Cow neck veins and endocarditis: A moo...ving mystery

Ronald K. Woods, MD, PhD

From the Division of Pediatric Cardiothoracic Surgery, Department of Surgery, Medical College of Wisconsin, and Herma Heart Institute, Children's Hospital of Wisconsin, Milwaukee, Wis.

Disclosures: Author has nothing to disclose with regard to commercial support.

Received for publication March 21, 2018; accepted for publication March 23, 2018; available ahead of print April 16, 2018.

Address for reprints: Ronald K. Woods, MD, PhD, Children's Hospital of Wisconsin, 9000 W Wisconsin Ave, MS B 730, Milwaukee, WI 53226 (E-mail: rwoods@chw.org).

J Thorac Cardiovasc Surg 2018;156:735-6

0022-5223/\$36.00

Copyright © 2018 by The American Association for Thoracic Surgery

<https://doi.org/10.1016/j.jtcvs.2018.03.093>

Surgeons loathe endocarditis—it kills patients and causes morbidity. Moreover, nothing puts a damper on a surgeon's day like a multiple redo sternotomy and inadvertent rupture of an endocarditic conduit. Therefore, the report by Beckerman and colleagues¹ of increased risk of infective endocarditis (IE) with bovine jugular vein (BJV) conduits (Medtronic Inc, Minneapolis, Minn), which is a notable addition to the growing literature on this topic, is certainly concerning. At a median follow-up of 7.5 years, IE occurred in 10% of 253 BJV conduits, 0.8% of 506 homografts, and 1.9% of 269 porcine heterografts.¹ Such figures are approximately similar to what has been reported by others.²⁻⁵ The largest series of 444 BJV conduits, reported by Sandica and colleagues,³ documented IE in 5.5% of patients, with a hazard ratio of 22.9 compared with homografts.³ None of the reports provide specific data on supported versus unsupported BJV conduits. One somewhat unique aspect of the report by Beckerman and colleagues¹ is that the incidence curves were similar out to approximately 7 years, at which point notable divergence occurred. Clinical presentation varied, often without dramatic effect, resulting in a median duration of symptoms of 21 days before diagnosis. The implications are clear: We and our referring sources need to know that a high index of suspicion should be maintained for a prolonged period of follow-up.

Perhaps not surprisingly, there are reports of increased risk of IE for the Melody valve (Medtronic Inc) as well, with IE occurring in 5% to 8.6% of implants with only 2.5 years of follow-up in the largest series.⁵⁻⁷

The answers to the obvious question of why both bovine jugular products would pose this risk remain purely speculative. In addition to the various potential factors reviewed by the authors,¹ it is difficult to completely discount factors specific to the process of procurement of the conduit from an animal. In this regard, Beckerman and colleagues¹ first noting of IE in 2010 is mildly intriguing when viewed retrospectively with the knowledge that a couple of years later programs (at least in the United States) were informed of a possible reduction in product availability due to

Ronald K. Woods, MD, PhD

Central Message

Compared with homografts and porcine heterografts, bovine jugular vein conduits appear to be associated with an increased risk of endocarditis.

See Article page 728.

demand/supply issues. However, to date, there has been nothing remarkably consistent in the bacteriology of the reported cases that would implicate anything specific to the animal harvest per se.

The issue of IE aside, the BJV conduit has desirable features in terms of durability, pliability, amount of tissue, and (very importantly) availability. Even if the IE risk is real, there remain circumstances in which use of the BJV conduit would be justified. Optimal patient care remains the goal. Programs should engage in multidisciplinary discussions, informed also by their program-specific data, in weighing risk versus benefit and determining the most appropriate conduit or valve option for each patient. Moreover, when an IE event occurs, we need to provide detailed information to the appropriate regulatory agencies and the manufacturers to facilitate a more enlightened understanding of this moo...ving mystery.

References

1. Beckerman Z, De Leon LE, Zea-Vera R, Mery CM, Fraser CD. High incidence of late infective endocarditis in bovine jugular vein valve conduits. *J Thorac Cardiovasc Surg*. 2018;156:728-34.
2. Albanesi F, Sekarski N, Lambrou D, Von Segesser LK, Berdajs DA. Incidence and risk factors for Congrega graft infection following right ventricular outflow tract reconstruction: long-term results. *Eur J Cardiothorac Surg*. 2014;45:1070-4.
3. Sandica E, Boethig D, Blanz U, Goerg U, Andreas Hass N, Thorsten Laser K, et al. Bovine jugular veins versus homografts in the pulmonary position: an analysis across two centers and 711 patients—conventional comparisons and time status grafts as a new approach. *Thorac Cardiovasc Surg*. 2016;64:25-35.
4. Urso S, Rega F, Meuris B, Gewillig M, Eyskens B, Daenen W, et al. The Congrega conduit in the right ventricular outflow tract is an independent risk factor for graft replacement. *Eur J Cardiothorac Surg*. 2011;40:603-9.

5. Van Dijk I, Budts W, Cools B, Eyskens B, Boshoff DE, Heying R, et al. Infective endocarditis of a transcatheter pulmonary valve in comparison with surgical implants. *Heart*. 2015;101:788-93.
6. McElhinney DB, Benson LN, Eicken A, Kreutzer J, Padera RF, Zahn EM. Infective endocarditis after transcatheter pulmonary valve replacement using the mel-ody valve: combined results of 3 prospective North American and European studies. *Circ Cardiovasc Interv*. 2013;6:292-300.
7. Patel M, Malekzadeh-Milani S, Ladouceur M, Iserin L, Boudjemline Y. Percutaneous pulmonary valve endocarditis: incidence, prevention, and management. *Arch Cardiovasc Dis*. 2014;107:615-24.