Too big will fail? The enlarged tricuspid annulus

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The normally oblong TV annulus is more circular in functional tricuspid regurgitation.

Central Message

Controversy exists regarding level IIa guideline recommendations for repair of tricuspid valves with annulus of at least 40 mm and mild or less tricuspid regurgitation during left-side valve surgery.

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The normal tricuspid valve (TV) diameter is 31 mm in end-diastole (3.15 ± 0.43 mm in men and 3.01 ± 0.47 mm in women; indexed for body surface area, 1.59 ± 0.22 mm/m² and 1.70 ± 0.27 mm/m², respectively).¹ The 95th percentile for the upper margin is 39 mm in both men and women. Our guidelines tell us that we should (class IIa recommendation) repair the TV during mitral repair if it is larger than 40 mm in end-diastolic diameter (top 5% of normal) or larger than 21 mm/m² indexed, even if the tricuspid regurgitation (TR) is mild or less.^{2,3} In this issue of the *Journal*, David and colleagues⁴ successfully challenge that assertion. Frater⁵ pointed out that TR is dynamic and previously moderate or severe TR may appear only mild in the OR, and he suggested repair if there are prior episodes of right heart failure.⁵ The guidelines add pulmonary hypertension to the clinical factors to consider, and emerging data would indicate that atrial fibrillation may cause valve regurgitation.^{3,6} As surgeons we can understand the logic behind these clinical pearls of wisdom.

But should we “repair” a valve that does not leak simply because it is dilated? Data indicate that for men the normal ascending aorta is 29 ± 4 mm, and the 75th percentile is 32 mm.⁷ Should we replace all aortas larger than 40 mm? Late aortic dissection is more of a catastrophe than late progressive TR. David and colleagues⁴ have been conservative about treating patients with mild TR and annular dilation and report in this experience that it is rarely a serious clinical problem. The skepticism arises from the low cutoff value of 40 mm. Maybe the cutoff should have been 45 mm, or 50 mm? Dreyfus and colleagues⁸ reported more TR and worse New York Heart Association functional class in patients with unrepaired TV annuli compared with those with diameters of 70 mm or more (measured from the septal-anterior to anterior-posterior commissure) who underwent a repair.⁸ It is reported that this 70 mm corresponds to 40 mm as measured by echocardiography (apical 4-chamber view).⁹ As the TV dilates, it transforms

from an oblong to more circular shape, so the discrepancy should not be that large.¹⁰ In addition, 70 mm dilation is huge. At Northwestern, we measure the distance with calipers in patients needing TV repair, and it averages 46 ± 7 mm. The largest we have measured in 356 patients is 65 mm. Correlation with echocardiographic measurements is typically accurate within 5 mm.

The ongoing CTSNet randomized trial (Evaluating the Benefit of Concurrent Tricuspid Valve Repair During Mitral Surgery, NCT02675244) will tell us more, but it combines those with moderate TR and symptoms with the group in question in this report. Hopefully we can pick out the subset of patients with no symptoms from TR and only a dilated annulus as the indication for repair, and that we will have enough patients and follow-up from the study to draw conclusions. One can predict that if you put a ring around every dilated TV annulus, you will see less late TR on echocardiography in that treated group. Will there be a price to adding TV surgery, such as more pacemakers? In the control group, will late moderate TR lead to mortality, decrease in quality of life, other morbidities such as renal or liver dysfunction, or the need for late TR intervention with traditional surgery or new transcatheter techniques? Or will it be well tolerated? The data from David and colleagues⁴ cannot be considered to be definitive in this sense, but it looks as though the late clinical problems will be unusual.

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