selected from an Elizabeth Warren fundraiser; or from a barbeque in Texas versus a wine tasting in Napa; or even (God forbid) from a gaggle of cardiologists versus a pride of cardiac surgeons. How mind-bending is the step from Bacon and Hegel and William James to our current state of scientific inquiry nestled within the comfortable confines of the *Journal*?

In the accompanying manuscript, after carving the thousands of investigations down to a bite-sized 7, the authors note that in 6 of the 7 the confidence limits statistically favor surgery and in aggregate they document a 1.7-fold superiority of surgical ablation. The authors note that they were using a strategy that prioritize “sensitivity” over “precision” maximizing. Kierkegaard would have smiled at their recognition of “subjectivity” and that “feelings do matter!” The

American Association for Thoracic Surgery and the Society of Thoracic Surgeons have consistently favored surgery with a Class I recommendation. Currently, with identical data available, the Heart Rhythm Society and the American Heart Association/American College of Cardiology (confidently applying the traditional “I want my kid to win” philosophy) have wobbled back and forth with surgery as Class I and IIa recommendations. What’s going on? Is it OK for us to draw the bull’s eye around the tip of our arrow after we have shot and hit the barn door?

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Commentary: Achieving success after ablation for atrial fibrillation: It's what you do and not how you do it

Harold L. Lazar, MD

In this edition of the *Journal*, Huang and co-workers¹ report the results of a meta-analysis comparing the absence of atrial fibrillation (AF) over a 12-month period without anti-arrhythmic medications in patients undergoing catheter ablation (CA) versus surgical ablation (SA). They concluded that SA “conferred a moderate advantage” over CA in patients with paroxysmal AF and persistent long-standing AF. The meta-analysis consisted of 7 randomized controlled trials (RCTs) involving 583 patients. The SA group had 6 studies in which pulmonary vein isolation (PVI) was performed using thoracoscopic techniques. In 1

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Achieving success after ablation for AF is dependent on what lesion sets you do and not how you do them.

trial, patients were randomized to CA or SA 6 months after

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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 May 14, 2020; accepted for publication May 14, 2020; available ahead of print June 5, 2020.

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J Thorac Cardiovasc Surg 2022;163:997-9

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2020.05.069>

valve surgery. All lesion sets were performed using radio-frequency (RF) techniques. None of the patients had a full Cox Maze IV lesion set involving the right atrium (RA) and left atrium (LA), and no mention is made of the use of LA appendage (LAA) ablation techniques. Femoral vascular complications were more common in patients receiving CA, and there was a higher incidence of pneumothorax in the SA group. There was no difference in

mortality, strokes, and new permanent pacemaker insertion between the groups.

There are numerous limitations in this meta-analysis. The 3-month blanking period was reported in only 5 of the 7 RCTs. Although all the studies had PVI lesion sets, additional lesion sets were variable. Follow-up rhythm detection was not uniform. In 4 RCTs, Holter monitoring was performed at discrete time intervals, and 3 RCTs used implantable loop recorders. The actual percentage of patients with recurrent AF in each arm of each RCT is not reported. As previously noted, no mention is made as to the exclusion or excision of the LAA, which should always be part of any ablative procedure. Perhaps the most glaring limitation was the omission of the only SA procedure ever approved by the Food and Drug Administration for the surgical treatment of AF, the procedure now considered the “gold standard” for the treatment of AF for which all other ablative techniques, CA or SA, should be compared with: the Cox Maze IV procedure. How then can we use the results from this meta-analysis in our clinical practices? Unfortunately, this meta-analysis does not provide any new information regarding ablation therapy for AF.

The goals for any AF ablation therapy are to achieve a high rate of freedom from recurrent AF in the absence of anticoagulation and antiarrhythmic therapy, to decrease the long-term risk of stroke, and to improve survival. Although PVI has been the cornerstone of all AF ablation techniques, both CA and SA, ablation of non-PVI sites in both the RA and LA, are now recognized as important strategies for curing all types of AF. Ablation therapy for AF is constantly changing. It is no longer a question of CA versus SA. The focus is now on the best method to achieve those RA and LA lesion sets along with LA appendage ablation that are routinely performed with the Cox Maze IV procedure. Although it is reasonable to perform a stand-alone, off-pump SA for PVI in patients with symptomatic, paroxysmal AF, and a small LA (currently a Class IIA American Association for Thoracic Surgery guideline),² off-pump thoracoscopic PVI procedures for all types of AF have resulted in poor long-term outcomes with freedom from recurrent AF at 5 years ranging from 38% to 11%.³⁻⁵ Furthermore, when patients require conversion from thoracoscopic off-pump procedures, there is a significant increase in the incidence of stroke and mortality.⁴ Only the Cox Maze IV lesion set, combined with LAA ablation, offers the most optimal long-term freedom from recurrent AF, which has been reported to be as high as 80% at 10-year follow-up in patients undergoing a stand-alone Cox Maze IV procedure.⁶

