relevance of the present work beyond its acute hemodynamic setup. Nonetheless, Jazwiec and colleagues[6] can be congratulated for their efforts in highlighting an important and emerging area of cardiac surgery.

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# Commentary: Addressing tricuspid annular dilation: Cinch it down but not too tight

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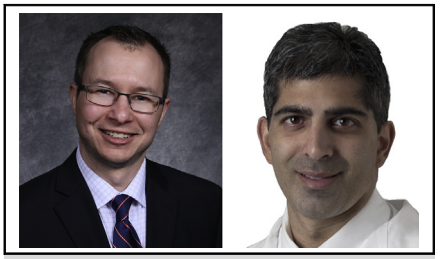

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**CENTRAL MESSAGE**

In a large-animal model, moderate (~50%) rather than aggressive annular reduction was optimal correction for functional tricuspid regurgitation while preserving right ventricular function.

Reaching consensus today on the optimal management of functional tricuspid regurgitation (FTR) is an unlikely endeavor. The tricuspid valve, no longer forgotten, still remains understudied, with surgical technique, patient selection, and indications still debated. Often the result of left-sided heart disease, FTR is a complex pathophysiology that occurs in the setting of varying degrees of pulmonary artery hypertension, right ventricular (RV) dysfunction, annular dilation, and leaflet tethering associated with left ventricular dysfunction.[1]

Jazwiec and colleagues[2] should be commended for investigating the complex interaction between tricuspid annular dilation and RV dilation with varying degrees of tricuspid annular reduction. Using a large-animal ovine model of tachycardia-induced cardiomyopathy, the authors identified moderate annular reduction (~50%) as the optimal correction for FTR that improves valvular function while not compromising RV function. This study is a follow-up to their previous work in healthy sheep, where they identified

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Disclosures: Authors have nothing to disclose with regard to commercial support.
Received for publication Nov 29, 2019; revisions received Nov 29, 2019; accepted for publication Nov 30, 2019; available ahead of print Dec 14, 2019.

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J Thorac Cardiovasc Surg 2021;161:e288-9
0022-5223/$36.00



https://doi.org/10.1016/j.jtcvs.2019.11.117

tricuspid annular reduction exceeding 50% as having a detrimental effect on RV myocardial performance.[3]

Guidelines for concomitant tricuspid valve (TV) repair during left-sided heart surgery are an active area of clinical investigation, with reluctance among some clinicians to perform TV interventions due to increased risk of perioperative mortality, pacemaker use, and unknown effect of correction of left-sided disease on residual tricuspid regurgitation.[4,5] Isolated TV repair is even more infrequently performed; however, the landscape for the management of tricuspid regurgitation is rapidly changing due to percutaneous transcatheter options, such as the TriClip (off-label use of MitraClip [Abbott, Santa Clara, Calif]).[5-7] With an increasing focus on treating the TV, it is prudent for us to further understand effective techniques for valve modulation using translational animal studies. Identifying the optimal degree of tricuspid annular reduction, and its effect on RV geometry and function, is an important aspect of the management of FTR that Jazwiec and colleagues have been addressing with their work.[1,8,9]

The strengths of this study were the rigorous experimental protocol, the large-animal model, and the comprehensive data acquisition, including hemodynamics, echocardiographic data, and sonomicrometric data. Although the findings of this study improve our understanding of the interplay between tricuspid annular reduction and RV function, there are many important limitations. Sample size was small, and only aggressive annular reduction resulted in significantly decreased FTR. Data collection was performed in open-chested animals at 30 minutes after weaning from bypass. Since FTR is highly dependent on volume status, closing the chests and following their echocardiogram over a longer period of time are necessary next steps. In addition, the authors used a DeVega-like progressive suture annuloplasty, which is not consistent with current clinical practice.

Overall, this is an interesting study that investigates a complex problem with highly interdependent anatomy and geometry between both ventricles, septum, and TV. This study demonstrates that downsizing annuloplasty may not be effective alone for the management of FTR and sets the groundwork for future studies. With clinically relevant translational research studies such as this one, we may one day put the issue of how to best manage FTR to bed.

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