Hellenic Journal of Cardiology (2016) 57, 338–339

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://www.journals.elsevier.com/hellenic-journal-of-cardiology/

EDITORIAL

Periprocedural anticoagulation in patients undergoing cryoballoon ablation for atrial fibrillation

Ablation strategies evolved significantly in atrial fibrillation (AF) management during the past 20 years.[1] Radiofrequency pulmonary vein isolation (PVI) is the cornerstone of our AF ablation regimen. Cryoballoon ablation for AF has emerged as an alternative to radiofrequency PVI for treating drug-resistant AF. Although cryoballoon PVI, compared with radiofrequency PVI, offers many potential advantages,[2–4] it shares the same periprocedural thromboembolic and bleeding risks.[5–7] Periprocedural anticoagulation management using uninterrupted warfarin and a "therapeutic" international normalized ratio (INR) is the best approach for reducing both thromboembolic and bleeding complications, especially in patients with non-paroxysmal AF.[8,9] Recently, novel oral anticoagulants (NOACs) have been introduced for the prevention of thromboembolic complications in patients with AF.[10–13] NOACs such as dabigatran, apixaban, rivaroxaban, and edoxaban provide a demonstrated non-inferiority to warfarin for stroke prevention in patients with AF.[13–16] Although nonrandomized studies have evaluated the safety and feasibility of dabigatran, rivaroxaban and apixaban in the setting of radiofrequency AF ablation,[14–17] sparse data have been presented regarding the efficacy and safety of NOACs following cryoballoon ablation for AF.

In this context, the study by Baltogiannis et al.[18] presents an interesting evaluation of periprocedural complications in patients undergoing cryoballoon ablation for AF using different anticoagulation strategies. In the current study, NOACs proved to be as effective as uninterrupted warfarin in terms of bleeding complications and thromboembolic events. The patients receiving aspirin had more hemorrhagic complications than both the warfarin and NOACs groups. Similar anticoagulation strategies in the peri-interventional setting of patients undergoing cryoballoon ablation for AF without major complication rates have been reported recently.[19,20] Comparative evaluation of hemorrhagic and ischemic complications among NOACs and warfarin in patients undergoing cryoballoon ablation for AF was attempted in one of those two studies.[20] NOACs were associated with fewer major bleeding or cerebral ischemic events compared to warfarin.[20] However, in all three studies,[18–20] low-risk populations with paroxysmal AF were mainly encountered. It is well known that thromboembolic phenomena occur mainly in the patients with non-paroxysmal AF who undergo catheter ablation for AF.[9] The results of the study by Baltogiannis et al.[18] may strengthen the value of NOACs in the periprocedural management of low-risk patients who often present for cryoballoon ablation for AF without adequate anticoagulation. The rapid onset of action of NOACs without the need for bridging makes them particularly attractive for both uncomplicated and complicated AF ablations. NOACS may be encountered as a "do no harm" alternative regimen in our AF therapeutic armamentarium.[21]

Conflict of interest

The authors have no potential conflicts of interest to declare.

Funding

None.

References

1. Kallergis EM. Ablation of atrial fibrillation: twenty years' experience. *Hell J Cardiol*. 2014 Jul–Aug;55(4):269–271.
2. Siddoway D, Friehling M, Voigt A, Saba S, Jain S. Improved resource utilization with similar efficacy during early adoption of cryoballoon pulmonary vein isolation as compared with

Peer review under responsibility of Hellenic Cardiological Society.

