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Commentary: Tricuspidization of a quadricuspid aortic valve: Different valve, same repair

Harold M. Burkhart, MD,^a Jess L. Thompson, MD,^a and Arshid Mir, MD^b

Quadricuspid aortic valve is a rare anomaly with a frequency of 0.006%. If patients present clinically, it is typically in the fourth or fifth decade of life with aortic valve insufficiency.¹ Approximately 20% will require surgical correction, accounting for 0.5% to 1.0% of aortic valve operations for insufficiency.^{1,2} Of note, quadricuspid truncal valves are commonly seen in congenital cardiac disease, being present in at least 20% of patients with truncus arteriosus.³ The predominant mode of presentation in these patients is insufficiency. Most of these patients have uniform or nodular thickening with dysplastic cusps and unequal cusp size. The etiology of the insufficiency is a combination of restricted leaflet motion from dysplastic cusps, excessive motion due to leaflet prolapse, and cusp tears.⁴

In this issue of the *Journal*, Perrier and colleagues⁵ describe a case of a quadricuspid aortic valve that was repaired. The 39-year-old patient was symptomatic because of severe insufficiency of the valve from a central coaptation defect. The aortic valve had 4 cusps of equivalent size. Upon inspection, the right-sided, more posterior accessory non-coronary cusp was prolapsing. The repair technique they used was tricuspidization via sinus resection and annular plication. The root was then reimplemented using a 26-mm prosthesis. Four months after the operation, the patient was asymptomatic, his ejection fraction had improved from 50% to 60%, and there was only trivial aortic insufficiency. The authors should be congratulated on an excellent



Magnetic resonance image showing quadricuspid truncal valve (*).

CENTRAL MESSAGE

Tricuspidization of a quadricuspid semilunar valve is a known congenital cardiac technique that may be successfully used in the adult patient.

result with a complex operation. One of the strengths of the article is the inclusion of images and a video that beautifully illustrate the repair technique. In addition, using the leaflet to buttress the suture line is a novel modification.

Imamura and colleagues⁶ were the initial advocates of the annulovalvuloplasty technique of transforming a quadricuspid semilunar valve to a tricuspid valve. They reported successful tricuspidization of insufficient quadricuspid truncal valves in 3 neonates at the time of complete truncus arteriosus repair. Soon after, Mavroudis and Backer⁷ reported their experience with truncal valve remodeling. They reported truncal valve interventions in 8 patients, 3 of whom had leaflet excision and tricuspidization of an insufficient quadricuspid valve. In 2 of these patients, the leaflet excised involved a coronary sinus necessitating coronary artery reimplantation. The outcomes with this technique were excellent, leading them to support the use of this technique when possible.

The annulovalvuloplasty technique of reducing a quadricuspid semilunar valve to a tricuspid valve effectively treats valvular insufficiency. The procedure allows for downsizing and remodeling the annulus while minimizing leaflet sutures. This proven truncal valve technique appears to be an effective strategy in adult patients presenting with aortic valve insufficiency.

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From the ^aDivision of Cardiovascular and Thoracic Surgery, University of Oklahoma Health Sciences Center, Oklahoma City, Okla; and ^bSection of Pediatric Cardiology, University of Oklahoma Health Sciences Center, Oklahoma City, Okla.

Disclosures: Authors have nothing to disclose with regard to commercial support. Received for publication Dec 6, 2019; accepted for publication Dec 12, 2019; available ahead of print Jan 28, 2020.

Address for reprints: Harold M. Burkhart, MD, Division of Cardiovascular and Thoracic Surgery, University of Oklahoma Health Sciences Center, PO Box 26901, WP-2230, Oklahoma City, OK 73105 (E-mail: Harold-burkhart@ouhsc.edu).

JTCVS Techniques 2020;1:32-3
2666-2507

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<https://doi.org/10.1016/j.jtc.2020.01.002>

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