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Commentary: Redo cardiac surgery: Striving for the best but prepared for the worst

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CENTRAL MESSAGE

Purposeful preoperative planning and use of the multidisciplinary heart team may help reduce the surgical risks associated with reoperative cardiac surgery to levels comparable with primary surgery.

The increased morbidity and mortality associated with reoperative cardiac surgery are well documented by single-center experiences. More recently, an adjusted analysis of propensity-matched cohorts by Bianco and colleagues[1] demonstrated a significant increase in operative mortality (8.37% vs 6.07%) and associated excess mortality at 30 days (hazard ratio [HR], 1.36), 1 year (HR, 1.3), and 5 years (HR, 1.3) among propensity-matched cohorts. Similar findings exist in the redo coronary bypass, valvular, and aortic surgical populations.[2-4] As surgeons continue to face an increasing number of redo operations in often older patients, whether due to increased life expectancy or changes to surgical recommendations and patient preferences (ie, increasing use of bioprosthetic valves among younger patients[5]), it is critical for surgeons to have a thorough understanding of reoperative risks and outcomes.

In this issue of the *Journal*, Kindzelski and colleagues[6] describe their outcomes in reoperative cardiac surgery with prior sternotomy among 6627 patients, excluding those undergoing heart transplant or endovascular stenting of the thoracic aorta. The investigation's focus is outcomes based, with particular attention drawn to the utility of cardiopulmonary bypass (CPB) initiation before (early) or after (late) redo sternotomy, generally on the basis of operative risk screening. The cohort was stratified into 755 versus 5872 patients who received early versus late CPB, respectively, and each group subclassified to high versus low risk reentry based on the following criteria: sternal adherence of bypass grafts crossing midline, ascending aorta adherence to the sternum, and pseudoaneurysm in close proximity to the sternum. In both the high- and low-risk surgical groups, there was no difference in propensity-weighted operative mortality and long-term survival among patients who received an early or late CPB strategy.[6]

Foremost, the authors should be commended for their excellent outcomes, having achieved 3.5% all-comer mortality. However, this result should be interpreted in the context of this institution's experience, having completed more than 7500 redo operations in less than 10 years, or approximately 750 redo operations annually, with more than 18% re-redo operations. The conclusion that reoperation does not confer increased procedural risk is likely generalizable to large-volume, highly experienced centers. This group has improved on the 4.5% mortality reported in their 2008 cohort,[7] which demonstrates the effectiveness of continuous quality improvement and evidences a potential pathway forward toward reducing surgical risk with reoperation that may be generalizable to a greater number of surgical centers.

The authors highlight the importance of implementing preoperative screening protocols to evaluate perioperative

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risk and use of the heart team model. All patients received preoperative contrast-enhanced computed tomography when possible (if not, then noncontrast) to evaluate the risk of sternal reentry and operative approach, and complex cases were reviewed by a multidisciplinary heart team. This ensures that the current range of surgical options can be explored. The heart team should maintain regularly scheduled conferences to screen complex cases for operative risk, and it is important that decisions are based not only on literature-based evidence but also on patient choices and institutional experience.

Recent cohort studies from several jurisdictions have suggested that valve-in-valve is a lower risk strategy than redo aortic valve replacement for failing bioprostheses, at least for moderate-risk patients.[8-10] Kindzelski and colleagues[6] instead maintain that prior sternotomy in and of itself should not be an automatic indication to defer to a more minimally invasive surgical approach. Rather, multidisciplinary heart teams should comprehensively risk stratify patients to optimize outcomes, and decisions should consider local expertise.

Although the choice of instituting early versus late CPB likely can be left to the operating surgeon on a case-by-case, risk-stratified basis, Kindzelski and colleagues[6] highlight the importance of preoperative planning and preparedness while encouraging the cardiac surgical community that redo surgery can consistently result in a positive outcomes and may trend toward outcomes similar to primary surgery.

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