http://dx.doi.org/10.1016/j.hjc.2017.01.014

radiofrequency ablation for paroxysmal atrial fibrillation. *J Atr Fibrillation*. 2015;7(5):15—19.
3. Neumann T, Vogt J, Schumacher B, et al. Circumferential pulmonary vein isolation with the cryoballoon technique. *J Am Coll Cardiol*. 2008;52:273—278.
4. Packer DL, Kowal RC, Wheelan KR, et al. ''Cryoballoon'' ablation of pulmonary veins for paroxysmal atrial fibrillation: first results of the North American Arctic Front (STOP AF) Pivotal trial. *J Am Coll Cardiol*. 2012;16:1713—1723.
5. Cappato R, Calkins H, Chen SA, et al. Prevalence and causes of fatal outcome in catheter ablation of atrial fibrillation. *J Am Coll Cardiol*. 2009;53:1798—1803.
6. Viles-Gonzalez JF, Mehta D. Thromboembolic risk and anticoagulation strategies in patients undergoing catheter ablation for atrial fibrillation. *Curr Cardiol Rep*. 2011;13:38—42.
7. Kuck KH, Brugada J, Fürnkranz A, et al, Fire and Ice Investigators. Cryoballoon or radiofrequency ablation for paroxysmal atrial fibrillation. *N Engl J Med*. 2016 Jun 9;374(23):2235—2245.
8. Di Biase L, Burkhardt JD, Mohanty P, et al. Periprocedural stroke and management of major bleeding complications in patients undergoing catheter ablation of atrial fibrillation: the impact of periprocedural therapeutic international normalized ratio. *Circulation*. 2010;121:2550—2556.
9. Di Biase L, Burkhardt JD, Santangeli P, et al. Periprocedural stroke and bleeding complications in patients undergoing catheter ablation of atrial fibrillation with different anticoagulation management: results from the role of Coumadin In Preventing Thromboembolism in Atrial Fibrillation (AF) Patients Undergoing Catheter Ablation (COMPARE) randomized trial. *Circulation*. 2014;129:2638—2644.
10. Connolly SJ, Ezekowitz MD, Yusuf S, et al, RE-LY Steering Committee and Investigators. Dabigatran versus warfarin in patients with atrial fibrillation. *N Engl J Med*. 2009;361:1139—1151.
11. Patel MR, Mahaffey KW, Garg J, et al, ROCKET AF Investigators. Rivaroxaban versus warfarin in nonvalvular atrial fibrillation. *N Engl J Med*. 2011;365:883—891.
12. Granger CB, Alexander JH, McMurray JJ, et al, ARISTOTLE Committees and Investigators. Apixaban versus warfarin in patients with atrial fibrillation. *N Engl J Med*. 2011;365:981—992.
13. Giugliano RP, Ruff CT, Braunwald E, et al, ENGAGE AF-TIMI 48 Investigators. Edoxaban versus warfarin in patients with atrial fibrillation. *N Engl J Med*. 2013;369:2093—2104.
14. Kaseno K, Naito S, Nakamura K, et al. Efficacy and safety of periprocedural dabigatran in patients undergoing catheter ablation of atrial fibrillation. *Circ J*. 2012;76:2337—2342.
15. Lakkireddy D, Reddy YM, Biase LD, et al. Feasibility and safety of uninterrupted rivaroxaban for periprocedural anticoagulation in patients undergoing radiofrequency ablation for atrial fibrillation. *J Am Coll Cardiol*. 2014;63:982—988.
16. Nagao T, Inden Y, Shimano M, et al. Efficacy and safety of apixaban in the patients undergoing the ablation of atrial fibrillation. *PACE*. 2015;38:155—163.
17. Di Biase L, Lakkireddy D, Trivedi C, et al. Feasibility and safety of uninterrupted periprocedural apixaban administration in patients undergoing radiofrequency catheter ablation for atrial fibrillation: Results from a multicenter study. *Heart Rhythm*. 2015;12:1162—1168.
18. Baltogiannis G, Chierchia G-B, Conte G, et al. The role of novel oral anticoagulants in patients undergoing cryoballoon ablation for atrial fibrillation. *Hellenic J Cardiol*. 2016;57(5):331—337. http://dx.doi.org/10.1016/j.hjc.2016.11.003.
19. Guhl EN, Siddoway D, Adelstein E, et al. Incidence and predictors of complications during cryoballoon pulmonary vein isolation for atrial fibrillation. *J Am Heart Assoc*. 2016 Jul 21;5(7). pii: e003724.
20. Okishige K, Nakamura T, Aoyagi H, et al. Comparative study of hemorrhagic and ischemic complications among anticoagulants in patients undergoing cryoballoon ablation for atrial fibrillation. *J Cardiol*. 2016 May 6;16:30058-2. pii: S0914-5087.
21. Kallikazaros IE. Atrial fibrillation: building walls and breaking down bridges. *Hell J Cardiol*. 2014 Sep-Oct;55(5):433—435.

Polychronis Dilaveris*
Dimitris Tousoulis
From the 1st Department of Cardiology, University of Athens Medical School, Hippokration Hospital, Athens, Greece

*Corresponding author. Polychronis Dilaveris, MD, PhD, FESC, 22 Miltiadou Street, 155 61 Holargos, Athens, Greece. Tel./Fax: +30-210-6531 377.
E-mail address: hrodil1@yahoo.com (P. Dilaveris)

16 November 2016
Available online 8 March 2017