EDITORIAL COMMENT

Combining Ablation of Atrial Fibrillation With Ablation of Atrial Flutter: Are We There Yet?*

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Atrial fibrillation (AF) and atrial flutter can coexist. Their association is of particular concern when considering curative ablation. Symptoms, similar for both, are disconcerting should either one occur after ablation. Complete cure is the goal. Right atrial (cavo-tricuspid isthmus) ablation can cure >90% of typical forms of flutter. Unfortunately, AF can occur after flutter ablation. In contrast, pulmonary vein isolation can cure AF; yet, flutter may emerge, requiring ablation directed at separate sites. These issues are important when planning ablation strategies for patients with both arrhythmias.

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THE STUDY

In this issue of the Journal, Scharf et al. (1) suggest that during AF ablation, lesion sets should be delivered not only to the left atrium but also to the right atrial isthmus in patients at risk for flutter, because without so doing, flutter will occur. This may not be a small problem, because in this report, the detection of atrial flutter occurred during the electrophysiology study or was detected clinically in most AF patients. Of 133 consecutive patients presenting for AF ablation, 40 had documented flutter and 86 had flutter that was initiated during the procedure (including 32 with documented flutter). Although not randomized, of the 28 who underwent isthmus ablation, none had flutter, whereas those who did not had risk for flutter. When ablating AF, Scharf et al. (1) conclude, it is appropriate to ablate typical forms of induced, or clinically detected, flutter. This provocative study raises several issues.

ARRHYTHMIA DOCUMENTATION

Even with attempts to document symptoms before and after ablation, the burden of AF and flutter may be underestimated. Atrial arrhythmias can be undetected, unrecorded, or misinterpreted. This is especially important because proper diagnosis is key to successful treatment. It is not clear how systematic investigations were to clinch the arrhythmia diagnosis, how many tracings were recorded, how diagnostic the tracings were, or how much data were available.

Clinical flutter is not induced flutter. Flutter induced in the electrophysiology laboratory has an unclear meaning in this population, and its presence may not be enough to mandate flutter ablation. Among those with post-procedure flutter not undergoing initial isthmus ablation, 72% (18 of 25) had inducible typical flutter, whereas of those without post-procedure flutter, 39% (39 of 80) had inducible flutter (1). Isthmus ablation was not necessary to remain flutter free.

Inconsistencies with other reports. Flutter may not be an important issue after AF ablation. High rates of complete success with AF ablation are possible even without isthmus ablation (2,3). Why do data differ from this single site? If flutter is so common, why have others not seen it?

The reason may consist in the approach used in AF ablation. Progress has been so rapid that even reports from the same center contain different approaches at nearly the same time. In a separate study, these same investigators report excellent results in a comparative trial of segmental pulmonary vein ablation versus left atrial ablation alone (4). In this entire study of AF ablation, only one patient had a left atrial flutter, and that was considered a complication of the ablation approach. Data are not consistent even from the same laboratory!

Wazni et al. (5) hypothesized that in patients with AF and typical flutter, AF ablation may eliminate both. In a comparative, randomized trial assessing pulmonary vein disconnection alone versus pulmonary vein disconnection with right atrial isthmus ablation, no significant long-term differences could be found. Isthmus ablation helped only to reduce early post-ablation flutter, although neither group had a high incidence of flutter. Wazni et al. (5) concluded that pulmonary vein disconnection alone is sufficient to control AF and flutter.

Early arrhythmia recurrence after ablation may not predict long-term ablation success. AF after flutter ablation can be transient (6) just as flutter after AF ablation may be (5). In the Scharf et al. (1) study, many recurrences were early. If no further therapy were delivered, perhaps flutter would have resolved.

COMBINING RIGHT AND LEFT ATRIAL ABLATION

Despite the success of flutter ablation, AF can occur in approximately 30% of patients (6,7), especially if there is a history of AF or atypical, non-isthmus-dependent flutter (8,9). On the basis of the nearly complete cure in 70% of patients, is it justified to perform left-sided ablations for all patients so that for the remaining 30%, AF will not occur? Of course not. Even then the procedure may not be effective and, for some, AF may only be transient (6,10).

Although right atrial ablation is less effective than left atrial ablation in treating AF, it is most successful when
flutter is the predominant rhythm and is well documented and when AF is intermittent and paroxysmal (6,7,9,11). Patients who have atrial fibrillation organized to flutter with a class IC antiarrhythmic drug may benefit from flutter ablation (12). However, flutter ablation frequently is not enough for those with both arrhythmias (6,13). One view is that that flutter ablation is palliative and only one aspect of long-term care (14).

Determining the best ablative approach remains a challenge. Some have even asked the question: “Should flutter ablation be discouraged in patients with documented AF?” (15). Alternatively, it is possible that flutter ablation alone may have sufficed for some of the Scharf et al. (1) patients. Also, as Scharf et al. (1) have observed, patients with AF could have a second procedure for flutter at another time. Scharf et al. (1) present no data that a second procedure causes undue risk. Of 28 patients in the Scharf et al. (1) study having “combined procedures,” some had more than one procedure within two weeks. It remains unclear how many did and, if so, why.

**PERFORMING FLUTTER ABLATION DURING AF ABLATION: NOT IDEAL**

The investigators used post-pacing intervals and minimal recordings to determine flutter mechanism and procedural success. Although potentially adequate, different catheters and sheaths may be required for successful flutter ablation, and some typical flutters do not follow expected post-pacing interval rules. There is a risk that attention will focus on an adequate AF ablation so that the flutter ablation may be underemphasized. Isthmus ablations add time, cost, and risk, and besides, they might not be needed.

**MECHANISTIC RELATIONSHIP BETWEEN FLUTTER AND AF**

There is a close but poorly understood relationship between flutter and AF (16). It is not yet clear whether flutter is triggered by pulmonary venous ectopic activity or other factors. In animal models and perhaps humans, AF initiates flutter (17) in conjunction with anatomic and functional barriers (18). Septal activation may be important (19). Flutter can precipitate AF in part because of the breakdown of boundaries. Ectopic activity from the left atrium can collide with flutter to create AF (20). Conduction properties, vagal influence, refractoriness, and myocardial damage may be responsible; these factors can coexist and interact. In canine experiments, the breakdown of functional conduction block in the crista terminalis can convert flutter to AF (21). Flutter and AF can exist simultaneously (22,23).

The mechanisms of flutter and AF are distinct, but the rhythms are intertwined, or so it seems, until one is ablated. If pulmonary veins trigger AF, they may also trigger flutter, but if triggers are eliminated even if the substrate is present, flutter might no longer be a problem. Conversely, if flutter were ablated, the breakdown to AF would be less unlikely. Atrial fibrillation begets AF (24). Is it unreasonable to suspect flutter begets AF and AF begets flutter (21)? Also, AF ablation can beget flutter (25).

**Conclusions.** A universal, low-cost, safe, and effective procedure for AF and flutter ablation may ultimately develop. Until then, we need to consider which patients need a flutter ablation and which patients need an AF ablation. It is beginning to seem that many patients have overlap conditions that require both. If so, is it best to ablate only one arrhythmia and wait to see whether the other occurs? Perhaps not for those whose arrhythmias are highly symptomatic, or risky, yet, despite the best available procedures, ablation cannot yet guarantee complete arrhythmia elimination. For patients undergoing ablation of AF without history of flutter but who have inducible flutter at electrophysiology testing, the data are not yet strong enough to recommend a combined flutter and AF ablation. I congratulate Scharf et al. (1) in exploring this controversial area and admire their courage in exploring new paths.

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**REFERENCES**


