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Commentary: Cox maze with septal myectomy

Harold G. Roberts, Jr, MD, Lawrence M. Wei, MD, and Vinay Badhwar, MD

Hypertrophic cardiomyopathy (HCM) with obstruction is recognized as one of the most common causes of nontraumatic sudden death, following its first description in 1958.¹ Since Morrow's pioneering work more than 50 years ago, many high-volume centers have reported a salutary impact of septal myectomy (SM) on symptoms and long-term outcomes in patients with HCM. Atrial fibrillation (AF) is the most common arrhythmia occurring in patients with HCM and is poorly tolerated, owing to the inherent tachycardia and impaired filling of the hypertrophic left ventricle that lacks diastolic compliance.

In this issue of the *Journal*, Cui and colleagues² present the Mayo Clinic experience with this challenging cohort of patients. Over a 15-year period, a total of 2023 patients underwent SM. Of these, 394 patients had a preoperative history of AF, including 354 with paroxysmal AF (PAF) and the remaining 40 with persistent AF. Almost one-half (48%) underwent concomitant surgical ablation (SA), with 148 undergoing pulmonary vein isolation (PVI) and 42 undergoing a classic cut-and-sew Cox maze (CM)-III. Excellent results with nearly negligible morbidity and mortality were achieved with longitudinal outcomes out to 5.6 years. After multivariate adjustment for comorbidities, the main findings were that HCM patients with AF had an increased hazard rate of mortality, and AF patients treated with SA had an improved survival in those followed for longer than 5 years. These findings add to the growing and consistent literature demonstrating improved survival with concomitant SA.^{3,4}

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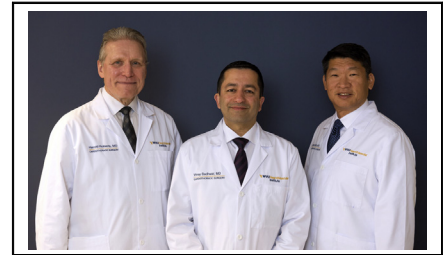
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CENTRAL MESSAGE

Surgical ablation with septal myectomy improves survival of patients with hypertrophic cardiomyopathy and atrial fibrillation. The Cox maze (CM)-IV procedure provides comparable results to CM-III.

The authors' institution has one of the largest series of patients undergoing SA for obstructive HCM and has contributed significantly to current understanding of the disease and its treatment. However, a few concerns regarding this study may be raised. Although 394 patients in this series had a history of AF, only 190 (48%) had concomitant SA. The authors support this practice with the rationale that most of their untreated patients had only 1 episode of AF. Nevertheless, a recent study by Rowin and colleagues⁵ found that 27% of their patients with embolic stroke presented during the first episode of AF, and that the CHA2DS-VASc was unreliable in predicting which HCM/AF patients require anticoagulation.⁵

Whether SM alone, with its elimination of septal anterior motion and mitral regurgitation sufficiently subdues preoperative PAF is unknown. Considering the authors' findings of improved survival with SA, a more aggressive stance toward preoperative AF appears warranted.

Nearly 80% of the patients undergoing SA in this series had PVI. Even though there was a trend toward better control of the AF burden with CM-III, the authors favored PVI for the majority of their HCM/PAF patients, hypothesizing that it has less traumatic impact on left atrial transport. A counter argument could be made that overall left atrial transport is better with CM-III or IV by virtue of superior reduction of AF burden. We believe that the finding of improved survival with SA would be even more accentuated if more patients underwent CM-III instead of PVI.

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.² High-volume centers report outcomes of CM-IV comparable to those of the cut-and-sew CM-III,^{4,6,7} 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.

References

1. Maron BJ, Rowin EJ, Casey SA, Maron MS. How hypertrophic cardiomyopathy became a contemporary treatable genetic disease with low mortality, shaped by 50 years of clinical research and practice. *JAMA Cardiol.* 2016;1:98-105.
2. Cui H, Schaff HV, Dearani JA, Lahr BD, Viehman JK, Geske JB, et al. Does ablation of atrial fibrillation at the time of septal myectomy improve survival of patients with obstructive hypertrophic cardiomyopathy? *J Thorac Cardiovasc Surg.* 2021;161:997-1006.e3.
3. Ad N, Holmes SD, Roberts HG Jr, Rankin JS, Badhwar V. Surgical treatment for stand-alone atrial fibrillation in North America. *Ann Thorac Surg.* 2020;109:745-52.
4. Musharbash FN, Schill MR, Sinn LA, Schuessler RB, Maniar HS, Moon HR, et al. Performance of the Cox-maze IV procedure is associated with improved long-term survival in patients with atrial fibrillation undergoing cardiac surgery. *J Thorac Cardiovasc Surg.* 2018;155:159-70.
5. Rowin EJ, Hausvater A, Link MS, Abt P, Gionfriddo W, Wang W, et al. Clinical profile and consequences of atrial fibrillation in hypertrophic cardiomyopathy. *Circulation.* 2017;136:2420-36.
6. Damiano RJ Jr, MacGregor R. 30 years of surgical ablation for "stand-alone" atrial fibrillation: have we abandoned an evidence-driven approach? *Ann Thorac Surg.* 2020;109:627-9.
7. Murashita T, Rankin JS, Wei LM, Roberts HG, Alkhouli MA, Badhwar V. Oral anticoagulation may not be necessary for patients discharged in sinus rhythm after the Cox Maze IV procedure. *J Thorac Cardiovasc Surg.* 2018;155:997-1006.

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Commentary: Navigating the maze of ablation

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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.¹ 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 patients² 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.

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new-onset AF for those initially presenting in sinus rhythm.³ 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.