

The author reported no conflicts of interest.

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and Gaudino² seem to take exception to the study's focus on how, rather than when, to perform BIMA grafting. They describe the 2.5% incidence of mediastinitis in the study as both “disturbingly high” and “consistent with the overwhelming majority of other BIMA reports” and suggest that those not inclined to perform BIMA grafting can interpret the study's findings as further reason to avoid harvesting the second artery.

In response, Kalavrouziotis and Mohammadi³ note that the study included only patients who underwent BIMA grafting and therefore could not address whether 2 IMA grafts are better than 1, and reaffirm their belief that “how to BIMA” is not simply a different issue, but rather a key issue. They unfairly ascribe to Schwann and Gaudino's² statements “that that the configuration of BIMA grafts has no relevance,” and “is of no prognostic importance” and postulate the inability to demonstrate the superiority of BIMA grafting stems from failure to identify the “optimal BIMA configuration,” which their study suggests requires the use of both IMA conduits as in situ grafts. Unfortunately, as noted previously,⁴ this finding was based on a relatively small number of free grafts performed for various reasons over a prolonged timeframe and did not account for, in the words of the authors themselves, the “many different factors, including degree of coronary stenosis, the size and quality of target vessels, and distal run-off” upon which “the incredibly nuanced complexity of contemporary coronary surgery” most certainly does depend.²

Surgeon experience and technical proficiency, not only in performing the grafts, but also in deciding where and how to place them, are likely more important factors than whether or not an IMA should be used as a free versus in situ graft. Furthermore, use of a pedicled right IMA graft does not preclude the possibility of poor decision making or a technical mishap. How far will it safely reach? Should it cross the midline or pass through the transverse sinus? Or, is it best utilized as a free graft? If so, where should it go, and considering its proximal anastomosis as an additional confounder, from whence does it come?

The evidence to date strongly support placing an in situ IMA—preferably the left—to the left anterior descending artery, whenever possible. Beyond that, everything else is less certain, including consensus for which patients should

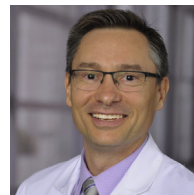
undergo BIMA grafting. If <10% of patients is too few, what then is the appropriate percentage? Why is it that no prospective randomized study has shown the superiority of BIMA grafting?⁵ Maybe it just is not. Or perhaps the various surgeon-, patient-, conduit-, and target-related factors cannot adequately be accounted for. Whatever they intended, the study by Kalavrouziotis and colleagues³ most certainly did not answer any of these questions.

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REPLY: IN BE- “TWIX”: A BIMA ARGUMENT Reply to the Editor:



There is a confectionery with 2 candy bars contained in a single package. The video advertisement for this product humorously implies that the “left” bar is manufactured in the “left bar factory” separately from the “right” bar, and the manufacturing secrets are jealously guarded from each other. It is obvious that the 2 bars are the same, which is the basis for the ridiculousness. So too is the left internal mammary artery (LIMA) the same as the right internal mammary artery (RIMA). The RIMA releases the same vasoactive substances, has the same composition, and reacts to stimuli the same as the LIMA. If either were used as an in situ graft to the same target, there would be no reason to suspect their fates would differ. Given that the LIMA is such a good conduit and no different than the RIMA, why do we not use the RIMA more often as an additional arterial conduit? The argument might be that the target vessel or the patient is unworthy of such a good conduit, or that it cannot reach the target, or that it would induce mediastinal infection in excess of the

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benefit provided by bilateral internal mammary artery (BIMA) use. Whatever the reason, we know that BIMA use is not widespread, and in 2014 was estimated to be 4.3% in North America.¹

Marzouk and colleagues² compared BIMA coronary artery surgery outcomes when the RIMA was used as a free graft rather than as an in situ graft. In their commentary, Schwann and Gaudino³ implied that a more relevant question than *how* to use BIMA (ie, configuration) is *whether* to use BIMA. It is true that most cardiac surgeons are unwilling to use all-arterial or maximal-arterial grafting strategies in their coronary practices,¹ and whether to use BIMA will remain a contentious issue. Who knows what's going on in that "right bar factory"! But how we use BIMA is indeed the question, as Kalavrouziotis and Mohammadi⁴ replied in their letter to the editor. With some criticism that we do not know the reason why free RIMA recipients fared worse than in situ RIMA recipients, Marzouk and colleagues² showed that, whatever the reason, they fared differently. Thus, "how to BIMA" can be said to matter.

Coronary artery surgery is a subspecialty in itself, and it is doubtful that any subspecialty coronary surgeon would consider not performing a second arterial graft to the lateral wall as the starting point for their revascularization strategy. In combination with the radial artery, BIMA is an integral part of this strategy. When only 2 arteries are used for the revascularization, a radial artery strategy may be associated with fewer complications⁵ and greater ease of access. Deference to a radial artery over a RIMA may partly account for the lower use of BIMA strategies. Arterial graft configuration (eg, in situ composite arterial grafts, T grafts, aortoarterial grafts, sequential grafts) may also impact outcome. Becoming facile with extending in situ BIMA-based conduits to reach coronary targets opens the possibilities for maximal arterial grafting. It will be these outcomes, stratified by how arterial grafting is done, that will determine whether it should be done.

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REPLY FROM AUTHORS: A QUESTION VERSUS THE QUESTION



Reply to the Editor:

We read with interest the Letter to the Editor by Kalavrouziotis and Mohammadi¹ regarding our recent invited commentary² on their study comparing distinct bilateral internal mammary artery (BIMA) grafting strategies.³ One goal of an invited commentary is to contextualize a manuscript within the overall fund of knowledge available at a given time. Another goal of an invited commentary is to objectively point out the possible impact of a given manuscript on future surgical innovation and consequent improvement of patient-centric outcomes. This was the exclusive aim of our thoughts expressed in the invited commentary on the excellent study of Marzouk and colleagues. We commend the authors' contribution to the field of multi-arterial grafting, share their belief in the value of multi-arterial grafting, and continue articulating its benefits for our patients. Indeed, we never state anything to the contrary.

Our comments are intended to crystallize to the journal readership the possible formidable obstacles to a broader adaptation BIMA grafting into the clinical practice, which we believe we presented objectively. The "inconvenient truth" is that despite multiple observational studies uniformly documenting the benefits of BIMA grafting, the technique continues to be used rarely, particularly in the United States, except at selected centers with expertise in and dedication to this technique. In those institutions, the reported results are enviable. We certainly agree with the authors that the specific deployment of a BIMA grafting strategy warrants further careful analysis. That certainly is "a question" worth asking, and we congratulate the authors for presenting their perspective and excellent results. But