Can Cox Maze IV lesions be performed using minimally invasive catheter and surgical techniques to avoid cardiopulmonary bypass? Cox and co-workers⁷ recently described a hybrid Maze procedure that incorporates the

Cox Maze IV lesion set using a combination of catheter and off-pump surgical techniques. The initial thoracoscopic SA consists of a PVI box lesion, a left superior vein to LAA lesion, an AtriClip (AtriCure, Mason, Ohio) on the LAA, and 2 RA lesions—a lesion between the orifices of the SVC and IVC and a lesion from the lower portion of the intercaval lesion to the tip of the RA appendage. After the 3-month blanking period, a follow-up CA is performed to “touch up” any gaps from the original SA lesions and create a lesion across the cavotricuspid isthmus in the atrial myocardium and a coronary sinus line in the same plane as the mitral line for those 10% to 15% of patients with spontaneous mitral flutter during the blanking period or in those patients in whom perimitral flutter can be induced during the follow-up CA procedure. More data will be needed to determine the results from this combined CA + SA Cox Maze IV lesion set and how it compares with long-term outcomes and the morbidity associated with current open on-pump Cox Maze IV techniques.

Achieving success after ablation for AF is also dependent on patient selection. Patients who have already developed significant alterations in cardiac structure and function, such as LA enlargement, stiffness, and fibrosis, left ventricular hypertrophy, and decreased left ventricular compliance; patients with concomitant valve and coronary disease; and patients with long-standing, persistent AF (>5 years) are less likely to benefit from an ablative procedure.⁸⁻¹⁰ In contrast, modification of diseases such as obstructive sleep apnea, metabolic syndrome, and diabetes may decrease the incidence of recurrent AF after ablative procedures. Donnellan and co-workers¹¹ found that in diabetic patients undergoing CA for AF using a PVI lesion set, patients with a hemoglobin A1c (HbA1c) greater than 9% at the time of the ablation had double the recurrence of AF compared with patients with an HbA1c less than 7% (68% vs 32%; $P < .0001$).¹¹ Achieving better glycemic control by decreasing HbA1c greater than 10% from the baseline significantly decreased the rate of recurrent AF. Achieving better control of hypertension using angiotensin receptor blockers, weight loss, and smoking cessation have also been found to decrease the recurrence of AF after ablative procedures.¹²⁻¹⁴

In summary, achieving success after ablation for AF is dependent on what lesion sets you do and not how you do them.

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Commentary: Head-to-head or head-to-toe

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

In this edition of the *Journal*, Huang and colleagues¹ present a meta-analysis of randomized trials comparing catheter ablation (CA) with surgical ablation (SA) for the treatment of atrial fibrillation (AF). The key finding was a moderate advantage of SA in achieving success at 1 year, in accordance with the 2017 multisociety consensus statement definition of success as freedom from AF without the use of antiarrhythmic drugs.² Findings persisted in subgroup analysis. The secondary end point of safety outcomes was similar for the procedures, except for vascular injury being higher with CA (odds ratio, 5.81) and pneumothorax being lower with CA (odds ratio, 0.09). In both their

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

CENTRAL MESSAGE

Head-to-head comparisons of CA and SA for AF traditionally have not been considered in the guidelines. A meta-analysis of randomized trials adds to the evidence.

In Introduction and Discussion, the authors discuss the several multisociety guidelines and consensus statements, focusing on the relative class of recommendations (COR) for SA and CA. Specifically, they “infer that a lower class of recommendation for SA by the...guidelines may lead to the underuse of SA.” In light of their new meta-analysis findings, this may be a valid concern. However, a brief historical review of the evolution and evidence underlying ablation

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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 May 18, 2020; accepted for publication May 18, 2020; available ahead of print June 5, 2020.

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J Thorac Cardiovasc Surg 2022;163:999-1001

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2020.05.065>