ARTERIAL VERSUS VENOUS CONDUITS IN CORONARY ARTERY BYPASS SURGERY: COMPARING APPLES WITH ORANGES

To the Editor:

In a recent Expert Opinion article, “Additional arterial conduits in coronary artery bypass surgery: Finally coming of age,” Gaudino and colleagues¹ cite the landmark publication 50 years ago by Rene Favaloro, who introduced the saphenous vein as a graft in coronary artery bypass grafting.² The authors then proceed to suggest that “the ideal choice of conduits for revascularization...use predominantly either internal thoracic or radial arteries.” Although the superiority of the internal thoracic artery is recognized and supported by the various trials mentioned in their article, there are doubts regarding the data presented for the radial artery versus the saphenous vein. Here, the authors refer to the RADIAL Investigator trial, where at a mean follow-up of 5 years the radial artery was associated with a significantly lower risk of adverse cardiac events, repeat revascularization, and myocardial infarction and a better patency rate compared with the saphenous vein.³

It is noteworthy that, in the majority of trials in their analysis, the saphenous veins were harvested with pedicle removed as originally described by Favaloro,² whereas the radial arteries were harvested with pedicle intact. An atraumatic, no-touch, technique of harvesting the saphenous vein provides an improved graft with a long-term patency comparable with the internal thoracic artery at 16 years.⁴ Using this technique, the saphenous vein is harvested with pedicle intact, reducing vascular damage and preserving the vein's normal architecture.⁵ When one examines explants and histologic sections of no-touch versus conventionally prepared saphenous vein, the appearance is very different (Figure 1). Indeed, it may be suggested that it is similar to comparing apples with oranges and that these “additional surgical interventions” are “themselves additional competing factors”⁷ that may affect saphenous vein graft performance. An earlier randomized trial showed, on angiographic follow-up, that there was a significant superiority of no-touch versus radial artery grafts at mean period of 36 months postoperatively ($P = .01$).⁸ Therefore, based on the discrepancy between this and the The Radial

FIGURE 1. Comparison of no-touch and conventional saphenous veins used for CABG. *Left*, No-touch saphenous vein at harvesting with surrounding tissue intact (“unpeeled apple”). Below is a representative transverse section that has all layers intact and undamaged. *Right*, A conventionally harvested saphenous vein that has surrounding tissue removed (“peeled” apple). Below is a representative, conventionally harvested, transverse section that has been distended and had much of its outer layer removed and damaged. Modified from Kopjar and colleagues.⁶ Vascular damage inflicted when harvesting by the conventional method is suggested to affect graft patency.⁵

Artery Database International Alliance (RADIAL) trial data, we suggest that no-touch and conventional saphenous vein graft data should be considered separately.

Indeed, in their summary Gaudino and colleagues¹ propose “It is time to clarify the effect of procedural characteristics on clinical outcomes and to define the most appropriate strategy for each individual patient.” Where a recent reanalysis of the pooled data from the RADIAL trial was performed to include no-touch saphenous vein data, the reported difference in graft patency between the radial artery and saphenous vein dissipates.⁶ We agree that appropriate

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individual strategies, such as method of graft preparation, should be considered. Further studies are required comparing radial artery, conventional, and no-touch saphenous vein grafts if the true preferred second conduit for coronary artery bypass grafting is to be established.

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FRUIT SALAD

Reply to the Editor:

"Comparing apples and oranges" is one of the most frequent quotations in the medical literature. A PubMed search in November 2018 retrieved 131 publications mentioning this

idiom (the great majority of them either at the beginning or at the end of their title). For historical precision, the first appearance of the quote dates back to 1971 in *Dental Economics*.¹

In any case, the meaning is pretty obvious: it is about a comparison of items that are known (or strongly assumed) to be incomparable. In their letter, Dashwood and Loesch use the idiom for the 132nd time (at least) in referring to the comparison of the radial artery to the no-touch and conventionally harvested saphenous vein and refer specifically to the results of the recently published RADIAL database.² Supporting their claim on the RADIAL fruit salad, Dashwood and Loesch quote a small randomized trial by Dreifaltdt and colleagues³ that shows a better patency rate for the no-touch saphenous vein than for the radial artery, and an aggregate data meta-analysis of the trials included in RADIAL, with the addition of the latter study reporting the same result.⁴

As detailed elsewhere, the study of Dreifaltdt and colleagues³ was not included in the RADIAL analysis after a careful evaluation of its several methodologic flaws.⁵ The most important (and fatal) flaw was its unique use of the radial artery in open contrast with all the guidelines and recommendations (and the common practice), which require target vessel stenosis to be less than 70% in the left coronary system and 90% in the right.⁴ In the trial in question, the radial artery was anastomosed to targets with stenosis of less than 70% in 31% of the cases and less than 90% in 69% of the cases, introducing a clear methodologic bias in favor of the venous conduit. As detailed elsewhere, when adjusted for this incorrect use of the arterial conduit, the difference in patency rate between the conduits in the study of Dreifaltdt and colleagues³ does not reach statistical significance.⁴ Of note, another trial that used the no-touch saphenous vein but used the radial artery according to commonly accepted standards was included in the RADIAL analysis.⁶

I could conclude by saying that including the trial of Dreifaltdt and colleagues³ in RADIAL would have been like comparing apples and oranges—but I do not like the idea of being number 133.

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