

Tricuspid valve annulus surgery during mitral valve surgery

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Tricuspid valve repair at the time of mitral valve surgery is a contemporary topic faced by cardiac surgeons routinely. We and our cardiologist as well as anesthesiologist echocardiographers share the common debate about what to do with leaking tricuspid valve during mitral valve surgery. The Study by Popal *et al.* (1) reviews a single institution dataset with tricuspid annulus circumference index of 80 mm/m² as a new additional metric to sway the surgeon to repair the tricuspid valve as well. Currently repair metric cutoffs include a 40 mm tricuspid valve annulus (2) diameter or intraoperative maximal tricuspid diameter greater than 70 mm (3). This new metric by Popal *et al.* is a fine addition to the above metrics provided by committee guidelines reviewing different levels of data evidence and published by major societal organizations. These published metrics recommend that the tricuspid valve annulus be intervened based on function (i.e., degree of tricuspid valve regurgitation), diameter size, significant right ventricular dilation or dysfunction. Given these guidelines, current practicing surgeons differ in their approach to intervene on tricuspid valve at the time of mitral valve surgery. While some find it beneficial with perhaps lack of less than robust long-term data supporting their practice (4), others are less likely to intervene (5,6).

When there is more than one way to answer a vexing question, perhaps this suggests that the problem is not well defined. In the context of this free spirit editorial for the *Journal of Thoracic Surgery* a frequent quotation by Albert Einstein cinches the debate along the lines of—“*If I had an hour to solve a problem I'd spend 55 minutes thinking about the problem and 5 minutes thinking about solutions.*” This advice is perhaps one that is most useful as we surgeons lack the

boundless time in the operating room to define the problem at hand compounded by potentially longer cardiopulmonary bypass and cross clamp time in our aging population. Nonetheless, the more we spend time understanding a problem outside the operating room, the more effective the resolution and lesion targeted tools can potentially be. The root of these various and myriad therapeutic interventions for a lesion such as tricuspid valve disease we face perhaps can be lack of understanding the problem with tricuspid valve annulus properly. As the readers and authors of this article acknowledge, the tricuspid valve is hard to study because of its geometry, its sensitivity to the right ventricular hemodynamics and the intrinsic dynamism of the tricuspid valve. To this date, when the tricuspid valve is dysfunctional, we lack rigorous biomarkers (if the tricuspid valve leaflets, subvalvular apparatus, annulus) that can tell the surgeon the degree of injury-reversibility. We surgeons need to know if the tricuspid annulus at the time of surgery will continue to dilate despite fixing the mitral valve (7,8) (i.e., irreversible injury). Or will it regress or will stabilize (i.e., reversible injury) (5,6). One could argue this is the root of the problem herein, and perhaps the root of the problem we surgeons face in many aspects of our patient pathophysiological presentations such as deciphering what tricuspid to intervene on and which paper/guidelines to follow. In my practice, I address the tricuspid valve at the time of degenerative mitral valve surgery when it is leaking due to annulus dilatation associated with either significant pulmonary hypertension and or right ventricular dilatation and essentially following Class I and IIa guidelines) (2). Understanding the guidelines to repairing the tricuspid valve should be no different than any other valve. However,

we are confronted with worse tricuspid valve surgery outcomes per published data when patients present many years following the index mitral valve surgery (9). This brings me to the second major issue herein related to the problem addressed, is tricuspid valve insufficiency at the time of degenerative mitral valve surgery a degenerative problem too and independent of the mitral valve or is it related to a right ventricular problem and or the fibrous skeleton of the heart. We do not know the answers to these questions and until we have clear objective markers (biological, metric, strain/stress) to demonstrate the extent of the tricuspid valve recoil and reversibility we can only use guidelines and our personal experience to support tricuspid repair in concomitant left sided cardiac surgery. The good news is that repairing tricuspid valve annulus is less challenging than mitral valve repair in general. This debate will continue as long as we use solutions to guide the problem as opposed to defining the problem first properly. Nonetheless, the paper published in the journal *Today* (1) adds more evidence of favoring fixing a severely dilated tricuspid annulus.

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Footnote

Conflicts of Interest: The author has no conflicts of interest to declare.

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