Response to Letter Regarding Article, “Quantification of Incomplete Revascularization and Its Association With Five-Year Mortality in the Synergy Between Percutaneous Coronary Intervention With Taxus and Cardiac Surgery (SYNTAX) Trial: Validation of the Residual SYNTAX Score”

We thank Carnero-Alcázar and colleagues for their comments concerning our article. First, the readership should be reminded that the anatomic Synergy Between Percutaneous Coronary Intervention With Taxus and Cardiac Surgery (SYNTAX) score was designed before the SYNTAX trial as a tool to force the interventional cardiologist and cardiac surgeon to systematically analyze the coronary angiogram and agree that “equivalent anatomic revascularization” could be achieved on the basis of a vessel size of 1.5 mm. A vessel size of 1.5 mm was selected as this was the size of the vessel the cardiac surgeon stated they could revascularize. Before the SYNTAX trial, the SYNTAX score was tested in the Arterial Revascularization Therapies Study (ARTS) II Study. In the SYNTAX trial protocol, outcomes related to the SYNTAX score were prespecified. Since the SYNTAX trial, numerous studies have validated the SYNTAX score.3

Second, criticisms related to the reproducibility of the SYNTAX score appear excessive. The simple interpretation of a coronary angiogram, on which most contemporary revascularization practice is based, has been reported as far back as the 1970s to have substantial intraobserver and interobserver variability in visual estimation (SD up to 18%),3 findings that are simply reflected in the SYNTAX score calculation. Suitable training to undertake the SYNTAX score, quantitative coronary angiography, and functional guidance have been shown to limit this issue.3 A semiautomated, computed tomography–derived functional SYNTAX score is currently in development and is expected to further minimize this concern.3

Third, it is important to highlight that the SYNTAX score II is built on the principle of parsimony. The core factors in the SYNTAX score II (SYNTAX score and ACEF [age, creatinine clearance, and left ventricular ejection fraction]) contain the bulk of the prognostic information for predicting long-term mortality after coronary artery bypass graft surgery or percutaneous coronary intervention.2 The remaining factors added to the SYNTAX score II were based on the principle that they were shown to alter the threshold value of the SYNTAX score (interactions) for equipoise to be achieved between coronary artery bypass graft surgery and percutaneous coronary intervention for long-term mortality, thereby aiding decision making between revascularization modalities. An online calculator to simplify the calculation of the SYNTAX score II is planned for public release shortly (www.syntaxscore.com).

Finally, the authors assert that complete revascularization (CR) is always better. On which definition of CR is this assumption being made? This is particularly pertinent given the multiple definitions of CR that exist in the literature. Although too extensive incomplete revascularization is likely to have a negative impact on long-term clinical outcomes, too extensive surgical revascularization has been associated with the occurrence of major perioperative complications and acute myocardial infarction, with evidence to support a reasonable incomplete revascularization approach.1 Even within the SYNTAX trial, despite CR being mandated by the heart team, the reality was somewhat different, with only 56.7% and 63.2% of the percutaneous coronary intervention and coronary artery bypass graft surgery cohorts, respectively, achieving CR. In addition, CR is a clinical outcome, not a baseline characteristic. Therefore, conducting a randomized trial directly examining this issue is difficult, particularly because incomplete revascularization was shown to be a surrogate marker for sicker patients, with a greater burden and complexity of coronary disease and clinical comorbidity.1

We fully agree that further prospective validation of these SYNTAX-based tools is required to further legitimize their use in clinical practice. This is currently occurring in the ongoing EXCEL (Evaluation of XIENCE PRIME Everolimus Eluting Stent System [EECSS] or XIENCE V® EECSS or XIENCE Xpedition EECSS Versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularization) and SYNTAX II trials investigating unprotected left main and 3-vessel disease, respectively.4

Disclosures

Dr Feldman reported serving on the speaker’s bureau for Boston Scientific; receiving grant support from Abbott, Attriech, BSC, Edwards, and Evolve; and consulting for Abbott, Coherex, Intervale, Square One, and W.L. Gore. Dr Mack has served on the speaker’s bureau for Boston Scientific, Cordis, and Medtronic. Dr Morice reported that her institution has received a research grant from Boston Scientific. Dr Dawkins is a full-time employee of and holds stock in Boston Scientific. The other authors report no conflicts.

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