

# Catheter ablation of atrial fibrillation in Poland: promising results of a national survey

Riccardo Cappato, Hussam Ali

Arrhythmia and Electrophysiology Center, IRCCS – MultiMedica Group, Milan, Italy

**RELATED ARTICLE**  
by Wojdyła-Hordyńska  
et al, see p. 974

Catheter ablation (CA) is a valuable therapeutic option in patients with symptomatic atrial fibrillation (AF) and there is a growing body of evidence regarding its safety, efficacy, and superiority to pharmacological therapy in maintaining sinus rhythm and improving quality of life.<sup>1</sup> Although technologies and designs of CA of AF have been evolving over the last decades, pulmonary vein isolation (PVI) remains the cornerstone of any ablative strategy and is recommended by the current international guidelines.<sup>2</sup> Nowadays, cryoballoon ablation (CBA) is spreading worldwide as a single-shot technology to achieve PVI and it was found to be noninferior to the conventional point-by-point radiofrequency ablation, and probably it is associated with shorter ablation procedures and a faster learning-curve.<sup>3,4</sup> Although evidence-based data in scientific research are mainly derived from prospective randomized clinical trials, surveys and registries are still relevant datasets to fill many gaps in knowledge by picturing clinical practice on a large scale and in a real-world setting.

In a recently published article in *Kardiologia Polska* (*Kardiol Pol*, *Polish Heart Journal*), Wojdyła-Hordyńska et al<sup>5</sup> conducted a national survey on AF ablation throughout Poland in 2018. The survey was based on a custom-built questionnaire (36 points), and data were collected from 38 representative Polish electrophysiology centers performing 3745 CA procedures in AF in that year. Paroxysmal AF was the most common form of arrhythmia in patients undergoing CA accounting for 65% of procedures. Cryoballoon ablation was the most utilized technology (almost 70% of participating centers), particularly in low-volume centers (80%) and in patients receiving their first ablation. The reported complication

rate was 6.4%, mostly related to local (vascular access) problems with a higher incidence in low-volume centers. Remarkably, longer CBA applications were associated with a significant increase in diaphragmatic palsy and atrial flutters following AF ablation.

This is a relevant survey providing a contemporary photograph of CA of AF in Poland regarding patients' selection, ablation strategies, and complication rate. The authors should be congratulated for their initiative to collect these data from a large number of Polish centers which requires substantial efforts and coordination capacity. Importantly, the survey achieved a high compliance rate exceeding 75% among the questioned centers. Moreover, the participating centers represented 55% of centers performing CAs of AF, which is a parallel proportion of all CAs of AF in Poland in 2018 highlighting the value of this survey. Atrial fibrillation was refractory at least for 1 antiarrhythmic drug in all patients undergoing CA, while paroxysmal AF presented the most common form (65% of procedures) reflecting high adherence to the current guidelines in patients' selection.<sup>2</sup>

However, a few considerations should be taken into account when reviewing and analyzing the collected data in this national survey. Although being beyond the aim of the survey, lack of results regarding the efficacy of CA, with and without antiarrhythmic drugs, and the incidence of AF recurrence following ablation, constitutes a gap that should be filled through future national studies and registries.

The complication rate was relatively low and comparable to other surveys and registries.<sup>6-8</sup> However, about two-thirds of the analyzed procedures were performed for paroxysmal AF, while two-thirds of patients had normal or

**Correspondence to:**  
Riccardo Cappato, MD,  
Arrhythmia and Electrophysiology  
Center, IRCCS – MultiMedica  
Group, via Milanese 300, 20099  
Sesto San Giovanni, Milan, Italy,  
phone: +39 02 82244005, email:  
riccardo.cappato@humanitas.it  
Received: July 30, 2020.  
Accepted: July 31, 2020.  
Published online: October 23, 2020.  
*Kardiol Pol*. 2020; 78 (10): 954-955  
doi:10.33963/KP.15610  
Copyright by the Author(s), 2020

mildly dilated left atrium ( $\leq 45$  mm), and only 5% of treated patients were affected by morbid obesity (BMI  $> 35$  kg/m<sup>2</sup>), probably reflecting a less “sick” population and more selective indications for AF ablation. Other clinical features such as the presence of significant structural heart disease (eg, heart failure), renal dysfunction, CHADS<sub>2</sub> or CHA<sub>2</sub>DS<sub>2</sub>-VASc score would better characterize the treated patients and their comorbidities.

Notably, the rate of major complications, including cardiac tamponade, permanent diaphragm paralysis, and neurologic events did not differ between low- and high-volume centers. Conversely, Deshmukh et al<sup>8</sup> analyzed the data of 93 801 CAs of AF performed in the United States between 2000 and 2010, using validated “International Classification of Diseases”, and they revealed a determinant role of both the center and operator experience in the overall frequency of complications (approximately 6.3%). These conflicting results may be due to differences in methodology regarding data collection and analysis, patients characteristics, the cutoff definition of a center experience (50 in the study by Deshmukh vs 100 ablations per year in the Polish survey), the prevalence of CBA technology in the Polish survey requiring a shorter learning curve while information about the operator experience was lacking. However, the frequency of local vascular complications in this survey was markedly higher in low-volume centers as compared with high-volume ones (9.5% vs 3.5%, respectively). The latter observation might also be related to the more frequent use of CBA requiring larger femoral sheaths, and the tendency to access a single femoral vein in the low-volume centers.

