

Finally, the technical prowess of the senior surgeon in this series notwithstanding, the rationale for using the cut-and-sew CM-III instead of the equally efficacious CM-IV with cryotherapy is questionable, given its increased technical demands. It is not likely that many surgeons could replicate the alacrity and brief clamp times with the CM-III documented in this report.<sup>2</sup> High-volume centers report outcomes of CM-IV comparable to those of the cut-and-sew CM-III,<sup>4,6,7</sup> and more surgeons would be inclined to use a comprehensive biatrial lesion set with a concomitant CM-IV procedure than a cut-and-sew CM-III.

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## Commentary: Navigating the maze of ablation

Dawn S. Hui, MD,<sup>a</sup> and Richard Lee, MD, MBA<sup>b</sup>



Richard Lee, MD, MBA, and Dawn S. Hui, MD

Over the last decade, there has been growing evidence for the safety and efficacy of surgical ablation to treat atrial fibrillation (AF) at the time of correction of other cardiac lesions. In one of the largest concomitant ablation studies, successful restoration of sinus rhythm was associated with improved midterm survival.<sup>1</sup> Concomitant AF ablation in mitral regurgitation (MR) has been particularly well studied, due to the association of AF with degenerative MR, with an incidence of 30% to 40% at first diagnosis in asymptomatic patients<sup>2</sup> and >40% 10-year incidence of

**CENTRAL MESSAGE**

A study of concomitant ablation for atrial fibrillation in septal myectomy demonstrates the safety of the operation, but association with a survival benefit remains an open question.

From the <sup>a</sup>Department of Cardiothoracic Surgery, University of Texas Health Science Center at San Antonio, San Antonio, Tex; and <sup>b</sup>Division of Cardiothoracic Surgery, Department of Surgery, Medical College of Georgia, Augusta University, Augusta, Ga.

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Address for reprints: Dawn S. Hui, MD, 7703 Floyd Curl Dr, Suite 211L, San Antonio, TX 78229 (E-mail: [huid@uthscsa.edu](mailto:huid@uthscsa.edu)).

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new-onset AF for those initially presenting in sinus rhythm.<sup>3</sup> Hypertrophic cardiomyopathy (HCM) adds another layer of complexity, with several other potential substrates for AF, of which MR-related left atrial enlargement is only one. In these patients, concomitant surgical ablation is a not-infrequent question, with the incidence of preoperative AF being 1 in 5. Unlike other cardiac operations, the data on safety and efficacy have been lacking.

In this edition of the *Journal*, Cui and colleagues<sup>4</sup> present 15 years of concomitant AF ablation at the time of septal myectomy. They are one of the few centers with HCM experience and expertise to address this knowledge gap. Excellent perioperative results supported the safety of this procedure. Notably, not all patients with preoperative AF underwent ablation. This allowed comparisons of treatment with no treatment, although the ablation rate differed by AF subtype (80% for persistent, 52% for recurrent paroxysmal, and 15% for single-episode). The relatively large number of patients in this cohort facilitated subgroup analyses to examine the question from several stances. For example, the advanced fibrosis and myocardial thickening characteristic of HCM has led to a change in the authors' practice, from pulmonary vein isolation to a Cox-Maze III (cut-and-sew) approach. By technique, survival curves diverged significantly (Figure 3 in the study), with a hazard ratio for Cox-Maze III of 0.37. However, the lack of statistical significance ( $P = .127$ ) may reflect an underpowered analysis in these subgroups. The question of the best ablative technique for transmural ablation in HCM has implications in an era in which Cox-Maze IV has supplanted the cut-and-sew technique and been reported in patients with HCM with only 78% success at 2 years.<sup>5</sup>

In the entire HCM cohort, pre-existing AF portended a worse survival (hazard ratio, 1.36) with survival curves separating after year 5. The reasons for this late separation are ambiguous and unfortunately can only be speculated. Like many studies of AF ablation, this study lacked important parameters, such as late freedom from atrial tachyarrhythmias and antiarrhythmics, cardiovascular events including cerebral thromboembolism, subsequent catheter-based ablation, and cause of death. Further, adjusted analysis did not demonstrate a significant survival difference in AF-ablated versus AF-not ablated groups. This is in

contrast to the late survival benefit demonstrated in mitral and coronary artery bypass operations.<sup>6-8</sup> The key may lie in the distinction between treatment and efficacy: as Lee and colleagues<sup>1</sup> demonstrated, it is the success of ablation, not ablation alone, that impacts survival. It is possible that unique cardiac sequelae of HCM may mitigate the efficacy of ablative therapies and thus survival benefit. Key questions to answer include optimal techniques and lesion sets, long-term ablation success rates, and late thromboembolic events. The study of Cui and colleagues, in demonstrating the safety of this operation, opens the door to future studies to address these questions.

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