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Commentary: Robotic repair of a sinus venosus atrial septal defect in an adult patient: A technical stunt or a preview of things to come?

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CENTRAL MESSAGE

Can the successful application of a robotic repair technique show the way for the adoption of robotic technology in the repair of adult congenital heart disease pathologies?

In this issue of the *Journal*, Sef and colleagues¹ present a case of sinus venosus atrial septal defect and right-sided partial anomalous pulmonary venous return repaired with the 2-patch technique using a robotic approach in a 30-year-old male patient with a good result. Robotic cardiac surgery is an established platform used most commonly in mitral valve surgery and hybrid coronary artery revascularization operations. In the case of mitral valve repair, surgery using the robot can offer distinct advantages in terms of visualization, exposure, and cost in a high-volume program.² More widespread adoption is likely limited by hospital resources (when an institution invests in the purchase of the robot, there is often competition with other surgical disciplines that have found reliable and reproducible use of this complex technology), individual surgeons' motivation to navigate the learning curve, and complexity integrating robotic surgery with resident training. The clinical results of robotic cardiac surgery have not yet been shown to be "game changing" compared with sternotomy and may have some drawbacks compared with other minimally invasive techniques.³

There are a few case reports similar to this one but notably just one from a congenital surgeon in North America 15 years ago.⁴ This probably speaks to the 2 major

limiting factors for the proliferation of robotic surgery in congenital disease: congenital heart surgery pathology and congenital surgeons! Most congenital patients and diseases are not amenable to current robotic technology and therefore the majority of congenital surgeons are not familiar or facile with the robotic platform.

The team in West Virginia ought to be congratulated about trying to push the envelope and combining the expertise of the robotic adult cardiac surgeons with that of the congenital heart surgery team. Maybe they are showing us a safe and optimal way for robotic surgery to be more widely adopted in adult congenital heart surgery. Their approach ought to be commended even though there is current debate about whether the 2-patch technique should even continue to be used for repair of sinus venosus atrial septal defect and partial anomalous pulmonary venous return, given the high incidence of non-sinus rhythm observed by some in long-term follow-up.⁵

Nonsternotomy cardiac surgery works, but only if the surgeon and their operative team are dedicated to it and develop a practice in which sternotomy almost becomes the "alternate" approach, like the team in West Virginia is pursuing. Experienced robotic surgeons will continue to apply their skills in different situations, as Sef and colleagues have done, with good outcomes, but whether this translates into a new standard of care that will push

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congenital surgeons to learn and master robotic technologies in the future remains to be seen.

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