

Editorial

Is indexed right ventricular end-diastolic volume a new key for the tricuspid regurgitation puzzle?



Volumen telediastólico ventricular derecho indexado: ¿una nueva pieza para el puzzle de la insuficiencia tricuspídea?

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In the dawn of the growing interest in revisiting the so-called “forgotten valve”, there are many questions on tricuspid regurgitation (TR) assessment and management. A recent article published in *Revista Española de Cardiología* by Rodríguez-Palomares et al.¹ describes 43 prospectively enrolled patients who underwent tricuspid valve surgery due to severe secondary TR; 19 patients (44.2%) had previous cardiac surgery. Although severe TR was the main indication for surgery, with all of the patients receiving a tricuspid ring annuloplasty, 31 patients (72%) required a concomitant left-sided valvular intervention, with mitral valve repair being the most common (60.5%). In the echocardiographic assessment, patients showed signs of right ventricle (RV) dysfunction, such as dilated tricuspid annulus and diminished annular systolic excursion, and 37 patients (86.1%) had massive TR according to the classification proposed by Hahn et al.,² which correlates with RV dilation, annular dilation, and adverse clinical outcomes at 1 year.^{3,4} In line with current literature, 9.3% patients died in the perioperative period. The 3-year mortality was 16.3%, and almost 30% showed a combined endpoint of death or hospitalization for heart failure.

Outcomes after tricuspid valve surgery are poor, and important modifiable factors such as late referral and an underuse of concomitant tricuspid repair at the time of left-sided surgery could help to improve them. Concomitant tricuspid intervention has been thoroughly studied in the last few decades. It does not pose an additional perioperative risk and is associated with favorable outcomes, such as reverse right ventricular remodeling and an improvement in functional status.⁵ Therefore, an early TR guideline-directed intervention favoring repair whenever possible should always be considered to reduce the risk of late TR occurrence or progression. Regarding isolated TR interventions, since contemporary surgery carries a high risk for perioperative mortality and has not demonstrated a clear benefit on survival in long-term follow-up, a more aggressive approach would be reasonable, with surgery being performed at the first signs of

ventricular enlargement and dysfunction, as recommended in current guidelines (class IIa recommendation).^{6–8}

As mentioned by the authors, the main study finding was that end-diastolic right ventricular volume index assessed by cardiac magnetic resonance (CMR) constituted the best predictor of cardiovascular outcomes including TR recurrence during follow-up.¹ Based on this result, the authors suggest that post-TR intervention survival could be improved if patients are referred for surgery before showing an end-diastolic RV volume of 104 mL. Currently, CMR allows for functional assessment of complex right ventricle (RV) shape and is the gold standard for quantitative assessment. Regarding preoperative TR evaluation, a lower end-diastolic right ventricular index was previously associated with favorable RV function recovery after TR surgery,⁹ and Park et al.¹⁰ showed that an RV ejection fraction below 46% was a predictor for cardiovascular death. Importantly, cutoff values for TR severity are currently borrowed from mitral regurgitation; nonetheless, Zhan et al.¹¹ recently reported that a TR volume ≥ 45 mL or a TR fraction $\geq 50\%$ were associated with lower survival at 2.6 years. This evidence, along with that provided in the present article, will strengthen CMR capabilities for risk stratification.

Although multimodality imaging is of major importance in the assessment of these patients, some caveats must be mentioned. CMR is more expensive than echocardiography and is not widely available. Furthermore, like the present study, most studies on CMR evaluation come from large academic centers and do not reflect the current practice for valve disease assessment in the general population. From an individual standpoint, CMR is not feasible in patients with incompatible pacemakers or defibrillators and in patients with atrial fibrillation or premature ventricular contractions imaging quality—and consequently quantitative assessment—might be compromised (specific techniques to overcome this problem have been proposed).¹² Therefore, currently, the appropriateness criterion for using this imaging technique consists of cases with inconclusive echocardiographic examination.^{13–15}

The journey through the tricuspid valve is an exciting field for research that will benefit from an integrative approach to improve assessment and management. We must always remember the importance of a thorough follow-up, so we can optimize the timing of intervention and be able to offer a more individualized, and hopefully, better treatment to our patients.

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CONFLICTS OF INTEREST

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