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Commentary: Tricuspid valve disease at the time of surgical aortic valve replacement: Treat it or leave it?

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Current recommendations from guidelines of the American Heart Association/American College of Cardiology and European Society of Cardiology/European Association of Cardiothoracic Surgery reflect the limited evidence from well-controlled trials supporting a more early and aggressive surgical treatment of functional tricuspid regurgitation (TR).^{1,2} Accumulating data from recent observational studies almost uniformly underscore the adverse clinical prognosis of patients with relevant TR and even show that the disease often persists or even progresses after successful correction of mitral or aortic valve disease, including transcatheter aortic valve replacement.³⁻⁵

Indeed, moderate to severe TR was found to be linked to a substantial increase of mortality in more than 20,000 patients undergoing cardiac surgery over a 24-year follow-up period.⁶ These findings have fired a controversial discussion among experts, and some support a more liberal indication for tricuspid valve surgery (TVS) at the time of left-sided valve surgery. The term “left-sided” valve surgery

CENTRAL MESSAGE

This retrospective analysis of the STS database sought to determine the evidence for a more aggressive operative strategy for concomitant tricuspid valve disease at the time of aortic valve replacement.

includes 2 different pathophysiologic entities of TR, with mitral valve regurgitation and aortic valve stenosis being the most common. An analysis of the Society of Thoracic Surgeons (STS) database, which included 50,000 patients undergoing TVS between 2000 and 2010, demonstrated that 86% of tricuspid valve procedures were performed at the time of left-sided valve surgery.⁷ The most common concomitant procedure in the STS database report was mitral valve surgery with approximately 79% of all cases, whereas aortic valve replacement (AVR) alone at the time of TVS was performed in less than 10% of all patients. Consequently, current recommendation for TVS are largely based on patient cohorts with concomitant mitral disease and it is unclear whether TR in the presence of aortic disease should be addressed in a similar way.^{3,6,7}

In this issue of the *Journal*, Chancellor and co-workers⁸ report operative outcomes based on a retrospective analysis

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of a regional STS database that included 17,000 patients who underwent AVR for aortic stenosis in 19 cardiac surgery centers between 2001 and 2017.⁸ Forty-one percent of patients had mild TR at the time of AVR, and the incidence of moderate and severe TR was 6% and 1%, respectively. Only 0.6% of patients underwent concomitant TVS, predominantly in the presence of severe TR (31%) at the time of surgery. As expected from previous reports,^{6,7} increasing severity of TR was associated with an increasing operative mortality that was 2-fold or 4-fold higher for patients with moderate or severe TR when compared with patients without TR. Surgical correction of TR significantly increased early mortality and morbidity when compared to patients who had isolated AVR alone (15% vs 4%), independently of the severity of TR. Finally, adjustment for confounding variables, such as concomitant coronary artery bypass grafting, resulted in comparable operative outcomes, whereas operative mortality did reach statistical difference after propensity score matching.

Several important aspects and limitations should be considered when interpreting the results presented by Chancellor and coworkers.⁸ In contrast to current guidelines and previous reports from the STS database, surgery for moderate and especially severe TR was strongly underused in the current patient cohort. Although the authors can only speculate about the exact reasons this observation together with the retrospective design of this study does not allow a conclusive interpretation of their outcome data and the best surgical strategy for patients with aortic stenosis and relevant TR. In addition, the attempt to adjust patients with or without concomitant TVS by propensity score matching resulted in only 55 matched pairs, a sample size that is clearly underpowered to allow a robust interpretation of the results. Furthermore, important preoperative variables that determine the etiology and prognosis of tricuspid

valve disease, such as right ventricular function, pulmonary hypertension, annular dimension before surgery, and residual TR after operative correction, were not obtained. The aforementioned limitations are well acknowledged within the study and do not reduce the importance of the present work. Instead, the authors can be congratulated for focusing on this relevant and important topic that up to now has not received adequate attention in the cardiac surgery community. Further studies will be needed to evaluate the benefits of concomitant TVS on long-term outcome in patients undergoing AVR.

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