Editorial

Surgical treatment of atrial fibrillation—what have we learned?

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Numerous challenges were overcome to develop an effective approach to the surgical treatment of atrial fibrillation (AF), the end result of which was the Cox-maze III procedure (1). Evaluation of outcomes following this procedure was facilitated by the consistency in lesion sets and guaranteed transmurality. Furthermore, since its inception, it has served as the foundation for the further development and evolution of contemporary techniques for surgical ablation of AF.

In the current era, newer ablative energy sources, minimally-invasive approaches and alternate lesion sets have largely replaced the Cox-maze III operation in order to simplify surgical options for patients (2). As an unintended consequence, the rigorous and systematic evaluation of rhythm outcomes has become extremely challenging and the literature is plagued by significant heterogeneity. In contradistinction to the first 15 years of surgical AF ablation since the first Cox-maze procedure was performed in 1987, disagreement now exists regarding the optimal approach, and while consensus statements (3,4) have attempted to standardize practices, lack of uniformity remains and assessment is complicated.

In this context, Gillinov and associates should be congratulated for attempting to address the need for rigorously controlled, prospective trials evaluating AF ablation in their report recently published in the *New England Journal of Medicine* (5). The investigators observed a significantly higher freedom from AF in patients who underwent concomitant AF ablation during mitral valve surgery in patients with long-standing persistent or persistent AF compared to those without ablation. The risk of permanent pacemaker implantation was also significantly higher in the ablation group. In the aftermath of this clinical trial, however, we are left with very little clarity due to limitations in the study population and design. In addition, many clinical data were absent including technical details of the cryoablation, indications for permanent pacemaker, and anticoagulant/antiarrhythmic medication strategies employed during follow-up. The decision to include both longstanding persistent and persistent AF patients together introduces heterogeneity as the nature of the AF present in each group can be significantly disparate. In addition, the allowance of so many additional concomitant non-ablative procedures also hinders the reader's ability to interpret the outcomes that were observed.

The major question facing surgeons is what patients will benefit from concomitant AF ablation during valve surgery. Safety of concomitant AF ablation has been evaluated thoroughly and while ablation of AF is a major goal, the long-term clinical benefit to the patient is also at the forefront of the decision to add this cardiac surgical procedure. Unfortunately, this question was not able to be answered with the current study design. However, the finding of similar quality of life between study cohorts can be explained largely by an older study patient population undergoing a significant number of valve replacements in whom quality of life is likely more driven by response to correction of valve disease rather than freedom from AF. In addition, the finding of similar stroke rates between study groups is largely explained by the fact that patients who did not undergo ablation also had left atrial appendectomy and anticoagulation with warfarin. Interpreting the clinical benefit from AF ablation in this trial is difficult as it has been reported.

The surgical community will readily acknowledge the barriers and difficulties encountered attempting to conduct surgical clinical trials, so, in this vain, this study by Gillinov and associates marks a valiant achievement, however, its impact on clinical practice remains to be seen. Arguably the greatest impact of these findings will be to continue to emphasize the ongoing importance of clinical trials so

that we can better refine the selection of patients who may benefit from AF ablation. The largest of these such patients include those who have severe symptoms from their atrial tachyarrhythmia and those undergoing mitral valve repair in whom the ablation of AF could potentially rid the need for anticoagulation if sinus rhythm were restored. It is encouraging in this trial that there is not even a trend toward any worsening in morbidity or mortality when these potentially helpful procedures are employed.

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Footnote

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