

Commentary: Is surgical ablation concomitant with coronary artery bypass grafting cost effective? No answers, just questions



Vijay S. Patel, MD, and Richard Lee, MD, MBA

From the Division of Cardiothoracic Surgery, Department of Surgery, Medical College of Georgia, Augusta University, Augusta, Ga.

Disclosures: Authors have nothing to disclose with regard to commercial support.

Received for publication Aug 1, 2019; accepted for publication Aug 1, 2019; available ahead of print Sept 5, 2019.

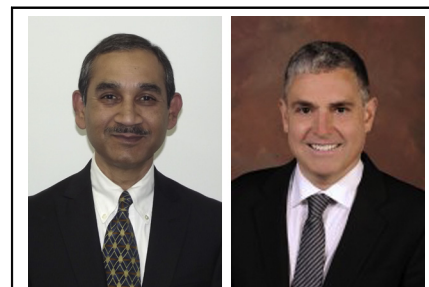
Address for reprints: Richard Lee, MD, MBA, Division of Cardiothoracic Surgery, Department of Surgery, Medical College of Georgia, Augusta University, 1120 15th St, BA 4300, Augusta, GA 30912 (E-mail: ricklee@augusta.edu).

J Thorac Cardiovasc Surg 2020;160:689-90

0022-5223/\$36.00

Copyright © 2019 Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery

<https://doi.org/10.1016/j.jtcvs.2019.08.010>



Vijay S. Patel, MD (left), and Richard Lee, MD, MBA (right)

Central Message

The cost-effectiveness of concomitant surgical ablation remains undefined, despite growing evidence for its perioperative and midterm to long-term morbidity and mortality benefits.

See Article page 675.

It is nearly 2020, and atrial fibrillation (AF) remains a critical problem and an opportunity in cardiac surgery. AF is the most common preoperative arrhythmia in cardiac surgical patients and carries a significant independent risk of negative perioperative and long term morbidity and mortality outcomes compared with patients without preoperative AF.^{1,2} Growing evidence suggests that concomitant surgical ablation (CSA) may mitigate these perioperative and long-term risks without increasing operative risks.³ Recent society guidelines have responded and now recommend more aggressive CSA intervention for appropriate patients.^{4,5} Despite these findings and recommendations, adoption among surgeons is slow, albeit improving.⁶ The latter is due in part to ongoing debate related to gaps in our understanding of the long-term impact of CSA with coronary artery bypass grafting (CABG) including lack of large multicenter randomized controlled trials.^{7,8} In addition, there is a lack of convincing evidence to demonstrate the procedure-related cost-effectiveness and its longitudinal impact on reduced overall medical care costs.

The article in this issue of the *Journal* by Rankin and colleagues,⁹ “Surgical Ablation of Atrial Fibrillation Concomitant to Coronary Artery Bypass Grafting Provides Cost-Effective Mortality Reduction,” is an effort to fill in the void. This observational study provides a 2-year follow-up for their previously published report analyzing mortality and costs at 1 year associated with CSA of AF during the index hospitalization for CABG. Both studies examined the same cohort of Medicare beneficiaries with preoperative AF who underwent CABG with and without CSA in 2013.¹⁰ The higher initial financial costs for the CSA group in the first year were offset by reduced inpatient and outpatient costs relative to the no-CSA group during the next 2 years, and Rankin and colleagues⁹ conclude that CSA with CABG can be a cost-effective treatment in the

long term, with improvement in risk-adjusted late mortality benefit for the CSA group.

At first glance, the analysis and findings of Rankin and colleagues⁹ appear to be encouraging, lending incremental support in favor of CSA intervention for a presumed reduction in the future cost of medical care and improved mortality. Nevertheless, closer scrutiny of their report highlights significant limitations.

It must be emphasized that use of the Medicare administrative database inherently lacks exhaustive clinically relevant data with desired specificity, and important information valuable to this investigation cannot reliably be assured in the absence of explicit details for all future readmissions, outpatient services, and interventions. These deficiencies can significantly underestimate the financial analysis. Moreover, since there was a positive impact on survival, presumably there should be more readmissions among the sicker AF-treated survivors than among the non-treated deceased. Although clearly an advantage for the survivors, CSA treatment may and should be relatively *more* expensive. This type of analysis is critical in assessing the cost to benefit ratio of any intervention.

