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Commentary: Building a successful robotic mitral surgery program—one size does not fit all

Irbaz Hameed, MD, and Arnar Geirsson, MD

In this issue of the *Journal*, Chemtob and colleagues¹ report their conservative approach to determine candidacy for robotic mitral valve surgery at the Cleveland Clinic. Their study covers a large volume of patients spanning 5 years with excellent outcomes and deserves commendation. While a conservative screening strategy for robotic mitral surgery can confer good outcomes (particularly in emerging and less experienced robotic centers), such an approach may not be generalizable and should not curtail application of the technology or its innovation.

In their single-center observational study, the Cleveland group recommends echocardiographic and computed tomography imaging criteria for screening robotic mitral surgery patients that preclude patients with aortoiliac atherosclerosis, small femoral arteries, greater than mild aortic regurgitation, moderate or more mitral annular calcification, and left ventricular dysfunction.¹ By applying this algorithm, outcomes comparable with a sternotomy-based approach were achieved, but 40% of the screened patients with

Dr Arnar Geirsson during a robotic mitral valve repair with the robotic team at Yale.

CENTRAL MESSAGE

The establishment of a successful robotic mitral surgery program is a complex, multitiered process involving institutional, surgeon-, and patient-related variables.

isolated degenerative mitral valve disease were excluded. This strict approach may be feasible in extremely high-volume centers such as the Cleveland Clinic but not in an average high-volume cardiac surgery center in the United States with limited mitral surgery volume and modest robotic infrastructure. In such centers, excellent outcomes can in fact be achieved using more aggressive selection criteria as previously documented.² It is further possible that due to nonrandomization of patients in the study by Chemtob and colleagues,¹ confounders unrelated to the screening algorithm such as surgeon experience and treatment allocation bias were present, which further limit the generalizability of their proposed screening criteria to other centers.

Despite the impressive benefits of robotic mitral surgery, unfortunately only few centers worldwide have been able to establish successful and enduring robotic mitral surgery programs. The maintenance of a robust program requires

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Disclosures: Dr Geirsson is a member of Medtronic's Strategic Surgical Advisory Board. Dr Hameed 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 Dec 12, 2020; revisions received Dec 12, 2020; accepted for publication Dec 14, 2020; available ahead of print Dec 25, 2020.

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J Thorac Cardiovasc Surg 2022;164:1089-90
0022-5223/\$0.00

Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery

<https://doi.org/10.1016/j.jtcvs.2020.12.065>

team expertise built and maintained through a high and steady stream of robotic mitral surgery cases after overcoming a challenging initial learning curve. Centers must be committed to meet the cost, technical demands, and specialized resources for robotic mitral surgery including dedicated operating rooms, nursing, anesthesia, and perfusion teams. The lead robotic mitral surgeons must assemble such a dedicated team and engage in multidisciplinary collaborations with interventional cardiologists, echocardiographers, and intensive care staff experienced in robotic surgery.³ In terms of patient selection, a flexible algorithm that maximizes application of robotic mitral surgery without sacrificing patient outcomes is recommended. The choice of robot versus sternotomy must be patient-tailored following careful subjective and objective assessment of patient variables in the context of the team's capabilities.

To conclude, the robot is simply a surgical instrument. Like any other surgical equipment, the limits of its

applicability are operator dependent. Experienced surgeons running successful robotic mitral surgery programs regularly draw from their own experience to gauge patient variables when making complex judgement on surgical approach. The establishment and sustenance of a successful robotic mitral surgery program, ultimately, is a complex, multifaceted endeavor that requires fine synergy between institutional and surgeon-related variables as well as careful patient selection.

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Commentary: Reap what you sew: Excellent advice for a conservative algorithm for robotic mitral surgery

Heidi B. Nafday, MD, and Eugene A. Grossi, MD

The past 3 decades have seen great exploration of less-invasive approaches for mitral valve repair. Likewise, the use of robotic assistive technology for mitral repair has

Heidi B. Nafday, MD, and Eugene A. Grossi, MD

CENTRAL MESSAGE

New robotic mitral programs can benefit from a conservative patient selection algorithm as experience builds and surgeons gain confidence.

expanded during the past 2 decades. Nevertheless, robotic mitral surgery constitutes a small percentage of mitral surgery performed nationally.¹ Interest in less-invasive approaches will continue to expand, offering patients

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Disclosures: The authors 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 Dec 17, 2020; accepted for publication Dec 18, 2020; available ahead of print Dec 26, 2020.

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J Thorac Cardiovasc Surg 2022;164:1090-1
0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2020.12.081>