Commentary: Surgical ablation for atrial fibrillation: Make it simple but not simpler (Albert Einstein)

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McCarthy and colleagues describe a modification to the cryothermic Cox maze procedure. The authors should be congratulated for their unusually high rate of surgical ablation (SA) and excellent reported outcomes. Of note, 80% of the patients underwent left atrial–only SA, not the modified Cox maze, probably due to early referral for mitral valve surgery. A few aspects of this paper merit further discussion.

First, given that this paper focused on technique, it is somewhat brief in detailing rhythm follow-up methods and outcome reporting, which creates difficulty in determining the safety and efficacy of this modification. It would be important to have a follow-up publication focused on the results of this approach.

Second, surgery for atrial fibrillation (AF) should be an integral part of any cardiac surgical intervention for patients with AF. Unfortunately, misconceptions regarding efficacy, safety, and importance of treating AF leave many patients untreated, with no recognition from referring cardiologists and the surgical community. This paper describes a quick way to perform SA to urge more surgeons to include the procedure. Increasing SA utilization and directing surgeons and referring cardiologists to better understand the pathophysiology of AF are huge challenges for all of us with no easy solutions in sight.

Third, the use of cryoablation is welcomed, as cryoablation is safe and effective when applied appropriately. Both surgical cryoablation platforms available for clinical use function on the basis of the Joule–Thomson principle. When applied, the operator does not know how stable and uniform the temperature is along the device-ablating surface. Also, there is no effective way to assess the ablated tissue temperature, leaving atrial tissue ice formation as the only feedback. In addition, the appropriate device-to-tissue contact along the freezing shaft is fully dependent on good visualization and experience. Because the reported approach is based on fewer cryoablation applications and longer ablated segments, I have concerns it may result in incomplete cryoablation lines, especially with less-experienced operators and more complex atrial substrate. My recommendations would be to consider proceeding more conservatively when applying cryoablation and follow the basic concepts of cryoablation:

1. Never freeze segments longer than 5 cm. This allows better control of the ablation quality. Use of shorter probe segments is associated with more uniform temperatures along the freezing segment, better control of tissue contact, and avoids collateral damage.
2. Always overlap cryolesions to avoid significant gaps and failure.
3. Keep in mind that extending procedure time by 10 to 15 minutes is not going to hurt patients, but AF recurrence may be detrimental.
4. Finally, one potentially confusing aspect to the manuscript needs clarification. The 2-minute freeze for nitric oxide

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CENTRAL MESSAGE
Surgical ablation for atrial fibrillation should be considered in all patients undergoing mitral valve surgery.
devices was established decades ago in Dr James Cox’s laboratory. Since then, this specific cryoablation machine console has been modified and the freezing algorithm was changed with the 2-minute count starting almost immediately when the probe temperature is around –40 °C. Historically, we would wait for the ice ball to form on the tissue (~45 to 60 seconds) before starting the 2-minute count. We changed the freezing protocol for the ICE-AFIB trial (NCT03732794) to 3 minutes in an attempt to comply with the original recommendations. Future research should focus on actual tissue temperature and the rate of tissue cooling to better guide ablation procedures.

References