

## Editorial



# Cryoballoon Ablation in Korea: Is It Time to Freeze the Veins?

**Hyung-Seob Park , MD**

Division of Cardiology, Department of Internal Medicine, Cardiovascular Center, Keimyung University Dongsan Hospital, Keimyung University College of Medicine, Daegu, Korea

## OPEN ACCESS

**Received:** Sep 2, 2022

**Accepted:** Sep 7, 2022

**Published online:** Sep 26, 2022

### Correspondence to

**Hyung-Seob Park, MD**


Division of Cardiology, Department of Internal Medicine, Cardiovascular Center, Keimyung University Dongsan Hospital, Keimyung University College of Medicine, 1035, Dalgubeol-daero, Dalseo-gu, Daegu 42601, Korea.

Email: drparkgyver@gmail.com

Copyright © 2022. The Korean Society of Cardiology

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ORCID iDs

Hyung-Seob Park 

<https://orcid.org/0000-0002-8042-1029>

### Funding

The author received no financial support for the research, authorship, and/or publication of this article.

### Conflict of Interest

The author has no financial conflicts of interest.

► See the article “Cryoballoon Catheter Ablation in Korean Patients With Paroxysmal and Persistent Atrial Fibrillation: One Year Outcome From the Cryo Global Registry” in volume 52 on page 755.

Pulmonary veins are the most frequent trigger of atrial fibrillation (AF), and pulmonary vein isolation (PVI) is the cornerstone strategy of AF ablation. A PVI under the guidance of a 3D anatomical mapping system is effective and safe if performed by experienced operators in high-volume centers. However, there is a considerable learning curve to acquire the skills.<sup>1</sup> The cryoballoon ablation (CBA) system employs a single energy application for encircling lesions at the antral level of the pulmonary veins instead of point-by-point multiple energy applications during the conventional radiofrequency catheter ablation (RFCA).<sup>2</sup> CBA is reported to be less dependent on the operator's skill and more reproducible than RFCA in the setting of the PVI.<sup>3</sup> The randomized FIRE AND ICE trial demonstrated the non-inferiority of CBA as compared to RFCA regarding the efficacy and safety of treating patients with drug-refractory paroxysmal AF.<sup>4</sup> Moreover, several recent trials have shown the efficacy of CBA as the first-line therapy for AF as compared to antiarrhythmic drugs.<sup>5</sup>

The Cryo AF Global registry<sup>6</sup> is a prospective, multicenter, observational post market registry designed to assess the outcomes of AF ablation using CBA catheters (Arctic Front Advance Family; Medtronic, Inc., Minneapolis, MN, USA). The data were collected from procedures performed by 239 operators at 93 sites across 36 countries in Africa, Europe, Asia, North America, and South America. It was the first and largest assessment of a global patient population who underwent cryoballoon AF ablation. The results showed that the freedom from AF/atrial flutter (AFL)/atrial tachycardia (AT) after a 90-day blanking period was 86.4% in patients with paroxysmal AF and 70.9% in patients with persistent AF.

In this issue, Lim et al.<sup>7</sup> conducted a sub-analysis of the Cryo AF Global Registry. The aim was to determine the patient characteristics, procedural characteristics, and outcomes of CBA in the Korean sub-population within the Cryo Global Registry. The analysis included data from 299 patients from three hospitals in Korea. The patient characteristics of the Korean data had a slightly higher proportion of males (75.3%) and larger left atrial dimension (43±7 mm) than the global population. The procedural characteristics exhibited a relatively short procedure duration (76±21 minutes) as compared to the global cohort (82±34 minutes). The freedom from AF recurrence at 12 months was 83.9% in the paroxysmal and 61.6% in the persistent AF patients. The freedom from AF/AFL/AT recurrence was 75.2% and 56.7% in the patients with paroxysmal and persistent AF, respectively. Although the freedom from atrial arrhythmias

### Data Sharing Statement

The data generated in this study are available from the corresponding author upon reasonable request.

