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ENDOSCOPIC HARVESTING WILL SECURE A SILVER MEDAL FOR THE NO-TOUCH

SAPHENOUS VEIN AND BRONZE FOR THE RADIAL ARTERY

To the Editor:

In their recent commentary, Deb and Fremes¹ discuss the ongoing controversy regarding the use of the radial artery (RA) or saphenous vein (SV) as the second conduit of choice for coronary artery bypass grafting (CABG). Most recent publications by proponents of the RA are based on ongoing analyses from the Radial Artery Database International Alliance (RADIAL) project. The latest trial concludes, “compared with the use of SV grafts, the use of RA grafts for CABG resulted in a lower rate of adverse cardiac events and a higher rate of patency at 5 years of follow-up.”² When comparing the patency of these 2 conduits, the RADIAL project analyzed data in which SVs were harvested conventionally, excluding data on SVs harvested by the no-touch technique (NT).^{3,4} Of note, if angiographic patency data of the RADIAL trials had been supplemented with previously published RA versus NT SV data, the difference in risk of graft occlusion between both grafts dissipates.⁴ The latest results from the Orebro group, commented on by Deb and Fremes,¹ shows that after 8 years of follow-up, NT SV grafts have excellent patency similar to that of RA grafts.⁵ A concern, by some, regarding NT SV harvesting, is the issue of early leg wound infections. Their Commentary concludes “future research incorporating a no-touch technique in endoscopic or other minimally invasive harvesting methods is needed.”¹ This is certainly true and a point previously raised in a review⁶ addressing the trade-off between wound healing and graft patency when comparing endoscopic and NT SV harvesting. Many centers worldwide have adopted the NT technique with minimally invasive NT harvesting methods being developed, such as that described recently by Hayashi

FIGURE 1. An example of endoscopic SV harvesting. A photograph showing an SV being endoscopically harvested where it is separated from its cushion of perivascular fat and where adventitial microvessels/vasa vasorum (arrows) are damaged and blood supply to and from the perivascular fat is disconnected. PVF, Perivascular fat; SV, saphenous vein.

and colleagues.⁷ The improved performance of NT SV grafts is due to reduced vascular damage at harvesting and preservation of normal vein architecture. Like conventionally harvested SVs, those removed endoscopically are subjected to varying degrees of damage due to surgical trauma, manipulation by instruments, traction, and intraluminal distension.⁶ As in conventional harvesting, the perivascular fat is removed and adventitial microvessels damaged in SVs prepared endoscopically (Figure 1). Furthermore, preservation of perivascular fat is suggested to play an important role in the superior patency of NT SV grafts by providing mechanical support and acting as a source of beneficial adipocyte-derived factors.⁶ The SV is the second conduit of choice for CABG in Brazil, with NT SV grafts used in many centers in this country and being the preferred second conduit of choice in many centers worldwide. We believe, with the advent of minimally invasive NT harvesting, the NT SV graft will secure its position as the second conduit of choice for CABG.

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REPLY: WINNERS: WHERE, WHEN, AND WHY

Reply to the Editor:

We read with interest the letter by Dashwood and colleagues¹ on minimally invasive no-touch (MINT) saphenous vein graft (SVG) harvesting as a preferred second conduit of choice in coronary artery bypass grafting (CABG) procedures. We note that the title of the letter suggests a head-to-head competition with a clear winner and loser. We applaud their enthusiasm for continuing efforts to explore and improve CABG patency, but their optimism regarding widespread MINT SVG adoption deserves prudent review.

First, the published experience with no-touch (NT) SVG appears to be quite limited. As far as we know, only 3 single-center studies comparing the radial artery with NT SVG method have been published, of which 1 was a later-term follow-up on previous results. The sample size and follow-up from these 2 centers is as follows: 60 patients at 1 year,² 99 patients at 3 years,³ and 84 patients at 8 years.⁴ Whether results can be generalized from these small studies to all patients undergoing CABG procedure is a question—Song and colleagues² excluded patients aged <70 years and had a higher than average proportion of female patients (48%), whereas Dreifaltdt and colleagues³ excluded patients aged >65 years, those with left ventricular ejection fraction <40% and chronic kidney disease, plus only 19% of patients had diabetes. This precludes subgroup analysis as was done in the Radial Artery Database International Alliance (RADIAL) project.⁵ Further, the study by Dreifaltdt and colleagues⁴ was designed as a noninferiority trial. Therefore, any post hoc analysis claiming superiority is less methodologically sound. Dreifaltdt and colleagues⁴ also did not adhere to contemporary management of radial artery grafts, with

only 24% of patients undergoing radial artery grafts receiving calcium-channel blockers.⁴

Samano and colleagues⁶ compare NT to conventional SVG harvest. That article was held out by Kopjar and colleagues⁷ as supporting long-term NT SVG patency out to 16 years. Notable to this study is that the authors excluded 1 of the 3 randomization groups from the last 2 follow-ups. The reported 16-year follow-up included only 34% of the initial cohort.

Dashwood and colleagues¹ also cite Kopjar and colleagues,⁷ noting that if the angiographic patency data of the 5 trials with protocol-driven angiography were supplemented with data from the Örebro group, the difference in risk of graft occlusion between the radial artery and SVG dissipates. We are unclear why Kopjar and colleagues⁷ chose to include data from Dreifaltdt and colleagues³ but not Song and colleagues² in their post hoc analysis. It also raises the issue of selective outcome analysis. Angiographic patency is only 1 outcome. Major adverse cardiovascular events, cardiovascular mortality, and long-term mortality were the main end points of the RADIAL project. To insert 1 small, single-center study into 1 subanalysis of the RADIAL project is not our preferred method of analysis. As we have seen, the 10-year Arterial Revascularization Trial results have not shown translation of improved patency with the most important patient outcomes.⁸ Until they do, the pendulum will not swing rapidly.

Finally, there are no studies comparing MINT SVG to other conduits. A number of questions specific to the endovascular harvesting aspect of MINT SVG remain unanswered. What is the feasibility of training assistants in this technique? Will widespread dissemination lead to diluted results in real-world practice, when compared with the excellent results thus far obtained in the 2 small studies? Dashwood and colleagues¹ state that “many centers worldwide have adopted the NT technique with MINT harvesting methods being developed.” If this is the case, then there should be adequate data (quantitatively speaking) to examine both angiographic and clinical outcomes. In addition, qualitative scientific rigor and follow-up need to be applied. There are nuances that need to be considered in the study design. Dreifaltdt and colleagues³ confirmed that “the patency rate for [radial artery] grafts depended mostly on the degree of stenosis of the target vessels,” and this needs to be accounted for in study design, as well as the territory grafted, and the use of calcium-channel blockers for radial artery grafts. Such studies should be conducted in the spirit of collaboration and not competition. Ultimately, the question may not be whether to use MINT SVG or radial artery graft, but which to use, when, and where.

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