Death is a rare but a well-known potential complication of AF ablation, and related mortality rates have been reported between 0.15% to 0.46% in previous studies.<sup>6-9</sup> The absence of any reported death in 3745 CAs of AF included in this survey is encouraging but might be due to different patient populations, although under-reporting of such catastrophic complications cannot be excluded considering the survey methodology.

In this survey, longer CBA applications (ie, 480 seconds) were associated with increased occurrence of permanent diaphragmatic palsy (up to 2%) consistent with the results of the randomized 123-Study where shorter CBA applications reduced the acute phrenic nerve injury at the cost of PVI efficacy only for the left pulmonary veins, suggesting a tailored approach to apply shorter CBA applications for the right pulmonary veins.<sup>10</sup> Interestingly, longer CBA applications were also associated with increased frequency of atrial flutters following ablation. However, this coincidence cannot be definitively linked to the ablation technique or design since

much information is lacking, and many of these arrhythmias may be right-sided or typical atrial flutter, as reported by Baman et al<sup>11</sup> in their prospective CBA registry.

Finally, the survey by Wojdyła-Hordyńska et al<sup>5</sup> provides important data of the current state of CAs of AF in Poland regarding methods and complication rate, promoting further national research to analyze the safety and efficacy of the procedure.

## ARTICLE INFORMATION

**DISCLAIMER** The opinions expressed by the author are not necessarily those of the journal editors, Polish Cardiac Society, or publisher.

**CONFLICT OF INTEREST** RC reports the conflict of interest with the following companies: Boston Scientific, Bayer, Medtronic, Abbott, Pfizer, Daiichi Sankyo, Boehringer Ingelheim. HA declares no conflict of interest.

**OPEN ACCESS** This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (CC BY-NC-ND 4.0), allowing third parties to download articles and share them with others, provided the original work is properly cited, not changed in any way, distributed under the same license, and used for non-commercial purposes only. For commercial use, please contact the journal office at [kardiologiapolska@ptkardio.pl](mailto:kardiologiapolska@ptkardio.pl).

**HOW TO CITE** Cappato R, Ali H. Catheter ablation of atrial fibrillation in Poland: promising results of a national survey. *Kardiol Pol.* 2020; 78: 954-955. doi:10.33963/KP.15610

## REFERENCES

- 1 Calkins H, Reynolds MR, Spector P, et al. Treatment of atrial fibrillation with antiarrhythmic drugs or radiofrequency ablation: two systematic literature reviews and meta-analyses. *Circ Arrhythm Electrophysiol.* 2009; 2: 349-361.
- 2 Calkins H, Hindricks G, Cappato R, et al. 2017 HRS/EHRA/ECAS/APHS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation. *Europace.* 2018; 20: e1-e160.
- 3 Kuck KH, Fünkrantz A, Chun KR, et al. Cryoballoon or radiofrequency ablation for symptomatic paroxysmal atrial fibrillation: reintervention, rehospitalization, and quality-of-life outcomes in the FIRE AND ICE trial. *Eur Heart J.* 2016; 37: 2858-2865.
- 4 Akkaya E, Berkowitsch A, Zaltsberg S, et al. Ice or fire? Comparison of second-generation cryoballoon ablation and radiofrequency ablation in patients with symptomatic persistent atrial fibrillation and an enlarged left atrium. *J Cardiovasc Electrophysiol.* 2018; 29: 375-384.
- 5 Wojdyła-Hordyńska A, Baran J, Mazurek M, Derejko P. Results of a survey concerning atrial fibrillation ablation strategies in Poland. *Kardiol Pol.* 78: 974-981.
- 6 Cappato R, Calkins H, Chen SA, et al. Worldwide survey on the methods, efficacy, and safety of catheter ablation for human atrial fibrillation. *Circulation.* 2005; 111: 1100-1105.
- 7 Cappato R, Calkins H, Chen SA, et al. Update worldwide survey on the methods, efficacy and safety of catheter ablation for human atrial fibrillation. *Circ Arrhythm Electrophysiol.* 2010; 3: 32-38.
- 8 Deshmukh A, Patel NJ, Pant S, et al. In-Hospital complications associated with catheter ablation of atrial fibrillation in the united states between 2000 and 2010. *Circulation.* 2013; 128: 2104-2112.
- 9 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.
- 10 Molenaar MMD, Timmermans CC, Hesselink T, et al. Shorter cryoballoon applications times do effect efficacy but result in less phrenic nerve injury: results of the randomized 123 study. *Pacing Clin Electrophysiol.* 2019; 42: 508-514.
- 11 Baman JR, Kaplan RM, Diaz CL, et al. Characterization of atrial flutter after pulmonary vein isolation by cryoballoon ablation. *J Interv Card Electrophysiol.* 2020; 57: 233-240.