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Commentary: Finding the way through the maze

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Persistent preoperative atrial fibrillation (AF) has been demonstrated to negatively influence the short- and long-term outcomes for patients undergoing cardiac surgery when left untreated.¹ Concomitant surgical treatment of AF is possible through surgical ablation. The maze technique was performed for the first time 34 years ago by Dr James Cox² and since then, a growing bulk of evidence has been building that demonstrates optimal long-term rates of sinus rhythm restoration and improved survival in patients undergoing concomitant ablation.³ Most of the evidence on the maze procedure comes from mitral valve surgery studies because the proportion of patients with AF is as high as 40% when degenerative mitral regurgitation is present.⁴ Conversely, the maze procedure combined with tricuspid valve surgery has rarely been under the spotlight.

Park and colleagues⁵ present the long-term outcomes of patients with persistent AF and severe tricuspid regurgitation undergoing the maze procedure. Using propensity score matching, the authors show a more favorable sinus rhythm restoration and a lower rate of major adverse cardiovascular events at 9 years in patients undergoing concomitant maze cryoablation. This report adds to the literature important findings for a specific subgroup of patients. Tricuspid regurgitation usually coexists with biatrial dilatation, which has been shown to be a potential indicator of sinus rhythm restoration failure.^{6,7} However, patients with left and right atrial diameter within a certain limit—60 and 54 mm in this study—could still benefit from AF ablation, thus preventing exposure to the potential adverse events from AF and the required anticoagulation.⁵ These

Arnaldo Dimagli, MD (left), and Vito Domenico Bruno, MD, PhD (right)

CENTRAL MESSAGE

Patients with severe tricuspid regurgitation may achieve acceptable rates of sinus rhythm restoration after surgical ablation of atrial fibrillation.

findings, although they must be confirmed in further studies, allow us to better define who are the patients who should undergo a maze procedure.

Another relevant concern when treating patients with severe tricuspid regurgitation is related to prolonging the cardiopulmonary bypass time due to surgical ablation. These patients could present with severe sequelae of the chronic valvopathy such as multiorgan failure, and therefore longer operative times could be detrimental. However, Park and colleagues⁵ demonstrate comparable cardiopulmonary bypass times: Just over 2.5 hours for both groups. This article adds to the existing evidence already proving the safety and effectiveness of the maze procedure. Indeed, anticipated longer operative times are often feared by surgeons for the potential association with worst postoperative outcomes and induce surgeons to omit concomitant ablation when it would actually be beneficial.

It is important to note that the article by Park and colleagues⁵ is based on a retrospective analysis of surgical cases. Despite that the authors adopted a sophisticated adjustment methodology based on propensity score matching, it is still possible that residual confounders could have biased the results. In fact, among the limitations of the calculation of propensity score is that it can be computed only on the observed, measured variables (eg, age, sex, and diabetes status), but it does not take into account those patient characteristics that are not measured (eg, fragility). These variables are usually assessed by the eyeball test—that is, surgeon's intuition—and together with the measured variables are weighted in decision-making process. For this

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reason, even a perfectly conducted propensity score matching could still be potentially undermined by selection bias.⁸

The results presented by Park and colleagues⁵ should stimulate wider adoption of concomitant surgical ablation procedures in patients undergoing tricuspid valve surgery for severe tricuspid regurgitation in view of the promising outcomes and rhythm restoration. Particular attention should be paid to optimal patient selection, in particular with regard to the presence of biatrial enlargement that could jeopardize the benefits associated with AF ablation.

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