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Commentary: Treating tricuspid regurgitation: Too much too early or too little too late. Can we find the right balance?

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Surgical tricuspid valve repair had been shown to be safe (no added mortality) and effective when performed at the time of concomitant mitral valve interventions.^{1,2} However, the indications and precise timing of interventions for isolated tricuspid regurgitation (TR) remain to be defined. The tricuspid valve is now the subject of intense renewed interest, prompted by increased recognition that TR is common, frequently clinically silent for years, but its presence is far from benign and associated with a worse prognosis.²⁻⁴ Better awareness, more precise imaging and quantitation, and a growing spectrum of open surgical as well as catheter-based technologies also refocused this growing interest.

In this issue of the *Journal*, Fröjd and colleagues⁵ published their experience of the management of TR by comparing 2 time periods, 1989 to 2005 and 2006 to 2015. The study is limited by its small size, inherent selection bias of retrospective studies, and unmeasured confounders such as right ventricular ejection fraction and the presence/degree of pulmonary hypertension. Like others, the authors demonstrated that the incidence of interventions increased, mortality decreased (and was better for lower TR grades), and 5-year survival improved in the most recent era with more repairs being performed. This is attributed to earlier surgery, better patient selection, and improved medical management of right heart failure. As expected, the vast majority of TR interventions were done concomitantly with other cardiac surgery procedures (89%, with less than 3 isolated TR interventions per year). The authors suggest that

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CENTRAL MESSAGE

The tricuspid valve regurgitation (TR) is the subject of renewed interest but timing, extent, and effectiveness of treatment strategies (particularly for isolated TR) remain to be defined.

these improved outcomes should prompt consideration for earlier therapy of TR (before onset of right ventricular failure, chronic atrial fibrillation, hepatic or renal dysfunction). These updated procedural and survival outcomes should be the benchmarks for comparison for emerging catheter-based interventions.

While we applaud and support these conceptual suggestions, we have to acknowledge that although earlier interventions would be associated with lower morbidity and mortality (like those for aortic and mitral valve insufficiency pathologies), there is a paucity of prospective randomized data to support interventions at clinically earlier (silent) stages of tricuspid valve pathology, particularly for secondary TR. On the other end of the spectrum, it is unclear whether late interventions for secondary TR in the presence of significant RV dysfunction are simply too little, too late and result in only modest transient symptomatic functional improvements with little impact on longer-term survival. There is a concern that with longer follow-up, simple interventions such as ring annuloplasty may not fully protect against residual or recurrent late TR.⁶ Similarly, bioprosthetic tricuspid valve replacement will be associated with a late reoperation due to eventual structural valve deterioration.⁷ With the advances in transcatheter tricuspid technology, the need for reoperative surgery can be mitigated by tricuspid clips, valve-in-ring, and valve-in-valve approaches.

We hope that with their more accurate and complete diagnostic assessments and quantification, studies of new transcatheter tricuspid valve therapeutic technologies will provide clarity, accelerate, and guide ongoing debates by

heart valve teams on the timing and scope of intervention(s) for individual patients at specific presentations and stages of TR, striving to a long-overdue, more effective clinical balance.⁶

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