The inherent selection bias makes it nearly impossible to interpret the results. Only 17% of the patients received CSA. The untreated group had significantly higher comorbidities and predispositions to readmission, such as

congestive heart failure, renal failure, and lung disease. This likely influenced negative long-term outcomes for the untreated high-risk group relative to the low-risk CSA group. Moreover, the “healthier” treated patients should theoretically be much less expensive if there were a benefit to therapy. The fact that the price is the same suggests that it may be relatively *more* expensive (if the patients were appropriately adjusted).

Further, the article is also deficient in the tabulation of several critical factors, including perioperative morbidities, details of the CSA procedures, successful attainment of sinus rhythm, the specific cause of mortality, and improvement in the quality of life measures. In addition, it fails to compare the entire AF group and a no preoperative AF CABG group, which would provide invaluable insight into the relative impact of the AF on outcomes—if any.

This article by Rankin and colleagues⁹ provides an important early step on the path to understanding the effects of treating AF on long-term patient outcomes. Unfortunately, after we read it, we find no answers, merely more questions.

References

1. Saxena A, Virk SA, Bowman S, Chan L, Jeremy R, Bannon PG. Preoperative atrial fibrillation portends poor outcomes after coronary artery bypass graft surgery: a systematic review and meta-analysis. *J Thorac Cardiovasc Surg.* 2018;155:1524-33.e2.
2. Malaisrie SC, McCarthy PM, Kruse J, Matsouka R, Andrei AC, Grau-Sepulveda MV, et al. Burden of preoperative atrial fibrillation in patients undergoing coronary artery bypass grafting. *J Thorac Cardiovasc Surg.* 2018;155:2358-67.e1.
3. Lee R, McCarthy PM, Wang EC, Vaduganathan M, Kruse J, Malaisrie SC, et al. Midterm survival in patients treated for atrial fibrillation: a propensity-matched comparison to patients without a history of atrial fibrillation. *J Thorac Cardiovasc Surg.* 2012;143:1341-51.
4. Badhwar V, Rankin JS, Damiano RJ Jr, Gillinov AM, Bakaen FG, Edgerton JR, et al. The Society of Thoracic Surgeons 2017 clinical practice guidelines for the surgical treatment of atrial fibrillation. *Ann Thorac Surg.* 2017;103:329-41.
5. Ad N, Damiano RJ Jr, Badhwar V, Calkins H, La Meir M, Nitta T, et al. Expert consensus guidelines: examining surgical ablation for atrial fibrillation. *J Thorac Cardiovasc Surg.* 2017;153:1330-54.e1.
6. Badhwar V, Rankin S, Ad N, Grau-Sepulveda M, Damiano RJ, Gillinov AM, et al. Surgical ablation of atrial fibrillation in the United States: trends and propensity matched outcomes. *Ann Thorac Surg.* 2017;104:493-500.
7. McCarthy PM. We don't know what we need to know about atrial fibrillation. *J Thorac Cardiovasc Surg.* 2018;155:1522-3.
8. Nashef SAM, Abu-Omar Y. Concomitant atrial fibrillation: worth the effort? *Eur J Cardiothorac Surg.* 2018;53:i14-8.
9. Rankin JS, Lerner DJ, Braid-Forbes MJ, McCrean ML, Badhwar V. Surgical ablation of atrial fibrillation concomitant to coronary-artery bypass grafting provides cost-effective mortality reduction. *J Thorac Cardiovasc Surg.* 2020;160:675-86.e13.
10. Rankin JS, Lerner DJ, Braid-Forbes MJ, Ferguson MA, Badhwar V. One-year mortality and costs associated with surgical ablation for atrial fibrillation concomitant to coronary artery bypass grafting. *Eur J Cardiothorac Surg.* 2017;52:471-7.