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Commentary: Off-pump ablation of atrial fibrillation—Can it work?

Leonid Sternik, MD

I wish to thank Harlaar and colleagues¹ for their important article in this issue of the *Journal*. They performed a study of thoracoscopic ablation of the atrial fibrillation (AF). In one group of patients, they used clamping devices; in another group, they applied nonclamping devices. Patients in this study had relatively small left atria and did not have a long history of long-standing persistent atrial fibrillation. At the end of first year, 91% of patients in the clamping group and 79% of patients in the nonclamping group were in sinus rhythm. All patients were treated with antiarrhythmic drugs at least 3 months after surgery, and 10% of patients in the clamping group and 21% in the nonclamping group underwent catheter ablation of AF after surgery. I think that the results were not so good, especially in the non-clamping group, considering the small left atria and lack of a long history of atrial fibrillation on the one hand and the aggressive treatment of postoperative AF with antiarrhythmic drugs for all patients for all at least for 3 months and 10% and 21% postoperative catheter ablation rates on the other hand.

I am sure that it is difficult to achieve transmural lesions with epicardial nonclamping devices. And transmural lesions are must for a successful ablation. We have enough evidence of that in the literature.²⁻⁴ Miyagi and associates⁵ stated that epicardial monopolar radiofrequency ablation does not produce a transmural lesion and a conduction block.

With a bipolar Gemini clamp (Medtronic, Dublin, Ireland), I am not sure that transmural lesions always can be achieved. We can face a thick atrial wall in some patients. Transmural lesions can be difficult to achieve in some cases, especially when we ablate the atrium off cardiopulmonary bypass with blood trying to pass through the left atrium. My group has suggested a method of ablation clamping only one atrial wall. We placed a jaw of a bipolar radiofrequency ablation device epicardially and the other jaw of the clamp

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CENTRAL MESSAGE

In off-pump atrial fibrillation ablation, it is difficult to achieve transmural lesions. Safe and effective ablation can be done on cardiopulmonary bypass with an arrested heart and open left atrium.

endocardially, performing ablation lines applying radiofrequency clamp on the open left atrium. This technique allows us to avoid clamping 2 atrial walls epicardially, as most surgeons do. This way we avoid an excessive tissue thickness in the clamp device.⁶

Surgical ablation of lone atrial fibrillation can be very safely and effectively performed on cardiopulmonary bypass with an arrested heart and open left atrium by using femoral cannulation, a small left thoracotomy, and a Chitwood or similar aortic clamp. It may allow better transmural lesions. I believe that morbidity and mortality of this procedure can be and should be almost zero. Harlaar and colleagues,¹ with their expertise in thoracoscopy, can probably perform thoracoscopic ablation of lone AF with cardiopulmonary bypass, cardioplegic arrest, and ablation of the open left atrium. I am sure that ablation will be more successful, with the same procedural risks.

I congratulate Harlaar and colleagues¹ on reporting this large series of surgical lone atrial fibrillation ablation. We have to work very closely with our electrophysiologists in a heart team way to have referral of these patients for whom catheter ablation is difficult. We are able to perform very safe and very effective surgical ablation these days.

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Commentary: Pursuit of the electrically isolated box

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The opportunity to surgically treat patients with long-standing persistent atrial fibrillation (AF) without a concomitant cardiac lesion is uncommon. Catheter-based ablation has been the preferred approach, but the results have not been good (<50% freedom from AF at 1 year). For surgical ablation to serve as an alternative to catheter ablation, several important elements must be met. Improved efficacy is paramount; however, the reproducibility of the procedure, ease of performing the procedure, and adaptability of the device delivering the energy source to minimally invasive approaches are critically important to success. Thorascopic techniques have been developed, and bipolar or unipolar radiofrequency (RF) energy delivery devices have been adapted to less invasive approaches. Techniques with a range of variations have been described. The best techniques, MAZE lesion pattern, and documented efficacy in long-standing persistent AF require larger studies.

In this issue of the *Journal*, Harlaar and colleagues¹ compare 2 different techniques and different energy delivery devices on the efficacy of restoring normal sinus rhythm (NSR). It is studied after a minimally invasive modified left-

Richard J. Shemin, MD

CENTRAL MESSAGE

Optimal results for the surgical MAZE procedure require reproducible low risk and an effective procedure. This study suggests that bipolar radiofrequency clamps provide the best results.

sided MAZE. Both approaches include bipolar radiofrequency ablation of the pulmonary veins in pairs. The roof and floor connection lines of ablation differ. These lesions were created by a RF clamp in one group and with a unipolar irrigated RF device in the other group. More important was the number of energy source applications (4 with the bipolar clamp vs up to 20 with the unipolar device, ie, no clamp). This has implications for operative times. As expected, the “heat sink” of circulating blood in the no clamp technique is an issue.

To the investigators’ credit, entrance and exit block mapping of both the pulmonary veins and the isolated posterior left atrial wall within the box was performed. Additional ablation was done if the isolation was incomplete. It should be noted that the potential for conduction recovery across a line of ablation is possible, due to stunning and recovery

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