

EDITORIAL



Coronary Bypass — Survival Benefit in Heart Failure

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Velazquez and colleagues report the outcomes from the 10-year extended follow-up of the surgical revascularization component of the Surgical Treatment for Ischemic Heart Failure (STICH) study.¹ This STICH Extension Study (STICHES) was a tenacious 15-year effort, achieving a 98% rate of follow-up from 99 institutions of 1212 patients with heart failure and severe left ventricular dysfunction who were randomly assigned to receive either medical therapy alone or medical therapy plus coronary-artery bypass grafting (CABG). CABG was found to confer a significant and substantial survival benefit at 10 years, with a rate of death from any cause that was 16% lower than that associated with medical therapy alone (an 8-percentage-point absolute difference in the Kaplan–Meier rate).

Both medical therapy and CABG were well-executed in STICHES, with temporal tracking of excellent guideline-directed medical therapy, 91% use of the internal mammary artery for grafting, and a 30-day CABG-related mortality of 3.6%. Eligible patients were required to have coronary artery disease suitable for CABG, an ejection fraction of 35% or less, and angina of Canadian Cardiovascular Society class II or lower. The median age of the enrolled patients was 60 years, 40% of the patients had diabetes, 77% had had a previous myocardial infarction, and 86% had New York Heart Association class II to III heart failure. The clinical context, the fidelity of execution, and the characteristics of the enrolled patients in STICHES make this study exceptionally relevant to contemporary populations with heart failure. The only notable departure from current therapy was a low rate (18%) of use of implantable cardioverter–defibrillators.

The 2012 guidelines of the American College of Cardiology Foundation and the American Heart Association include a class IIb recommendation for patients with clinical characteristics similar to those of the STICHES patients: “CABG might be considered with the . . . intent of prolonging survival in patients . . . with severe left ventricular dysfunction (EF [ejection fraction] <35%) whether or not viable myocardium is present.”² This recommendation was based in large part on the 5-year STICH results, which did not show a significant benefit of CABG with regard to all-cause mortality. The STICHES 10-year data solidly support a class IIa recommendation that CABG is “probably beneficial” in these patients. The issue of viability was considered in a subgroup of patients in the STICH study, and no interaction was found between viability and the benefit of CABG.³

The authors appropriately emphasize that this trial was not designed to evaluate the use of percutaneous coronary intervention in these patients. There is no evidence that percutaneous coronary intervention prolongs survival in patients with clinical characteristics similar to those of the patients enrolled in STICHES.

The results of this trial should change our clinical approach to patients with heart failure. Early identification of a possible ischemic cause for left ventricular systolic dysfunction should be pursued with the potential of improving long-term survival through CABG. Among the patients in STICHES, there was a compelling 1.4-year median extension of survival. In patients whose condition is suitable for coronary bypass, a discussion of the benefits observed in STICHES should be included in the model of shared deci-

sion-making among the cardiologist, the cardiac surgeon, and the patient.

The shared decision-making discussion should be patient-specific. For each patient, an appropriate tension exists between the durable long-term benefit of CABG and the early mortality associated with the intervention, and patient-specific factors inform the estimates of early mortality. A patient with few risk factors — for example, age 60 years, an ejection fraction of 30%, and NYHA class III heart failure — would have a predicted risk of CABG-related death of 0.7% calculated with the use of the Society of Thoracic Surgeons (STS) risk calculator (<http://riskcalc.sts.org/stswebriskcalc/#/calculate>), as compared with the 3.6% mean mortality found in STICH, which makes the choice of CABG extremely compelling. A different patient, with several major risk factors — for example, age 70 years, previous CABG, an ejection fraction of 30%, moderate mitral regurgitation, a creatinine level of 2.4 mg per deciliter, and NYHA class III heart failure — would have an STS-predicted risk of death in excess of 7%, which would make the decision more difficult. The presence of more advanced coronary artery disease and diabetes tends to shift the patient-specific risk–benefit analysis in favor of CABG. It is this patient-specific risk–benefit analysis that is the essence of shared decision making. The patient-specific relevance of the studies that form the evidence base for a given therapy should be discussed with the patient within the framework

of local resources and outcomes, the patient's co-existing conditions, and social and psychological considerations.

The STICHES 10-year results firmly extend the survival benefit of CABG in patients with advanced coronary artery disease to patients with heart failure and severe ischemic cardiomyopathy. These findings should prompt strong consideration of coronary bypass as an addition to medical therapy in shared decision making with these patients.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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