Redefining tricuspid valve anatomy: Acknowledging the “forgotten valve”

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With accumulating evidence that concomitant repair of significant functional tricuspid regurgitation (TR) associated with degenerative mitral insufficiency confers significant benefit in terms of medium- and long-term patient survival¹ and right ventricular remodeling,² the once “forgotten valve” has garnered increasing attention and investigation. Interestingly, alternatives to the long-held notion that functional TR primarily results from right ventricular remodeling stemming from altered left-side hemodynamics are being considered. Navia and colleagues³ report evidence that, in some patients, tricuspid insufficiency accompanying ischemic mitral insufficiency may be a direct consequence of right ventricular ischemic disease, “ischemic TR,” with relatively high recurrence rates mirroring those seen after annuloplasty repair of ischemic mitral insufficiency. Current rates of recurrent TR, ranging from 10% to 30%,⁴ have prompted several studies comparing repair techniques, particularly suture annuloplasty (DeVega) versus ring annuloplasty. Although most studies suggest that less recurrence is seen with ring annuloplasty,^{4,5} there is still debate as to whether rigid versus flexible annuloplasty bands are advantageous^{6,7} and what benefits, if any, nonplanar band configurations confer to tricuspid repair. Moreover, objective indications for concomitant tricuspid repair are being redefined,⁸ focusing on tricuspid regurgitant severity, annular dimensions, and mode of leaflet coaptation as primary indices.

As with the mitral valve, analysis of tricuspid dysfunction has extended beyond simply attributing TR to annular dilatation to scrutinizing the role of the subvalvular apparatus. With this and increasing investigation of the significance of TR as a backdrop, Kawada and colleagues⁹ have painstakingly redefined and standardized the surgical anatomy and taxonomy of the tricuspid valve to foster more precise techniques in performing tricuspid annuloplasty. The backbone of this work is the precise definition of the anteroseptal, posteroseptal, and anteroposterior commissural points in relation to the primary chordal attachments to the septal and anterior

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Central Message

A more concise redefinition of tricuspid valve surgical anatomy may lead to more precise techniques in performing tricuspid annuloplasty and refinements in tricuspid annuloplasty band design.

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leaflets. In addition to standardizing the definition of these commissural locations, including in the flaccid heart during cardiomy, it facilitates more precise definition of the anatomically variable posterior leaflet. Kawada and colleagues⁹ postulate that the heretofore imprecise identification of the posterior leaflet may lead to excess tension of sutures anchoring the annuloplasty band along the annular segments along the septal and posterior leaflet hinges, leading to ring dehiscence (particularly with rigid rings). With this more precise definition of annular-leaflet transition points, tricuspid annular enlargement seems to occur predominantly along the posterior leaflet, given that it is continuous with the right ventricular free wall and less structurally buttressed than the other annular segments that are in continuity with the interventricular septum and septal commissure.

Finally, in addition to contributing to more precise annuloplasty technique, the results of this analysis could lead to improved tricuspid annuloplasty ring design. At the very least, band markers used to guide suture placement and ring orientation, currently intended as only approximations, can be more precisely located on the basis of these more anatomically consistent definitions. Furthermore, new ring configurations designed to more specifically prevent annular dilatation along the posterior leaflet and interact more favorably with the subvalvular

apparatus may reduce TR recurrence rates. The authors should be congratulated on this important contribution.

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