Cox Maze IV procedure is effective, but is it for everybody?

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It is well known that atrial fibrillation (AF) is a bad actor if left untreated, adversely affecting the short- and long-term outcomes of cardiac surgical patients.^{1,2} The Cox Maze (CM) operation introduced by Dr James Cox in 1987 at the authors' institution³ is the gold standard for surgical treatment of AF. Substituting the cut-and-sew technique with alternative energy sources, the CM IV is the current established and effective procedure for the treatment of AF. Under the leadership of the senior author, this group has continued to report on various aspects of the CM IV in different groups of patients. The current report is their latest on the long-term survival of patients undergoing concomitant CM IV procedure demonstrating the efficacy of CM IV.⁴ Beyond its message, however, there are several considerations worth highlighting.

Despite the large sample size, the report is noteworthy for the number of patients who did not undergo the CM IV. The CM IV group was a highly selected group, because it constituted only 22% of all patients with AF (#1948) undergoing cardiac surgery during the study period from 2001 to 2016. Although propensity matching was performed to overcome the shortcomings of a retrospective review, it is a bit surprising to see that at a center that is the birthplace of the Maze operation and is known for its expertise in the management of such patients, the majority of patients with AF did not undergo a concomitant CM IV. By all likelihood, most of the patients who received the CM IV were treated by the senior author, and thus, the factors of expertise and selection bias.

The Cardiothoracic Surgical Trial Network randomized trial⁵ showed the effectiveness of surgical ablation concomitant with mitral valve surgery in freedom from AF at 1 year compared with the no ablation group with no major differences in major adverse cardiac and cerebrovascular events, mortality, hospital readmissions, or freedom from AF between the CM IV and pulmonary vein ablation. The trial found a similar success rate between CM IV and pulmonary vein ablation at 1 year. The untreated patients with AF in the current study had a higher risk profile and thus were not considered suitable for a concomitant CM IV. Also, patients undergoing

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Central Message

Not all patients with AF are candidates for the Cox Maze IV.

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non-CM IV ablation procedures were excluded, and the question of whether a lesser ablative procedure such as pulmonary vein isolation or left atrial appendage exclusion would have improved the long-term survival for the untreated patients with AF remains unanswered.

Despite the lack of information on patients' rhythm in this report, the message is clear: Performance of CM IV concomitant with other cardiac surgery procedures positively affects the long-term survival of patients. This is an encouraging message for surgeons to consider concomitant CM IV in appropriate patients with AF undergoing cardiac surgery. Future efforts should focus on the much larger untreated AF group in finding alternative strategies that would lead to improvement in long-term survival. I commend the authors for their continued contributions to the surgical treatment of AF.

References

1. Saxena A, Virk SA, Bowman S. Systematic review and meta-analysis on the impact of pre-operative atrial fibrillation on short- and long-term outcomes after aortic valve replacement. *J Cardiovasc Surg (Torino)*. 2017;58:943-50.
2. Ngaage DL, Schaff HV, Mullany CJ, Sundt TM III, Dearani JA, Barnes S, et al. Does preoperative atrial fibrillation influence early and late outcomes of coronary artery bypass grafting? *J Thorac Cardiovasc Surg*. 2007;133:182-9.
3. Cox JL, Schuessler RB, D'Agostino HJ Jr, Stone CM, Chang BC, Cain ME, et al. The surgical treatment of atrial fibrillation. III. Development of a definite surgical procedure. *J Thorac Cardiovasc Surg*. 1991;101:569-83.
4. Musharbash FN, Schill MR, Sinn LA, Schuessler RB, Maniar HS, Moon MR, et al. Performance of the Cox-Maze IV procedure is associated with improved long-term survival in patients with atrial fibrillation undergoing cardiac surgery: a propensity matched study. *J Thorac Cardiovasc Surg*. 2018;155:159-70.
5. Gillinov AM, Gelijns AC, Parides MK, DeRose JJ Jr, Moskowitz AJ, Voisine P, et al. Surgical ablation of atrial fibrillation during mitral-valve surgery. *N Engl J Med*. 2015;372:1399-409.