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Commentary: Mind MELD complete: Can the model for end-stage liver disease (MELD) score predict risk in isolated tricuspid surgery?

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Isolated tricuspid valve disease continues to be a challenging and poorly understood set of overlapping clinical problems. Fundamentally, the question remains whether tricuspid regurgitation (TR) in an individual patient represents a primary reversible disease process that merits a direct therapeutic intervention or alternatively represents late sequela of other comorbidities in which interventions aim to palliate symptoms rather than reverse underlying primary pathology. Current guidelines recommend intervention only in instances of severe regurgitation with concomitant right-sided heart failure.¹ At best, intervention has been reliably shown only to reduce symptoms and decrease need for repeat hospitalization, without a clear survival advantage.² At worst, there is significant morbidity and mortality, with 30-day mortality of 6% to 10% in most recent series.²⁻⁴ Given the historically poor outcomes associated with tricuspid interventions, patients are often considered for operation late in the course of this disease only after signs of clinically significant overt right heart failure are evident.⁵

Predicting operative risk in tricuspid surgery has been historically challenging. The current Society of Thoracic Surgeons (STS) risk model has no option specific for isolated tricuspid surgery, and the European System for

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CENTRAL MESSAGE

Isolated tricuspid valve surgery has traditionally carried a high risk of morbidity and mortality. MELD score may be a useful mechanism of identifying patients at high risk of a poor outcome.

Cardiac Operative Risk Evaluation II model provides only generalized risk without regard to any specific procedure.⁶ To this end, improving risk calculation for isolated tricuspid surgery may offer an avenue for improved outcomes by helping select those patients most suitable for intervention (lower periprocedural risk) and avoiding intervention in those unlikely to benefit.

In this issue of the *Journal*, Faerber and colleagues⁷ report on the utility of the model for end-stage liver disease (MELD) score as a predictive tool to aid in the risk-stratification of patients being considered for isolated tricuspid valve surgery. As unchecked TR often leads to both clinical and subclinical liver dysfunction, the authors reasoned that liver dysfunction may be a significant cause of poor outcomes associated with tricuspid intervention. From 2011 to 2019, 157 patients underwent isolated tricuspid surgery for moderate-to-severe TR. Nearly all patients underwent surgery on cardiopulmonary bypass, and most all repairs were done on a beating-heart through a nonsternotomy approach. Patients were categorized into low (<10), intermediate (10-19), and high (≥ 20) terciles based on MELD score. STS scores were calculated using surrogate algorithms for isolated aortic valve replacement. Overwhelmingly, patients with high MELD scores (≥ 20) demonstrated extremely poor outcomes, with a 30-day mortality of 31% and median survival of only 0.6 years

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and a rate of new-onset dialysis of 31%. The intermediate group fared slightly better, with a median survival of 3.7 years and a rate of new heart disease of 17%. Interestingly, the largest benefit in quality of life (in survivors) was seen in those with a high MELD score, perhaps suggesting that their preoperative quality of life was extremely poor.

The idea that liver dysfunction may explain the poor outcomes associated with isolated TR is not new. Previous studies have demonstrated that greater MELD scores are associated with poor outcomes after tricuspid valve surgery; however, none has attempted to correlate them with STS or European System for Cardiac Operative Risk Evaluation II scores.^{8,9} Although this study is unable to make any definitive statements regarding the possible benefit of intervention in the context of MELD score, perhaps it is most useful in helping to inform who should not be treated surgically. Future studies should assess possible role for earlier surgical intervention before overt right ventricular dysfunction, perhaps using more accurate echocardiographic assessment of strain for primary severe TR in patients with low MELD scores. At the other end of the spectrum and chronicity, in patients with high MELD score, assessment of the role newer emerging catheter-based interventions (avoiding non pulsatility and cardiopulmonary bypass)

should be compared with goal-directed conservative medical management.

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