

# Commentary: Progression of Tricuspid Regurgitation Following Aortic Valve Replacement: Risk Factors, Considerations, and Debates on Prophylactic Repair

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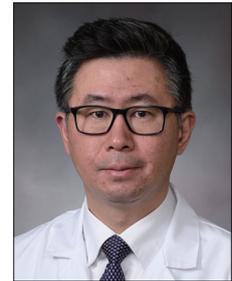
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Clinical practice guidelines do not offer clear recommendations regarding when to correct tricuspid regurgitation (TR) in the context of aortic stenosis without mitral disease. Although the American Heart Association/American College of Cardiology provides a Class I recommendation to repair severe TR at the time of left-sided valve disease and a Class IIa recommendation to repair progressive TR with tricuspid annular dilation or prior signs and symptoms of right-sided heart failure [1], they do not provide specific data on indications for surgery or optimal intervention timing for patients with isolated severe TR. The lack of high-quality randomized controlled trials and contemporary observational studies examining management strategies for isolated TR means that clinical referrals for surgical repair were left to the discretion of treating physicians, potentially leading to poor outcomes in the context of delayed referral, advanced heart failure symptoms, and right ventricular dysfunction. Adding to these controversial issues, the occurrence of significant TR following isolated aortic valve replacement (AVR) has emerged as a subject of growing interest. Several studies have sought to determine the prevalence of this issue and its potential impact on patient outcomes [2-4].

In light of this specific and clinically important issue, Kang et al. [2] investigated the incidence of and risk factors for the development of significant TR after isolated AVR through a retrospective analysis. Notably, they excluded preoperative TR of moderate or greater severity, focusing instead on the progression of non-significant TR at baseline, for which surgical repair is generally not recommended in current practice guidelines. During a median follow-up of 86.7 months, significant progression to TR was rare, but preoperative mild TR and dialysis for end-stage renal disease emerged as significant risk factors for TR development [2]. For instance, the cumulative incidence of significant TR at 10, 20, and 25 years was 0.77%, 3.83%, and 6.42%, respectively, among those who had baseline no, trivial, or mild TR. While Kang et al. [2] advocate for prophylactic tricuspid valve repair in patients with risk factors, such as end-stage renal disease, it is worth noting the life expectancy of those patients. Considering the annual mortality rates of dialysis patients in the United States Renal Data System Annual Report, which were 87.4 per 1,000 patient-years for the age group of 18–44 and 146.4 per 1,000 patient-years for the age group of 45–64 [5], the potential benefit of proactive TR surgery for mild disease seems

questionable given these patients' limited life expectancy. The extended period of cardiopulmonary bypass needed for concomitant tricuspid repair may affect dialysis adversely in these vulnerable patients, which warrants careful consideration.

Although Axtell et al. [6] found no significant difference in long-term survival between surgically treated and medically managed groups for isolated severe TR when accounting for immortal time bias (hazard ratio, 1.34; 95% confidence interval, 0.78–2.30;  $p=0.288$ ), the efficacy of prophylactic tricuspid valve repair remains questionable and merits further discussion. Recent 1-year follow-up data suggest that transcatheter tricuspid repair is safe and effective in patients with moderate or greater TR who are at high surgical risk [7]. In this regard, the transcatheter option may serve as a valuable alternative for high-risk patients who develop significant TR after AVR, who may require more than medical therapy alone.

The development of significant TR after isolated AVR presents complex management challenges. Although the study of Kang et al. [2] sheds light on several risk factors and progression patterns, the optimal timing for intervention and the role of prophylactic tricuspid valve repair remain contentious. The lack of sophisticated echocardiographic data, such as tricuspid annular diameter and right ventricular dimension and volume, also remains a limitation of their study [2]. Therefore, a comprehensive and multidisciplinary approach is necessary to navigate this intricate territory and offer patients the best possible outcomes.

## Article information

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### Conflict of interest

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