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Commentary: Surgical ablation—Just do it!

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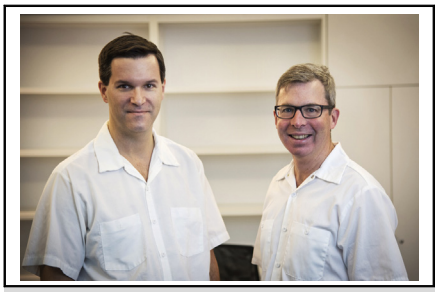

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CENTRAL MESSAGE

Concomitant surgical ablation should be performed in virtually all patients with preexisting atrial fibrillation undergoing coronary artery bypass grafting.

There is incontrovertible evidence that cardiac surgery patients with atrial fibrillation (AF) face increased risks of stroke and death, and that surgical ablation successfully treats the heart rhythm in the majority of cases.[1-3] The major knowledge gap in the field of surgical ablation centers on the long-term clinical impact of concomitant surgical ablation. Does surgical ablation reduce the late risks of stroke and death? A definitive answer to this question would require a large, randomized controlled trial with long-term follow-up. It is unlikely that such a trial will ever be completed, and thus we must turn to observational studies for insight. Although such studies cannot establish causality, they do provide persuasive data to inform clinical decision making.

Using the Medicare-linked Society of Thoracic Surgeons (STS) database, Malaisrie and colleagues[4] analyzed the impact of concomitant surgical ablation in patients with preoperative AF who underwent coronary artery bypass grafting (CABG). Their primary findings were that concomitant ablation was associated with lower risks of stroke and mortality in those who survived for longer than 2 years, and that concomitant ablation was associated with slight increases in perioperative morbidity and mortality, with this effect limited to those with a very high CHA_2DS_2-VASc score. The improved long-term outcomes should encourage surgeons to perform ablation, whereas the increased perioperative risk may engender some pause in selected patients.

Overall, a risk-benefit analysis favors ablation in nearly all CABG recipients with preexisting AF. Previous studies have not identified increased perioperative risk attributable to surgical ablation,[5,6] at odds with the findings of Malaisrie and colleagues. Therefore, while it might be reasonable to withhold ablation in the very sickest patients, the preponderance of evidence suggests that surgeons should consider concomitant ablation in all CABG recipients with AF.

Limitations in the dataset prevented analysis of the type of ablation (ie, lesion set). For this reason, until now, we have used the term "ablation" rather than "maze procedure" or "Cox-maze IV procedure" in this commentary. In the study by Malaisrie and colleagues, concomitant ablation was associated with an increased cardiopulmonary bypass time of only 18 minutes compared with no ablation. This suggests that most patients did not receive a full Cox-maze IV lesion set, given that creation of that biatrial lesion set usually takes longer than 20 minutes. This raises an important question: Would results have been better with a Cox-maze IV lesion set (a "real" maze procedure)? The answer to this question is likely "yes." Therefore, it is quite possible that this study underestimates the positive clinical impact of concomitant ablation in patients undergoing CABG.

The data in this study support surgical ablation in CABG patients with AF. Previous studies have confirmed the superior effectiveness of the Cox-maze IV lesion set compared with other lesion sets. Therefore, we strongly recommend that CABG patients with AF receive a Cox-maze IV.

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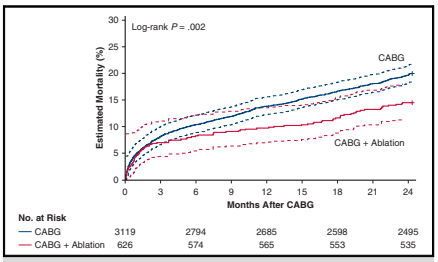
Commentary: Questionable statistical routines

J. Scott Rankin, MD

There are no routine statistical questions, only questionable statistical routines

—Sir David R. Cox

In this issue of the *Journal*, Malaisrie and colleagues[2] analyzed Medicare outcome data in 34,600 patients with atrial fibrillation undergoing coronary artery bypass grafting from 2006 to 2013. In total, 10,541 (30.5%) had surgical ablation (SA) and 23,059 (69.5%) did not. On average, patients with atrial fibrillation and no SA had greater risk profiles. Using propensity matching techniques, the authors compared 9771 matched pairs of SA versus no SA. Thus, 15,058 (or 44%) of overall patients were omitted from the analysis, and importantly, the prognostic effects of the majority of the greater-risk no-SA group (13,288 or 58%) were removed from consideration. The mathematical effect would be to underestimate the detrimental effects of no-SA in the analysis. An extreme example of this problem is a bariatric surgery propensity study, which has been criticized for omitting 90% of the population and overlooking a significant treatment effect.[3]



Piecewise Cox model of 2013 Medicare beneficiaries having CABG with/without AF ablation.[1]

CENTRAL MESSAGE

Hazard ratio for mortality was no different in the first 90 days after CABG (HR, 1.03 [0.74-1.43]), but after 90 days, ablation patients experienced lower risk-adjusted mortality (HR, 0.71 [0.52-0.97]).

No perfect clinical research technique exists. All observational methods have advantages and disadvantages. Propensity matching is a useful approach that can control for imbalances in baseline patient characteristics.[4] First, the probability of treatment assignment is modeled by regression analysis of observed covariates, and the model is used to balance the treatment groups for risk factors. However, the data reduction can hide outcome heterogeneity, and failure to compensate by also adjusting for baseline covariates can result in a bias in the treatment effect toward a hazard ratio of 1.0. Choice of the matching algorithm also is arbitrary,[4] usually depending on the order of observations and creating a type of nonreproducibility. Nonmatched observations are discarded, reducing precision and power. Matching not only rejects hard-to-match observations, but

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