

Persistence of an iatrogenic atrial septal defect after a second-generation cryoballoon ablation of atrial fibrillation

Tomonori Watanabe, Shinsuke Miyazaki, Takatsugu Kajiyama, Sadamitsu Ichijo, Takamitsu Takagi, Miyako Igarashi, Hiroaki Nakamura, Hiroshi Taniguchi, Hitoshi Hachiya, Yoshito Iesaka

Watanabe et al. *Heart Vessels*. 2018 Mar;17.

INTRODUCTION

- ▶ Iatrogenic atrial septal defects (iASDs) following left heart catheterization procedures typically close within 3 months of a radiofrequency (RF) ablation^{1,2}, but have a greater persistence in patients undergoing first-generation cryoballoon (CB) ablations³ (Table 1). This is believed to be because CB ablation procedures require larger sheaths for LA access than RF ablations.
- ▶ This study investigated the incidence of persistent iASDs and the predictive factors in patients undergoing second-generation cryoballoon ablation for paroxysmal atrial fibrillation.

METHODS

- ▶ Transseptal puncture was performed in 83 patients using a Baylis Medical radiofrequency (RF) needle and standard 8F sheath. A 15F steerable sheath was used for the ablation.
- ▶ Patients underwent pre-procedural CT, as well as TTE before and after the procedure.
- ▶ An atrial septal defect was evidenced by a patent opening in the interatrial septum and/or color Doppler flow using a Valsalva maneuver.

RESULTS

- ▶ **Incidence:** 8.4% of patients had persistent iASD at a median of 15.5 (6.8-17.3) months, with a median size of 3.4 (2.6-4.0) mm.
- ▶ **Symptoms:** No iASD-related adverse events or symptoms (e.g. paradoxical emboli, heart failure or migraine headaches) occurred during a median of 17.7 (14.4-23.3) months of follow-up.
- ▶ **Predicting factors:** Multivariate analysis of CT images indicated that atrial septal angle was the only significant factor predicting a persistent iASD (odds ratio 0.764) with a minimum optimal atrial septal angle of 57.5°.

DISCUSSION & CONCLUSIONS

- ▶ **Persistence:** Persistent iASDs were detected in 8.4% of patients at a median of 15.5 months after second-generation CB ablation using a 15F steerable sheath. This is consistent with findings from the PROTECT AF study (Singh et al²) using a similar-sized sheath for left atrial appendage closure.
- ▶ **Atrial septal angle:** The atrial septal angle may be a predictor of persistent iASDs possibly due to the high forces on the puncture hole while maneuvering a large stiff sheath to reach and isolate the pulmonary veins.

Table 1 Summary of studies describing persistent iASDs in Watanabe et al, 2018

	Rillig et al, 2008 ¹	Singh et al, 2011 ²	Cronin et al, 2013 ³		Watanabe et al, 2018
Procedure type	RF ablation	WATCHMAN™ Device	RF ablation	CB ablation (1 st gen)	CB ablation (2 nd gen)
Sheath size	8F	14F	8F	15F	15F
Follow-up time	12 months	12 months	4 months	4 months	15.5 months
Incidence of iASD	3.7%	7%	2.4%	16.7%	8.4%

REFERENCES: 1. Rillig et al. *J Interventional Cardiology Electrophysiology*. Sep 2008;22:177-181. 2. Singh et al. *Circulation: Arrhythmia and Electrophysiology*. Apr 2011;4:166-171. 3. Cronin et al. *J American College of Cardiology*. Oct 2013;62:1491-1492.