



Anticoagulation after Atrial Fibrillation Ablation: Many Blanks to Fill

Martin Fiala, MD, PhD

Department of Cardiology, Heart Centre, Hospital Podlesí a.s., Třinec, Czech Republic.

Abstract

Long-term maintenance of sinus rhythm (SR) after catheter ablation of atrial fibrillation (AF) has remained an open issue awaiting further relevant data. It is of paramount importance as our everyday decisions on discontinuing anticoagulation after ablation rest on the belief in the absence of clinically significant asymptomatic AF episodes and constant SR for the rest of the patient's life. Both aspects are difficult to ascertain, for the tools of truly continuous ECG monitoring are not comfortably applicable, and routine follow-up tends to thin out beyond 1 year in asymptomatic patients without apparent arrhythmia recurrences.

Introduction

Long-term maintenance of sinus rhythm (SR) after catheter ablation of atrial fibrillation (AF) has remained an open issue awaiting further relevant data. It is of paramount importance as our everyday decisions on discontinuing anticoagulation after ablation rest on the belief in the absence of clinically significant asymptomatic AF episodes and constant SR for the rest of the patient's life. Both aspects are difficult to ascertain, for the tools of truly continuous ECG monitoring are not comfortably applicable, and routine follow-up tends to thin out beyond 1 year in asymptomatic patients without apparent arrhythmia recurrences. Entailing unawareness silently splits the feelings and opinions of ablationists and the rest of the cardiology public. Ablationists (who may incline to overrate the results of their work) have provided some encouraging data on the very low incidence of thromboembolic events after successful ablation despite warfarin withdrawal.¹⁻³ These stud-

ies have uniformly shown normalization of the incidence of ischemic stroke to less than 1% per year. On the other hand, general cardiology public (who rather tend to mistrust AF ablation) may be slipping into over-anticoagulation. Lack of prospective, randomized, multicenter data proving safety of anticoagulation cessation after successful AF ablation naturally project onto the guidelines that may seem overcautious to the ablationists.⁴

In the paper on long-term outcome after successful ablation of AF recently published by Tzou et al. in the *Circulation Arrhythmia & Electrophysiology* journal, an important message has been conveyed: continued vigilance for recurrent AF is warranted beyond one year of uneventful clinical course.⁵ In this study, of the selected patients with successful outcome of a single ablation at 1 year, only 85% remained in stable SR after 3 years, and even only 71% after 5 years, showing approximately 7% per year late AF recurrence. This does not inevitably mean that anticoagulation should be maintained

Corresponding Address : Martin Fiala, MD, PhD, Department of Cardiology, Heart Center, Hospital Podlesí a.s., Kinská 453, Třinec, 739 61, Czech Republic.

indiscriminately in all the patients because of doubts about the ablation efficacy. It rather accentuates the need for watchful postablation follow-up focused on timely detection of unexpected recurrences. Indeed, a majority of the patients having undergone repeat ablation remained free of AF without drugs for the additional 3 years.⁵

The study further noted reconnection of the arrhythmogenic PVs in nearly all the patients undergoing repeat ablation, and PV reconnection led to freedom from AF in 11 of 15 patients. Why does reconnected PV activity resume arrhythmogenic functioning with such a long deferral? The cause is not clear. However, if we follow these patients thoroughly, we will hardly miss some complaints of rhythm disturbance, and relatively frequent atrial premature beats in their early postablation stage. Therefore, it is probable that these patients display arrhythmogenic PV recovery-reconnection early after ablation, but concurrent fresh modification of the substrate forestalls recurrences of sustained AF until further gradual substrate deterioration again exceeds a certain limit. These patients with known frequent isolated atrial ectopy early after ablation should definitely be periodically monitored for AF recurrences and re-ablated betimes.

Tzou et al. also proved that the late AF recurrence was predicted by the presence of persistent AF at baseline. Such finding is not unexpected provided pulmonary vein (PV) isolation and possibly non-PV triggers had been the mere ablation targets. Arrhythmogenic substrate and sources of persistent AF are obviously more complex and may require more extensive ablation strategy.⁶⁻⁸ The same applies to the older patients who are more amenable to atrial structural remodeling for different reasons. It is possible that stratifying patients according to the atrial structural characteristic and substrate complexity to more extensive step-up approaches will change our perception of age or AF persistency as the determinants of more frequent ablation failure. Indeed, some studies of persistent or longstanding persistent AF show (at the expense of repeat ablation in more than 50% of the patients) longer-term outcome comparable to that of paroxysmal AF.^{6,9}

To reach more fearless consensus on the anticoagulation therapy after ablation that would adequately reflect the real risk (as many ablationists

may perceive), we need more conclusive data. Until now, scores containing multiple clinical variables serve as a surrogate of more important individual procoagulation status that we cannot identify by current methods, prevail. Much less we appreciate that under the condition of SR, these clinical variables lose predicting power, as if we accepted in advance earlier or later ablation failure. Should we anticoagulate the whole population from the age of 55 years, because we do not believe in their apparent SR? In fact, AF ablation opens up a unique opportunity for the patients and physicians to continue adequate comfortable long-term follow-up based on periodic tele-monitoring, quality of life assessment, coagulation status testing, etc. under the umbrella of centers for AF management. Under surveillance of specialists, patients could be sorted out to more individualized anticoagulation, and timely indicated to repeat ablation. Indeed, in the studies ascertaining thromboembolic events after ablation, first thing we have to recognize is that 20-30% of the patients were considered to remain in higher thromboembolic risk and were left on warfarin permanently despite SR.¹⁻³ This, in a way, corroborates fairly judicious approach to anticoagulation in patients having undergone ablation.

Decision to withdraw anticoagulation is easier after ablation of paroxysmal AF limited to PVs, let alone in otherwise healthy patient with small left atrium. One of the forthcoming issues is; however, how to deal with patients, who successfully undergo complex ablation for persistent AF. Current guidelines favor lifelong anticoagulation.⁴ Extensive ablation including additional linear or cluster ablation naturally arouses misgivings about the residual left atrial transport function and heads us to disinclination to warfarin cessation.⁴ But let us take the liberty of introducing an example of a patient 55 years old, who experienced minor stroke 2 year before ablation, when his longstanding persistent AF was first diagnosed. His AF was terminated via 2 different atrial tachycardias into SR by ablation, rendered noninducible, and SR has now been maintained for years. His baseline left ventricular ejection fraction of 35% improved to normal, and, more importantly, his preablation peak (maximum possible) left atrial appendage outflow velocity of 25 cm/s increased to 65 cm/s during SR. In addition, appendage is activated early, with a long interval to QRS complex, thus

ensuring timely emptying before the mitral valve closure. The patient is now healthy and off all drugs. Should we have kept him on anticoagulation lifelong? From the limited data we know, left atrial function can be preserved after extensive catheter ablation.¹⁰ Appendage, the risky structure for thromboembolism under the mechanical dysfunction during AF, may revert to normal function under SR. Appendage is likely to determine majority of the whole left atrial transport function, and its mechanical recovery may impact on thromboembolism as well as hemodynamics. Its activation timing and emptying function can be respected even by more extensive ablation strategies (if scarce foci are not just located here). As measurable variables, appendage timing and outflow velocity may serve as additional clues for safer decisions in our efforts to let our patients to have the convenience of warfarin (or any other future anticoagulation) cessation.

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