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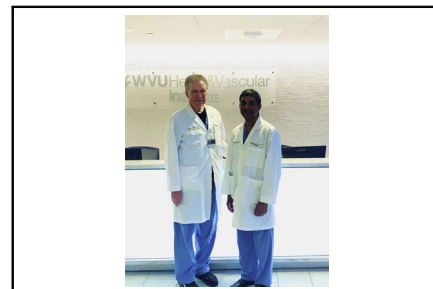
Commentary: Structural solutions for isolated, severe, symptomatic tricuspid regurgitation are eagerly awaited

Ramesh Daggubati, MD,^a and
Harold G. Roberts, Jr, MD^b

Tricuspid regurgitation (TR) is among the most commonly detected valvular abnormalities. Some degree of TR on echocardiogram was found in 84% of the population in the Framingham study, whereas at least moderate TR was noted in 8% of the overall population.^{1,2} The majority of pathologic TR is functional TR with the common causes being pulmonary hypertension, right ventricular (RV) dysfunction, and volume overload due to an intracardiac shunt.³ An increasingly common cause of TR is displacement or injury of the tricuspid valve leaflets by pacemaker or defibrillator leads. Although usually initially asymptomatic, moderate and severe TR are associated with a 5-year mortality of 55% and 65%, respectively, comparable to many malignancies.⁴

Although surgery for isolated tricuspid valve regurgitation comprises <15% of patients undergoing cardiac surgery, it may carry a mortality rate of at least 9% and morbidity up to 71%, especially when performed as an isolated redo operation following mitral valve surgery.⁵ Understandably, <0.5% of the 1.6 million moderate to severe TR patients are treated surgically because most patients are referred late after RV dysfunction or once severe pulmonary hypertension has become evident, often accompanied by hepatic and renal failure.

The tricuspid valve annulus is a complex, elliptical, and nonplanar structure that becomes planar and more circular as the RV dilates. Functional TR is a result of relatively small, otherwise normal leaflets poorly coapting in an often subannular position. In the presence of severe TR, RV, and



Harold G. Roberts, Jr, MD (left), and Ramesh Daggubati, MD (right)

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Effective, durable, structural solutions for tricuspid regurgitation could potentially save patients from an inherently high-risk cardiac surgical procedure.

right atria dilate in response to increasing preload to maintain compliance.⁶ Unfortunately, guidelines do not recommend annual echocardiograms for less than severe TR, often resulting in these patients presenting in the later stages of RV dysfunction.

Donatelle and Ailawadi⁷ provide a concise overview of the transcatheter options for the treatment of TR. Although many of these devices are investigational and following the pathways of percutaneous mitral valve therapies, the main difference will be the high incidence of pacemaker or defibrillator leads that might limit the options in the tricuspid space. Although annuloplasty bands and leaflet repairs have been performed with promising 1-year results, long-term data are awaited before we can draw conclusions as to their value.⁸

The possible benefit of percutaneous therapies for TR is their inherently less invasive approach with potentially lower morbidity and mortality. Their largely investigational status confines their current use in patients with prohibitive risks for surgery. Unfortunately, the delayed recognition of symptoms may limit the success of these devices when used only in patients with severe TR and coexisting extracardiac organ dysfunction. Earlier recognition of RV compliance and dysfunction as well as eventual comparison of repair by surgery versus percutaneous methods is crucial.⁹ Finally, even surgeons actively participating in structural procedures may have somewhat wistfully observed the inexorable replacement of surgical procedures by the catheter, we dare say that few of us would begrudge an effective structural

From the ^aDivision of Cardiology and ^bDepartment of Cardiovascular and Thoracic Surgery, West Virginia University, Morgantown, WV.

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Address for reprints: Harold G. Roberts, Jr, MD, Department of Cardiovascular and Thoracic Surgery, West Virginia University, 1 Medical Center Dr, Morgantown, WV 26506 (E-mail: Harold.roberts@wvumedicine.org).

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solution for our patients experiencing the ravages of isolated, severe TR.

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Commentary: The forgotten valve no longer: But what about the intervention?

Vivek Rao, MD, PhD

The tricuspid valve is often referred to as the “forgotten” valve, as historically, surgeons have been loath to intervene for a variety of reasons. Beginning with the indications for surgery, the available options, and the long-term results, surgical management of primary or secondary tricuspid valve pathology has been fraught with challenges.^{1,2}

The most common pathology for isolated tricuspid disease is infective endocarditis, usually due to intravenous drug abuse. The high rate of recidivism in this population, which portends the risk of converting native valve to prosthetic valve endocarditis, has led to a more conservative approach to this population. Furthermore, the need for

From Cardiovascular Surgery, Room Number 4PMB-457, Peter Munk Cardiac Centre, Toronto General Hospital, Toronto, Ontario, Canada.

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Address for reprints: Vivek Rao, MD, PhD, Cardiovascular Surgery, Peter Munk Cardiac Centre, Toronto General Hospital, 200 Elizabeth St, Toronto, Ontario, Canada M5G2C4 (E-mail: vivek.rao@uhn.ca).

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Vivek Rao, MD, PhD

CENTRAL MESSAGE

Percutaneous tricuspid valve therapies will result in greater referrals of patients for heart team assessment. Surgeons should maintain an active role in decision making for this patient population.

formal valve replacement has reduced the enthusiasm for surgical intervention. There is a general, unfounded acceptance that tricuspid valve replacement is associated with poor outcomes. An earlier report from our institution demonstrated an overall survival of 37% and a conditional survival of 50% at 15 years in patients receiving either mechanical or biologic valves.¹ Conditional survival was measured in patients who were discharged from hospital following their index operation. However, few studies