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Commentary: The radial artery reality

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The radial artery (RA) was subject to early controversy about poor graft patency, but the past 2 decades have produced data to support its safety and efficacy in patients undergoing coronary artery bypass grafting (CABG). This is likely because of more appropriate distal target selection and the use of pharmacologic adjuncts that aims to reduce RA graft spasm.¹

The bulk of randomized evidence favoring RA over saphenous vein grafts included carefully selected patients in whom RAs were used to bypass predominantly lateral wall coronaries with severe stenotic lesions performed by surgeons experienced in using RAs as conduits in CABG.² The trials results are a reflection of a setup that ensured good quality conduits harvested by skilled operators and minimized conduit injury and spasm. The choice of the target vessel maximized conduit flow with mindfulness about the detrimental effect of native coronary flow competition.

It is important to point out that existing evidence is not entirely complete without the long-term results of the Veterans Affairs radial study, which is the largest randomized trial to compare RA and saphenous conduits and the only trial with patients from the United States.³ The 1-year results of the Veterans Affairs study did not show a difference in angiographic patency (primary outcome) or clinical outcomes between the treatment arms.³ The follow-up data are being analyzed and the final results are anticipated soon.

In their informative survey of centers that participate in 2 cardiac surgery trial consortiums, Robinson and colleagues⁴ reported nearly equal split in the use of endoscopic versus open RA harvesting with few centers (16%) using both techniques. Unlike North American centers where

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Despite general agreement about when to use radial artery grafts in coronary revascularization, there are wide variations in conduit harvesting techniques and antispasm regimens among centers.

endoscopic harvesting prevailed, European centers were more likely to use open harvesting. Another notable difference between the 2 aforementioned regions is the lower utilization of calcium channel blockers by the European centers. This geographical chasm is likely a reflection of different paradigms of surgical practice and perhaps resource-related and not driven by different interpretations of clinical evidence which remains opaque particularly in regard to conduit harvesting techniques.

According to the Society of Thoracic Surgeons Adult Cardiac Surgery Database, the RA is only used in 6.5% of primary CABG cases, whereas a second internal thoracic artery is used in just under 5%.⁵ In our practice, we incorporate RA use as part of a multiarterial grafting strategy that we utilize in the majority of our elective CABG cases because of the anticipated long-term benefits.^{6,7} The right internal thoracic artery is our preferred second arterial graft to bypass coronaries with less-than-critical stenosis and in patients with severe peripheral vascular disease and suboptimal RA conduits. On the other hand, RA conduits are a more attractive option in patients with significant risk for sternal complications.

There is general consensus that using an RA in appropriately selected scenarios is associated with improved long-term CABG outcomes. The harvesting technique per se should not matter as long as it minimizes conduit trauma. For now, it appears that antispasm regimens will continue to be used more often than not.

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References

1. Aldea GS, Bakaeen FG, Pal J, Fremes S, Head SJ, Sabik J, et al. The Society of Thoracic Surgeons clinical practice guidelines on arterial conduits for coronary artery bypass grafting. *Ann Thorac Surg*. 2016;101:801-9.
2. Gaudino M, Benedetto U, Fremes S, Biondi-Zoccai G, Sedrakyan A, Puskas JD, et al. Radial-artery or saphenous-vein grafts in coronary-artery bypass surgery. *N Engl J Med*. 2018;378:2069-77.
3. Goldman S, Sethi GK, Holman W, Thai H, McFalls E, Ward HB, et al. Radial artery grafts vs saphenous vein grafts in coronary artery bypass surgery: a randomized trial. *JAMA*. 2011;305:167-74.
4. Robinson NB, Audisio K, Cancelli G, Masterson Creber RM, Fremes SE, Gelijns AC, et al. Current practice patterns for use of the radial artery for coronary surgery in dedicated centers. *J Thorac Cardiovasc Surg*. 2022;163:e251-2.
5. Schwann TA, Habib RH, Wallace A, Shahian D, Gaudino M, Kurlansky P, et al. Bilateral internal thoracic artery versus radial artery multi-arterial bypass grafting: a report from the STS database. *Eur J Cardiothorac Surg*. 2019;56:926-34.
6. Dimeling G, Bakaeen L, Khatri J, Bakaeen FG. CABG: when, why, and how? *Cleve Clin J Med*. 2021;88:295-303.
7. Akhrass R, Bakaeen FG. The advantage of surgical revascularization in diabetic patients with multivessel disease: more arterial conduits, more benefit. *J Thorac Cardiovasc Surg*. February 27, 2021 [Epub ahead of print].

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Commentary: The sound before a radial blast

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Total arterial coronary artery bypass grafting, when anatomically appropriate, is quickly becoming the new benchmark of modern revascularization guidelines. Despite accumulating evidence toward improved long-term patency with arterial grafts, the degree of implementation and specific institutional practices remain highly variable. Particularly regarding the use of radial arterial grafts, the use of calcium channel blockers (CCBs) and endoscopic harvesting techniques have become popular to reduce invasiveness as well as the risk of vasospasm, but to what degree they are utilized globally is unknown.¹

Given this background, the study by Robinson and colleagues² contributes a deeper understanding into the current practices surrounding radial arterial graft use in high-volume coronary artery bypass grafting centers across 4 continents. Among the 69 centers that participated in this survey study from the Randomized Comparison of the Outcome of Single versus Multiple Arterial Grafts Trials

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As radial arterial grafting techniques gain importance in contemporary revascularization, harvesting methods and medical management ways to reduce vasospasm and improve long-term outcomes are needed.

Network and the Cardiothoracic Surgical Trials Network, CCBs, most commonly amlodipine, were prescribed post-operatively at nearly 70% of the centers, and endoscopic harvesting technique was available at 56.5%. Both practices were significantly more common in North America than in Europe.

These findings are reflective of the still-evolving nature of the guidelines surrounding radial arterial graft use, and the need for the cardiac surgical community to more assertively study and establish best practices. As the authors note, recent studies have demonstrated a difference in clinical or angiographic outcomes with the use of CCBs, contrary to some of the older studies in the literature.³ The optimal timing or duration of administration remains to be further studied. Similarly, regarding radial arterial harvesting technique, the endoscopic approach has been shown to provide equivalent angiographic patency and

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