See Article page 308.

Commentary: Novel comprehensive stage II: A metal heavy concept

Ronald K. Woods, MD, PhD

Decampli and colleagues¹ first introduced the novel comprehensive stage II in 2015 with a report of 2 patients. Now they present to us a report utilizing computational flow dynamics (CFD) to characterize flow pathways and inform of potential vulnerabilities and mitigating techniques.² I have a lot of respect for this group of investigators and their expertise in this field of study. I thank them for their courage to be creative and to try to make improvements and for their present expert use of CFD to gain further insight. Although I am not in a position to judge the CFD work, it appears to be a very sophisticated and elegant analysis of the novel comprehensive stage II flow characteristics. I encourage readers to realize just how complex such an analysis can be and the expert manner in which the authors approached the problem. However, I also encourage a somewhat different byte-free perspective.

The senior author published an experience with the first 2 patients in 2015. In an accompanying submission updating their clinical experience, they report on a total of 4 patients.³ Presumably, the additional 2 were from the interval since 2015. Two patients in 5 or 6 years would seem to challenge the learning curve mentioned by the authors. Is this patient selection? What should we objectively measure to determine whether there is adequate antegrade flow via the native aorta to support the brain after this reconstruction? The implication that avoidance of major surgery provides net

Ronald K. Woods, MD, PhD

CENTRAL MESSAGE

Computational modeling, when employed by the hands of experts, may inform logical design of a novel comprehensive stage II.

lower morbidity over the long-term certainly warrants more investigation because this technique seems to be plagued by the need for several reinterventions, mostly catheter based. At least in my opinion, the biggest drawback is the intentional introduction of so much metal during the first year of life. I admit that stents can be lifesaving, but I am not a fan of designing a reconstruction that mandates this much metal in an area of high-end real estate. Performance through the adolescent and early teenage growth years would seem to be a big vulnerability, despite the option of further stent dilation as the child grows. I trust the authors are not advocating all surgeons add this to technique to their repertoire. I likewise trust the authors will continue in their careful and thoughtful investigative manner and continue to educate us about further refinements and the long-term performance issues.

References

1. DeCampli WM, Fleishman CE, Nykanen DG. Hybrid approach to the comprehensive stage II operation in a subset of single-ventricle variants. *J Thorac Cardiovasc Surg.* 2015;149:1095-100.
2. Hameed M, Prather R, Divo E, Kassab A, Nykanen D, Farias M, et al. Computational fluid dynamics investigation of the novel hybrid comprehensive stage II operation. *J Thorac Cardiovasc Surg Open.* 2021;7:308-23.
3. Farias M, Fleishman CE, Nykanen D, DeCampli WM. Clinical update on the hybrid comprehensive stage II operation. *J Thorac Cardiovasc Surg Open.* 2021;7:327-35.

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

Disclosures: The author reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication June 4, 2021; revisions received June 4, 2021; accepted for publication June 6, 2021; available ahead of print June 25, 2021.

Address for reprints: Ronald K. Woods, MD, PhD, Department of Surgery, Medical College of Wisconsin, 9000 W Wisconsin Ave, MS B 730, Milwaukee, WI 53226 (E-mail: rwoods@chw.org).

JTCVS Open 2021;7:324

2666-2736

Copyright © 2021 The Author(s). Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.xjon.2021.06.010>