The contents of the report are the author's own views and do not necessarily reflect the views of the *Korean Circulation Journal*.

was lower than that of the other data from the same registry, rhythm monitoring was more extensively performed in Korean patients as the authors mentioned. All Korean patients received an electrocardiogram (ECG) during the follow-up. Holter monitoring was used at least once in 61.2% of the patients, and a continuous monitoring device was used to monitor 8.7% of the patients. However, only 79.9% underwent arrhythmia monitoring at least once during a 12-month follow-up in the full Cryo AF Global Registry cohort. Among the European results from the same registry cohort,<sup>8)</sup> 78.9% of the patients underwent atrial rhythm monitoring. The sub-analysis of the Japanese population,<sup>9)</sup> which only included paroxysmal AF patients, reported that the patients were monitored for an arrhythmia recurrence by a 12-lead ECG in 86.1% of the patients and Holter monitoring or more continuous monitoring in 51.5% of the patients. Those results show the pattern of the follow-up monitoring for different regions of the world after the AF ablation procedure in real clinical practice.

It has only been 4 years since CBA began to be performed in Korea. The results of the current issue may reflect the initial treatment experience with CBA in Korea. The proportion of a non-PV trigger ablation other than a cavotricuspid isthmus ablation was only 2.7% in the current registry. Recently, a randomized study demonstrated better clinical outcomes were achieved by an additional posterior wall isolation with CBA in Korean patients with persistent AF.<sup>10)</sup> Further experience with CBA in Korea may improve the clinical outcomes in patients with AF.

## ACKNOWLEDGMENTS

I thank Mr. John Martin for his linguistic assistance.

## REFERENCES

1. Calkins H, Hindricks G, Cappato R, et al. 2017 HRS/EHRA/ECAS/APHRS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation. *Heart Rhythm* 2017;14:e275-444.  
[PUBMED](#) | [CROSSREF](#)
2. Jin ES, Wang PJ. Cryoballoon ablation for atrial fibrillation: a comprehensive review and practice guide. *Korean Circ J* 2018;48:114-23.  
[PUBMED](#) | [CROSSREF](#)
3. Providencia R, Defaye P, Lambiase PD, et al. Results from a multicentre comparison of cryoballoon vs. radiofrequency ablation for paroxysmal atrial fibrillation: is cryoablation more reproducible? *Europace* 2017;19:48-57.  
[PUBMED](#) | [CROSSREF](#)
4. Kuck KH, Brugada J, Fürnkranz A, et al. Cryoballoon or radiofrequency ablation for paroxysmal atrial fibrillation. *N Engl J Med* 2016;374:2235-45.  
[PUBMED](#) | [CROSSREF](#)
5. Kim D, Yang PS, Joung B. Optimal rhythm control strategy in patients with atrial fibrillation. *Korean Circ J* 2022;52:496-512.  
[PUBMED](#) | [CROSSREF](#)
6. Chun KR, Okumura K, Scuzzo F, et al. Safety and efficacy of cryoballoon ablation for the treatment of paroxysmal and persistent AF in a real-world global setting: Results from the Cryo AF Global Registry. *J Arrhythm* 2021;37:356-67.  
[PUBMED](#) | [CROSSREF](#)
7. Lim HE, Oh IY, Kueffer FJ, van Bragt KA, On YK. Cryoballoon catheter ablation in Korean patients with paroxysmal and persistent atrial fibrillation: one year outcome from the Cryo Global Registry. *Korean Circ J* 2022;52:755-67.  
[PUBMED](#) | [CROSSREF](#)

8. Földesi C, Misiková S, Ptaszynski P, et al. Safety of cryoballoon ablation for the treatment of atrial fibrillation: First European results from the cryo AF Global Registry. *Pacing Clin Electrophysiol* 2021;44:883-94.  
[PUBMED](#) | [CROSSREF](#)
9. Kimura M, Kobori A, Nitta J, et al. Cryoballoon ablation for paroxysmal atrial fibrillation in Japan: 2-year safety and efficacy results from the Cryo AF Global Registry. *J Interv Card Electrophysiol* 2022;64:695-703.  
[PUBMED](#) | [CROSSREF](#)
10. Ahn J, Shin DG, Han SJ, Lim HE. Does isolation of the left atrial posterior wall using cryoballoon ablation improve clinical outcomes in patients with persistent atrial fibrillation? A prospective randomized controlled trial. *Europace* 2022;24:1093-101.  
[PUBMED](#) | [CROSSREF](#)