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Commentary: Moderate aortic regurgitation at the time of surgery: Just *don't* do it

Dimitri Kalavrouziotis, MD, FRCSC, and
Siamak Mohammadi, MD, FRCSC

Siamak Mohammadi, MD, FRCSC, and Dimitri Kalavrouziotis, MD, FRCSC

Aortic valve (AV) repair or replacement for moderate aortic regurgitation (AR) is a reasonable option (class IIa) in patients undergoing cardiac surgery for indications other than the AV in the latest iteration of the guidelines of the American College of Cardiology/American Heart Association.¹ On the other side of the pond, this recommendation is slightly less enthusiastic, and AV intervention in this setting is largely dictated by the status of the aortic root and ascending aorta.² Guidelines were essentially based on expert opinion and informed by a sparse literature showing that progression of AR is rare in the absence of significant AV leaflet pathology and aortic root or ascending aortic dilation.³

In this issue of the *Journal*, Ward and colleagues⁴ attempt to determine the prevalence and progression of moderate AR in a cohort of patients referred for coronary artery bypass graft surgery (CABG), mitral valve surgery, and aortic aneurysm repair in a single-center retrospective dataset. The prevalence of moderate AR was low ($n = 138$ of 3289 patients; 4.2%); approximately one-third of the patients were treated with either AV repair or AV replacement without an increase in operative risk, while the remaining patients with moderate AR had no intervention on the AV. At a median follow-up of 6 years, a greater severity of preoperative AR was associated with diminished late survival. However, the progression to $>2+$ AR was extremely rare ($<3\%$), as was the rate of late reoperation. These findings

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Most moderate aortic regurgitation at the time of cardiac surgery can be left alone, although the determinants of progression need to be elucidated using an integrated imaging approach at follow-up.

were similar after risk adjustment using propensity scores. The curves showing the late freedom from $>2+$ AR and AV intervention were largely superimposable when patients were stratified according to severity of preoperative AR. The authors concluded that repairing or replacing the AV for moderate AR at the time of cardiac surgery for other indications is safe. However, leaving the AV alone is also a defensible position, as there is no late mortality impact, and progression to more severe AR is the exception rather than the rule.

The study is laudable for including late echocardiographic data, as the sole reliance on clinical data (eg, late death, reoperation) as a surrogate for longitudinal outcome analysis may underestimate the true risk of progression of valvular disease. However, the likelihood of finding AR depends on how hard one looks for AR. It is unclear whether late echocardiography was performed at the authors' institution or in less experienced centers and whether transesophageal echocardiography was used in equivocal cases. The extent to which semiquantitative (eg, vena contracta width, pressure half-time) and quantitative (eg, effective regurgitant orifice area, regurgitant volume) echocardiographic parameters were considered also is not stated. If the echocardiographic measurements are suboptimal, an integrated approach using cardiac magnetic resonance imaging can provide an accurate

From the Division of Cardiac Surgery, Quebec Heart and Lung Institute, Quebec City, Quebec, Canada

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Address for reprints: Siamak Mohammadi, MD, FRCSC, Division of Cardiac Surgery, Quebec Heart and Lung Institute, 2725 chemin Sainte-Foy, Quebec City, QC, Canada, G1V 4G5 (E-mail: siamak.mohammadi@fmed.ulaval.ca).

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assessment of regurgitant volume and fraction, and it has the added benefit of measuring left ventricular volume and systolic function along with AV morphology. Unfortunately, this dimension was not explored by the authors. Another limitation of the study is the heterogeneity of the patient population, as CABG patients were included alongside mitral valve surgery patients and aortic aneurysm repair patients. It is not surprising that the likelihood of intervening on the AV is influenced by whether the surgeon plans on opening the cardiac chambers; CABG patients had a significantly higher probability of leaving the operating room without AV intervention.

There are other factors that clearly influence the decision to intervene on the AV, as reported by the authors, who showed an increased probability of repairing or replacing the AV in the presence of leaflet abnormalities (eg, bicuspid AV, rheumatic valve disease). However, the study lacks granularity with respect to the mechanism of AR, especially in the patients without ascending aortic or root disease, and although centricity of the jet was reported, no data are provided on the functional anatomic aspects of the AV.⁵ A combination of integrated comprehensive imaging and a nuanced anatomic functional description of AV dysfunction may have allowed for the elaboration of an algorithm for the management of moderate AR during cardiac surgery (similar to that used for the assessment and management of mitral

regurgitation), and would have greatly enhanced the quality of the study.

Ultimately, the decision to repair/replace or leave the AV alone was made by the operating surgeon, and no amount of multivariable analysis can adjust out the confounding associated with the “individual surgeon” variable. The study by Ward and colleagues, although unlikely to influence current clinical practice guidelines, demonstrates that patient selection is crucial, and that excellent early and late results can be achieved when the right procedure is performed on the right patient.

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