See Article page 262.

Commentary: A synergy of two is better than one: Modern-day heart team approach to robotic congenital heart surgery

Joseph W. Turek, MD, PhD,^a and Niv Ad, MD^{b,c}

In 1998, Alain Carpentier performed the first robotic mitral valve repair using the Da Vinci system. The field of robotic heart surgery has evolved since with other applications such as coronary bypass grafting and procedure for other valves. While robotic and robotic-assisted repairs have previously been applied in the congenital realm to partial anomalous pulmonary venous connections, these reports are admittedly rare. This issue of *JTCVS Techniques* adds a novel entry to the congenital heart surgery robotic experience with a robotic-assisted 2-patch repair of right partial anomalous pulmonary venous connection and sinus venosus atrial septal defect (ASD).¹

This report describes a superior sinus venosus ASD with partial anomalous pulmonary venous connection, consisting of right upper and middle lobe veins connected 1.5 cm up the superior vena cava. A robotic-assisted approach was undertaken, using a 4-cm right thoracotomy and 3 robotic ports. A 2-patch repair was chosen to address high insertion of the veins and to avoid superior vena cava obstruction. The authors achieved an excellent result. However, there was a protracted crossclamp time, likely reflecting patient size and a significant learning curve.

From ^aDuke Children's Pediatric & Congenital Heart Center, Durham, NC; ^bDivision of Cardiac Surgery, University of Maryland School of Medicine, Baltimore, Md; and ^cAdventist White Oak Medical Center, Silver Spring, Md.

Disclosures: Dr Ad reports a relationship with Medtronic, AtriCure, LivaNova, and Left Atrial Appendage Occlusion, LLC. Dr Turek 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 Sept 9, 2020; revisions received Sept 9, 2020; accepted for publication Sept 24, 2020; available ahead of print Sept 28, 2020.

Address for reprints: Niv Ad, MD, Division of Cardiac Surgery, University of Maryland School of Medicine, 110 S. Paca St, 7th Floor, Baltimore, MD 21201 (E-mail: nivadmd14@gmail.com).

JTCVS Techniques 2020;4:267-8
2666-2507

Copyright © 2020 The Authors. 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.jtc.2020.09.029>

Robotic 2-patch repair of sinus venosus defect with partial anomalous pulmonary veins.¹

CENTRAL MESSAGE

Innovation is advanced and patients benefit when programs leverage congenital heart expertise with minimally invasive skill in adult cardiac surgery.

This particular procedure also raises the question as to whether an additional surgical atrial fibrillation (AF) treatment should have been applied. The evidence surrounding the beneficial effect of surgical treatment for AF is constantly evolving. While there are clear societal recommendations regarding indications for surgical ablation in patients with well-established AF, debate still exists as to the best approach to treat those at greater risk for developing lifelong AF following a procedure. Current evidence suggests that adult patients undergoing surgical closure of an ASD should have a concomitant Cox maze procedure even without a history of AF, due to the high percentage of AF during post-procedure follow-up.²

Probably most telling about this unique case was the manuscript authorship. It is evident the group from West Virginia University leverages their advanced cardiac surgery robotic skills in collaboration with institutional congenital cardiac surgery expertise to benefit this patient. This collaborative approach has been the genesis of many congenital heart surgery advancements in minimally invasive techniques.³ By and large, congenital heart surgeons lack the consistent repetitions needed to be as proficient at robotic surgery (or other minimally invasive techniques) as adult cardiac surgery counterparts. Conversely, adult cardiac surgeons are not exposed to sufficient congenital cases to fully appreciate various subtleties of these procedures and stay current on the state of the art for these repairs. In the microcosm of this commentary, we pursued a similar course of collaboration, in having the congenital surgeon contribute to congenital topics and the minimally invasive and AF expert weigh in on these discussions. We would

challenge more heart teams to learn from forward-thinking programs like the one in this case report to develop these strategic collaborations. Clearly, important synergies can be realized by collaborations between adult and congenital heart surgeons on these cases. To accelerate innovation and adoption of minimally invasive congenital heart surgery, we believe a synergy of two is truly better than one.

References

1. Sef D, Wei LM, Rankin JS, Spear CR, Gustafson RA, Badhwar V. Robotic-assisted two-patch repair of right partial anomalous pulmonary venous connection and sinus venosus defect. *J Thorac Cardiovasc Surg Tech*. 2020;4:262-4.
2. Mavroudis C, Stulak JM, Ad N, Siegel A, Giamberti A, Harris L, et al. Prophylactic atrial arrhythmia surgical procedures with congenital heart operations: review and recommendations. *Ann Thorac Surg*. 2015;99:352-9.
3. Alsarraj MK, Nellis JR, Vekstein AM, Andersen ND, Turek JW. Borrowing from adult cardiac surgeons—bringing congenital heart surgery up to speed in the minimally invasive era. *Innovations*. 2020;15:101-5.