MD
Columbia Presbyterian Medical Center
New York, NY

References

1. Chim H, Bakri K, Moran SL. Complications related to radial artery occlusion, radial artery harvest, and arterial lines. *Hand Clin.* 2015;31:93-100.
2. Blitz A, Osterday RM, Brodman RF. Harvesting the radial artery. *Ann Cardiothorac Surg.* 2013;2:533-42.

<https://doi.org/10.1016/j.jtcvs.2018.09.103>