The atrial fibrillation prescription

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Central Message

In cardiac surgical patients with atrial fibrillation, the Cox-Maze IV procedure provides rhythm control and increases long-term survival. There is only one remaining mystery concerning this procedure: why are surgeons reluctant to use it?

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When Dr James Cox devised the Cox-Maze III procedure, he presented cardiac surgeons with a remarkably effective operation that was based on extensive scientific inquiry and experimentation. Although clinical series quickly confirmed excellent operative results, uptake by surgeons was remarkably slow. Surgeons' reluctance to perform the operation was understandable; the cut-and-sew Cox-Maze III procedure was both complex and time-consuming. The majority of surgeons glanced at diagrams depicting the lesion sets and decided not to add this extensive undertaking to the patient's primary valve or coronary artery surgery. At that time, this choice was reasonable. In contrast, the decision to forego surgical ablation in contemporary practice is far more difficult to understand, and the work of Musharbash and colleagues¹ in this issue of the *Journal* lends further support to the imperative that we broaden our application of surgical ablation.

THE BENEFITS OF SURGICAL ABLATION

Cardiac surgeons operate to save lives. Patients with aortic stenosis, mitral regurgitation, and coronary artery disease live longer after a successful operation. Musharbash and colleagues¹ demonstrate that the same holds true for patients with atrial fibrillation; long-term survival is improved by concomitant surgical ablation. This finding echoes previous reports.² In addition to its favorable impact on survival, ablation has been associated with decreased risk of stroke, reduced need for long-term anticoagulation and the attendant risk of bleeding, and improved quality of life.³ These benefits likely stem from a combination of rhythm control and management of the left atrial appendage. Although this particular study does not address heart rhythm after surgical ablation, previous reports from this group and others confirm 5-year freedom from atrial fibrillation in the range of 70% to 80%.⁴ In short, the operation is effective at controlling heart rhythm and beneficial in its clinical effects.

THE RISKS OF SURGICAL ABLATION

Surgical ablation is a safe procedure. Although a Cox-Maze IV procedure adds 20 to 40 minutes to the aortic

crossclamp time, this is generally well tolerated. Confirming previous results, the authors of this study found no increase in major morbidity or mortality in patients who received surgical ablation. Nonetheless, surgical ablation does have some costs. Compared with patients whose atrial fibrillation was left untreated, patients undergoing surgical ablation were more likely to receive a permanent pacemaker and to have longer intensive care unit and hospital lengths of stay. Although these costs cannot be considered negligible, the clinical benefits of surgical ablation far outweigh these factors.

THE OPERATION

Musharbash and colleagues¹ report the results achieved with a standardized approach to ablation: the Cox-Maze IV. As they note, this operation represents the current gold standard for surgical ablation. Incorporating bipolar radiofrequency and/or cryotherapy, the biatrial lesion set of the Cox-Maze IV procedure produces the benefits enumerated earlier. It is unclear whether other procedures, particularly pulmonary vein isolation alone, confer the same benefits to the patient. Therefore, surgeons' default should be the energy-assisted, biatrial lesion set of the Cox-Maze IV.

THE MYSTERY

According to the Society of Thoracic Surgeons database, fewer than one half of cardiac surgery patients with atrial fibrillation undergo concomitant ablation.⁵ In fact, in the

current series from Washington University, only one quarter of patients with preexisting atrial fibrillation had ablation. Surgeons clearly use some sort of selection process in patients with atrial fibrillation, and, in the majority of patients, elect to forego ablation. Herein lies the real mystery with surgical ablation. Most of the questions concerning safety, effectiveness, and clinical benefits have been answered. The remaining question is this: why don't surgeons do this operation more frequently?

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