

References

1. Hwang H, Paeng JC, Kang J, Jang M-J, Kim K-B. Relation between functional coronary artery stenosis and graft occlusion after coronary artery bypass grafting. *J Thorac Cardiovasc Surg.* 2021;161:1010-8.e1.
2. Kim KB, Hwang HY, Hahn S, Kim JS, Oh SJ. A randomized comparison of the saphenous vein versus right internal thoracic artery as a Y-composite graft (SAVE RITA) trial: one-year angiographic results and mid-term clinical outcomes. *J Thorac Cardiovasc Surg.* 2014;148:901-7; discussion 907-8.
3. Fukui T, Tabata M, Manabe S, Shimokawa T, Morita S, Takanashi S. Angiographic outcomes of right internal thoracic artery grafts in situ or as free grafts in coronary artery bypass grafting. *J Thorac Cardiovasc Surg.* 2010;139:868-73.
4. Gansera B, Schmidler F, Angelis I, Kiask T, Kemkes BM, Botzenhardt F. Patency of internal thoracic artery compared to vein grafts—postoperative angiographic findings in 1189 symptomatic patients in 12 years. *Thorac Cardiovasc Surg.* 2007;55:412-7.
5. Sabik JF III, Lytle BW, Blackstone EH, Houghtaling PL, Cosgrove DM. Comparison of saphenous vein and internal thoracic artery graft patency by coronary system. *Ann Thorac Surg.* 2005;79:544-51; discussion 544-51.
6. Tatoulis J, Buxton BF, Fuller JA. The right internal thoracic artery: the forgotten conduit—5,766 patients and 991 angiograms. *Ann Thorac Surg.* 2011;92:9-15; discussion 15-7.

See Article page 1010.



Commentary: Y bother?

Aaron Bettenhausen, MD, and Edward Y. Sako, MD, PhD

In this edition of the *Journal*, Hwang and colleagues<sup>1</sup> explored the impact of severity and significance of coronary artery stenosis on graft patency following coronary artery bypass grafting. Specifically, they sought to determine the impact of functional significance of the stenosis compared with the angiographically determined degree of stenosis. To determine functional significance, they used myocardial single-photon emission computed tomography (SPECT).

During the 5-year study period, 295 patients underwent off-pump coronary artery bypass grafting with composite y-grafts (42 right internal thoracic artery and 253 saphenous vein) based off an in situ left internal thoracic artery for an average of 3.5 distal anastomoses per patient. A total of 1031 anastomoses were then surveilled at 1 and 5 years via either standard or multidetector computed tomography angiography. The authors found that lack of functional ischemia, particularly in arteries with less than severe (90%) stenosis, was a risk factor for graft occlusion.<sup>1</sup>



Will it stay open?

CENTRAL MESSAGE

Understanding the severity and significance of coronary artery stenosis may eventually help guide surgical revascularization strategies.

Advancing technologies, such as fractional flow reserve, are now helping guide coronary interventions. Understanding the importance of not only the anatomic degree of coronary stenosis but also the physiologic degree of stenosis has made a large impact on the decision-making process of percutaneous coronary intervention.<sup>2,3</sup> How this information translates to bypass graft patency is not entirely clear, as the concept of competitive flow is an issue solely limited to surgical revascularization.

Composite configurations and use of sequential grafts have not clearly been shown to be inferior with regards to patency rates.<sup>4</sup> However, use of such grafts complicates the issue of competitive flow and factors that may lead to graft occlusion. This limits what useful information can be extracted from this study, as these configurations may introduce the potential for competition in flow not only between graft and native vessel, but between components of the graft itself. Furthermore, few data were provided

From the Department of Cardiothoracic Surgery, University of Texas Health Science Center at San Antonio, San Antonio, Tex.

Disclosures: E.Y.S. has a financial relationship with Medtronic, Inc. A.B. reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Dec 2, 2020; revisions received Dec 2, 2020; accepted for publication Dec 3, 2020; available ahead of print Dec 17, 2020.

Address for reprints: Edward Y. Sako, MD, PhD, Department of Cardiothoracic Surgery, University of Texas Health Science Center at San Antonio, Mail Code 7841, 7703 Floyd Curl Dr, San Antonio, TX 78229-3900 (E-mail: sako@uthscsa.edu).

*J Thorac Cardiovasc Surg* 2021;161:1020-1

0022-5223/\$36.00

Copyright © 2020 by The American Association for Thoracic Surgery

<https://doi.org/10.1016/j.jtcvs.2020.12.031>

with regards to which vessels were chosen for arterial grafts. Competitive flow issues have been known to be more pronounced with the use of arteries as the bypass conduit.

Also missing from the study was the clinical significance of graft occlusion. Were they related to any major associated cardiovascular events? What was the fate of the native vessel? What were the indications for obtaining an angiogram at 1 or 5 years and what bias does that introduce?

The authors attempt to tackle a worthwhile matter, factors that influence coronary artery bypass graft patency. Interestingly, the authors choice of SPECT does add to the limited data surrounding the application of the technology. SPECT is assessable, economic, and noninvasive but there are some limitations, namely small vessel disease, viability, and balanced ischemia. However, the use of off-pump techniques combined with composite mixed

venous/arterial configurations and bias in patient selection greatly limit one's ability to infer practical conclusions from the data. Finally, what are the implications of the findings? How should one approach a vessel with a 70% angiographic stenosis that has no evidence of functional ischemia? Should we bother?

### References

1. Hwang H, Paeng JC, Kang J, Jang M-J, Kim K-B. Relation between functional coronary artery stenosis and graft occlusion after coronary artery bypass grafting. *J Thorac Cardiovasc Surg.* 2021;161:1010-8.e1.
2. Pijls NH, van Schaardenburgh P, Manoharan G, Boersma E, Bech JW, van't Veer M, et al. Percutaneous coronary intervention of functionally nonsignificant stenosis: 5-year follow-up of the DEFER Study. *J Am Coll Cardiol.* 2007;49:2105-11.
3. Tonino PA, De Bruyne B, Pijls NH, Siebert U, Ikeno F, van't Veer M, et al. Fractional flow reserve versus angiography for guiding percutaneous coronary intervention. *N Engl J Med.* 2009;360:213-24.
4. Robinson BM, Paterson HS, Naidoo R, Dhurandhar V, Denniss AR. Bilateral internal thoracic artery composite Y grafts: analysis of 464 angiograms in 296 patients. *Ann Thorac Surg.* 2016;101:974-80.