Commentary: A tree in winter: The case for arterial grafting in the diabetic patient

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“I wonder if the snow loves the trees...it covers them up snug... “Go to sleep, darlings, till the summer comes again.”

— Lewis Carroll, *Alice’s Adventures in Wonderland & Through the Looking-Glass*

Diabetic individuals currently comprise half the patients who have undergone coronary artery bypass grafting (CABG) in the Society of Thoracic Surgeons database. The association of diabetes with cardiovascular disease is dramatic: Diabetic patients are 2 to 4 times more likely to have cardiovascular disease, and at least 65% will die of their cardiovascular disease.¹ Because the nature of their cardiovascular disease tends to be extensive and diffuse, with multivessel involvement,^{2,3} numerous prospective, randomized, controlled trials have shown the benefit of CABG versus percutaneous coronary intervention in diabetic patients with multivessel disease.⁴⁻⁷ The general reluctance of American surgeons to perform bilateral internal thoracic artery (BITA) grafting is even more pronounced in the diabetic patient because of a heightened concern for deep sternal wound complications (DSWIs). Specifically addressing such concerns, the meta-analysis of Zhou and colleagues⁸ informs us that compared with single internal thoracic artery grafting, BITA is associated with enhanced long-term survival and that with the use of the skeletonized technique, there is no increased risk of DSWI. Although a similar message was delivered by a previous meta-analysis,⁹ which cited many of the same studies, this updated review adds data from an additional 5 studies encompassing 125,542 additional patients, including 1 prospective randomized control trial. Although the data on DSWI support the concern for increased risk in patients with BITA, when limiting analysis to studies that documented a skeletonized harvesting technique, that difference disappears. Operative mortality is equivalent, although data on longer-term survival clearly seem to favor BITA grafting, even more so for those studies that performed

A tree in winter.

Central Message

Mounting evidence of the benefit of arterial grafting in diabetic patients still lacks the granular information that will help drive decision making.

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propensity matching and even further for those studies that reported cardiac-specific mortality.

One might argue that if retrospective studies are prone to bias, despite the best of statistical gymnastics, then meta-analyses of multiple retrospective studies may simply aggregate and exaggerate the impact of that bias, especially when the 1 prospective randomized control trial does not appear to corroborate the findings (although when analyzed according to “as treated” multiarterial grafting, that study also showed benefit¹⁰). For the clinician, the more compelling concern is how bare the branches still remain for informed decision tree analysis. Specifically which patients are the ones who do and do not derive a survival benefit from BITA grafting? What are the specific measureable elements that define improved survival? What is the time frame and quantity of that benefit? What is the patient-specific risk of DSWI and what is its current “utility” or quantitative measure that would enable balancing DSWI with death? Although much improved, the mortality associated with DSWI remains elevated, and the morbidity of additional procedures and treatments is considerable. What is the impact of different forms of diabetes—adult versus juvenile onset, insulin versus noninsulin dependent? What is the impact of chronic management (hemoglobin A1c) and optimal perioperative glucose management? Future research efforts should focus on providing the answers to these key unresolved issues so that our decision

trees will bloom with patient-specific answers that will provide truly optimal surgical care for this menacing disease.

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