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Commentary: Succeeding to prepare and preparing to succeed

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In this issue of the *Journal*, Coselli and colleagues¹ report the results of proximal and arch aortic operations in patients who have undergone isolated previous coronary artery bypass grafting (CABG). While cardioaortic reoperations typically are greater risk than first-time operations, historically these risks simply have been acknowledged and consciously accepted, due to reoperations being the only available therapeutic options. However, with the application of endovascular approaches extending further proximally within the aorta, the benefits and risks of open approaches in the reoperative setting must be studied and interpreted in the context of catheter-based approaches. With this stated motivation in mind, the authors conducted their study.

The results are impressive. Nearly 3000 patients underwent proximal/arch aortic operations over approximately 20 years. Within this group, propensity-matched subset pairs of 252 patients (126 who previously underwent CABG, 126 who did not) were obtained. Operative and hospital mortality were 15.9% and 13.5% in the patients with a history of previous CABG, in contrast to 11.1% and 7.1% in the patients without a history of previous CABG; these were not statistically significant differences. With respect to morbid postoperative complications, the incidences of stroke were 6.3% versus 4.8%, and the incidences of renal failure were 7.9% and 4.0%, respectively, in the 2 groups; these also were not statistically significant differences.

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CENTRAL MESSAGE

Methodical preparation for complex cardiac operations is the foundation upon which the best outcomes are built.

The propensity-matched patients were notably high-risk. Approximately 45% of patients underwent urgent or emergent operations, and consistent with this, ~30% of patients underwent operations for acute type A aortic dissection. Finally, some operative differences were present between the propensity-matched subgroups. Patients without a previous history of CABG underwent more extensive aortic operations (28.6% underwent aortic root replacement and 23.8% underwent total arch replacement, in contrast to 9.5% and 11.1%, respectively, in those patients with a previous CABG history). However, patients with a previous history of CABG, certainly unsurprisingly, underwent concomitant reoperative CABG at much greater rates (31.7%, as opposed to 4.8% in patients without a previous history of CABG).

In learning from a study with excellent results such as these, it is perhaps most important to identify the ingredients for success. In the case of this study, Dr Coselli's group has provided some important guidance. Coronary angiographic and thoracic computerized tomographic assessments were essential components of preoperative evaluation. Axillary or innominate arterial cannulation generally was employed, with the former being the preferred strategy in redo cases with aortic, bypass graft, or cardiac proximity to the sternum. Pre-sternotomy initiation of cardiopulmonary bypass and profound systemic hypothermia to 18°C-20°C was undertaken in cases of aortic proximity to the sternum, and saphenous vein harvesting was performed while preparing to open the sternum in patients with retrosternal patent left internal mammary artery bypass grafts. Cerebral protection was achieved using antegrade cerebral perfusion (ACP), typically under moderate systemic hypothermia (~24°C),

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with evolution from selective right-sided ACP via the right axillary or innominate artery, to routine bilateral ACP. Myocardial protection and management of patent in situ internal mammary arterial grafts was generally in keeping with common practices.

Each of the aforementioned practices is part of a systematic approach to prevention—and preparation for management, should it be needed—of adverse events. That is to say, extensive and thoughtful preparations

were made to tackle challenging cases. To borrow from and modify Benjamin Franklin's quip, this study illustrates that "succeeding to prepare is preparing to succeed."

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Commentary: Is combining two high risk too high risk?

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The impact of previous open-heart surgery on the expected outcome of a subsequent open-heart procedure is well characterized and well recognized by surgeons.¹ The risk of injury to patent grafts and the challenges of myocardial protection can make previous CABG uniquely problematic. Clinical data have corroborated these concerns.^{2,3} Over the last decade, the operative risks associated with previous heart operation have persisted as the risk profile of those undergoing reoperation has increased.^{4,5}

In this edition of *the Journal*, the group from Baylor draws upon their vast experience to quantitate the impact of previous CABG on proximal aortic surgery.⁶ They compare a group with previous CABG who underwent proximal aortic surgery with a propensity-matched group undergoing proximal aortic surgery without previous CABG. Previous CABG provides a unique problem for planning surgery of the ascending aorta, as proximal coronary bypass grafts are

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CENTRAL MESSAGE

In expert hands, previous CABG does not increase the risk of proximal aortic surgery, but the devil still lies in the details.

most commonly anastomosed to the ascending aorta. The authors' data present a trend toward greater rates of operative mortality, 30-day mortality, and stroke but do not achieve statistical significance. The rates are similar to other case series.⁷ The rates of reoperation for bleeding and pericardial effusion requiring drainage, 2 common concerns for reoperative surgery, were no different between groups. The only significant difference between groups was the use of intra-aortic balloon pump. This likely relates to the difficulties of cardiac protection in the setting of a patent left internal mammary artery. Nevertheless, this did not result in a significant difference in mortality. Although falling just short of statistical significance ($P = .06$), there was a trend toward an improved (nearly double) 10-year survival among the patients without CABG. Any difference here likely represents unaccounted comorbidities. The heterogeneity of procedures performed in this study is important to consider. The impact of a previous CABG on a hemiarch with root repair versus an arch repair is clearly different. The rubric of aortic procedure versus previous CABG anatomy results in many variations with too few cases

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