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Commentary: Coronary artery bypass with bilateral internal thoracic arteries: Could smaller be considered better?

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The sternotomy remains the most common approach for most cardiac surgical procedures, allowing for excellent exposure, predictability, and a high degree of surgical control. When adopting a minimally invasive approach, a central principle is that the results achieved must be, at minimum, the same as the conventional counterpart. If this can be achieved, then the minimally invasive approach can be considered better. However, it must also be recognized that as invasiveness decreases, complexity increases, and control over the procedure is necessarily diminished. In cardiac surgery, where there are multiple interactions necessary for the procedure, it is crucial to respect the balance between these factors. Minimally invasive cardiac surgery typically focuses on valve interventions. Although certain specialized centers have taken up minimally invasive coronary artery interventions enthusiastically, these complex and technically challenging procedures are less common than their valve counterparts.

When considering coronary artery bypass grafting (CABG), we continue to debate the merits of different

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CENTRAL MESSAGE

Sternal-sparing minimally invasive coronary artery bypass using bilateral internal thoracic arteries can be performed safely with encouraging early patency results.

grafting strategies. It has been demonstrated that arterial grafts, when used correctly, can be expected to outlast saphenous vein grafts.^{1,2} Clinically, however, bilateral internal thoracic artery (BITA) use has shown inconsistent evidence. Although observational studies appear to support its use, a recent prominent trial demonstrated no mortality difference at 10 years.^{3,4} The question of BITA use in CABG should by no means be considered settled.

In this issue of the *Journal*, Davierwala and colleagues⁵ have endeavored to tackle both problems: minimally invasive multi-arterial revascularization and use of bilateral internal thoracic arteries.⁵ Off-pump, minimally invasive, multivessel CABG via a left anterior thoracotomy was performed in 88 patients. BITA harvest was undertaken in a skeletonized fashion under direct vision. Y-grafting was used to avoid aortic manipulation. Overall results are encouraging. There was an absence of in-

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hospital mortality, although a single postoperative arrest required extracorporeal membrane oxygenation, and there was 1 perioperative myocardial infarct. A single patient had a mortality event within 30 days. Respiratory complications were more common, with 12 outcome events. Multivariable regression demonstrated increased odds of respiratory complications with an increased length of surgery (odds ratio, 1.02, 1.008-1.034). Internal thoracic artery patency was excellent postoperatively, with an overall angiographic patency of 96.8%.

This study needs to be interpreted within the context of some major limitations. This is a small noncomparative series. The patient population is heavily selected, with patients having more optimal body habitus, ejection fraction, and ventricular dimensions. The right coronary system was grafted far less frequently in this series (9 patients), suggesting selection against right coronary territory grafting. Although multivariable regression was used to determine predictors of respiratory complications, a small study population with relatively few outcome events makes these results less reliable. Finally, although angiography demonstrated excellent early patency, what really matters is how these grafts fare in the long term.

This study demonstrates that minimally invasive multiarterial revascularization is safe and reproducible without requiring advanced endoscopic or robotic assistance. Although more comprehensive and long-term study is required, this represents an important incremental step in the evolution of minimally invasive CABG.

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Commentary: The evolution of coronary artery bypass surgery: Toward a better operation

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"Insanity is doing the same thing over and over again and expecting different results."

—Albert Einstein

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A better CABG operation on the horizon.

CENTRAL MESSAGE

Sternal-sparing surgery completely avoids sternal wound infection.

The evidence for the potential long-term benefits of multiple arterial grafts has been available for approximately 3 decades. The survival benefit of the use of bilateral