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Commentary: What was then is not now

Dawn S. Hui, MD,^a and Richard Lee, MD, MBA^b

In cardiac surgery, outcomes reporting for atrial fibrillation (AF) is challenging. For other cardiac operations, failure is defined by discrete, easily measurable criteria: graft patency for coronary artery bypass graft, recurrent regurgitation for valvular repair, and bioprosthetic degeneration for valve replacement. Repeat intervention also serves as a proxy for failure, although it may be subject to selection bias. For surgical ablation, however, detection of failure is more difficult by several magnitudes. Unless a patient has a permanent pacemaker (itself an undesirable outcome of AF ablation), rhythm monitoring is limited, and true AF burden cannot be captured. Definitions of failure have changed over time with technology, and what constitutes a clinically significant failure remains debatable.

In this edition of the *Journal*, Khiabani and colleagues¹ publish on their 15-year institutional experience with the Cox-maze IV (CM-IV). The impact of this paper on our collective knowledge of surgical ablation is substantial. It is one of the largest single-institution studies, with late follow-up from a center with experience and expertise. The findings confirm those of many smaller studies, namely that the CM-IV is highly effective in the short- and mid-term and that left atrial size and nonparoxysmal AF are risk factors for recurrence, among others. That more than 80% of the operations were done by a single surgeon with a consistent lesion set is a strength of the paper, as

Richard Lee, MD, MBA, and Dawn S. Hui, MD

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A large study from a center of expertise and experience contributes to our understanding of AF ablation, but discordance with previous findings raises questions about the choice of nonstandard end points.

it removes operator confounding. Interestingly, the findings of this paper differ somewhat from their 2015 study.² In the previous series, preoperative AF type did not predict late failure, whereas the current series shows nonparoxysmal AF to be a predictor of late recurrence. Further, the previous study also found duration of preoperative AF a significant predictor, with failure probability increasing as AF duration increased. In the current paper, AF duration was not a significant predictor.

These discordant findings were despite similar demographics, surgical techniques, selection criteria, and statistical analytic methods in the 2 papers (as would be expected for same-institution studies). Thus, we would be interested to hear the authors' statements on why these 2 excellent studies differed on these points. Possibly more problematic is the new end point that they propose. Freedom from atrial tachyarrhythmia recurrence was analyzed in 2 ways—freedom from recurrence at each time point, and freedom from recurrence over the entire study period. Although the former may be more clinically valid as the authors opine, it does not fit in the harmonized outcome measures schema endorsed by the Heart Rhythm Society.³ This creates a dilemma in comparing this study with other ablation and surgical literature.

There are a few other notable aspects. First, the strict definition of CM-IV was not applied to the entire cohort, with

From the ^aDepartment of Cardiothoracic Surgery, University of Texas Health Science Center at San Antonio, San Antonio, Tex; and ^bDivision of Cardiothoracic Surgery, Department of Surgery, Medical College of Georgia, Augusta University, Augusta, Ga. Disclosures: The authors reported no conflicts of interest.

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Address for reprints: Richard Lee, MD, MBA, Department of Surgery, Medical College of Georgia, 1120 15th St, BA-4300, Augusta, GA 30912 (E-mail: RICKLEE@augusta.edu).

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about 10% of patients having only left-sided lesions (an increase in proportion compared with their 2015 paper). However, this did allow study of the impact on permanent pacemaker needs, with biatrial lesions having a 3.61 odds ratio of pacemaker placement. Also of note is the 38% loss to follow-up at 10 years. Only 42 patients had complete follow-up in years 1-10, and only 31% to 39% had prolonged monitoring in post-ablation years 8-10. Thus, long-term data remain limited. Third, reintervention is often considered a factor in defining procedural failure. Unlike aortic or valve surgery, patients who undergo surgical ablation are rarely treated with repeat surgery for AF recurrence. In the current study, data on postsurgical catheter-based therapies for recurrence were not collected. Thus, to attribute ablation success solely to the surgical CM-IV may be an overreach. This would be especially important in counseling patients on the efficacy of the procedure.

Finally, whether this study will impact the nonsurgical world is in question, despite the excellent results. Head-to-head comparisons with catheter ablation remain scant, and comparisons across studies are methodologically unsound. Nevertheless, the authors are to be congratulated on their foresight and ongoing commitment to refining not only the surgical technique of the Cox-maze procedure but in refining their outcomes reporting and our understanding of surgical ablation for AF.

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Commentary: Do teach old dogs new tricks

Leonid Sternik, MD

First of all, I wish to thank Khiabani and colleagues¹ for their great efforts in the field of surgical treatment of atrial fibrillation (AF). This retrospective study is a kind of summary of their work. The authors describe 853 patients who underwent surgical treatment of AF at the same institution between 2003 and 2018. Interestingly, the classic technique of surgical AF ablation, the cut-and-sew maze (Cox-maze III), was developed by Cox and his colleagues more than 30 years at the same institution.² Cox-maze III was a very

Leonid Sternik, MD

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Cox-maze IV is an example of a new technology, based on old Cox-maze III and makes it easier to employ. Experienced “old” surgeons have to learn these new “tricks” and educate their young colleagues.

efficient procedure but not easy to perform and hasn't spread worldwide.¹ The Cox-maze IV, developed by Damiano and his team, is based on the lesion set of Cox-maze III, but many lesion lines are performed by radiofrequency and

From the Department of Cardiac Surgery, Sheba Medical Center, Affiliated to Tel-Aviv University, Tel-Hashomer, Israel.

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Address for reprints: Leonid Sternik, MD, Department of Cardiac Surgery, Sheba Medical Center, Ramat Gan, Israel (E-mail: leosternik@hotmail.com).

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