Cryoballoon ablation for paroxysmal atrial fibrillation in the presence of an Amplatzer Septal Occluder device

Jubran A. Rinda, John L. Bylb, Bennett P. Samuelb, Joseph J. Vettukattilb, c, Nagib T. Chalfoun c, d, *

a Grand Rapids Medical Education Partners, Grand Rapids, MI, USA
b Congenital Heart Center, Helen DeVos Children’s Hospital of Spectrum Health, Grand Rapids, MI, USA
c Michigan State University College of Human Medicine, Grand Rapids, MI, USA
d Division of Cardiovascular Medicine, Frederik Meijer Heart and Vascular Institute, Spectrum Health, Grand Rapids, MI, USA

A R T I C L E   I N F O

Article history:
Received 24 May 2016
Received in revised form 1 November 2016
Accepted 4 November 2016
Available online 5 November 2016

Keywords:
Atrial fibrillation
Cryoballoon ablation
Septal closure device

A B S T R A C T

Cryoballoon ablation of the pulmonary veins (CAPV) has been demonstrated to be non-inferior to radiofrequency (RF) ablation for paroxysmal atrial fibrillation (AFib). As CAPV requires a larger transseptal sheath than RF ablation, it can be challenging in the presence of an Amplatzer™ Septal Occluder (ASO) device. Real-time three-dimensional transesophageal echocardiography (RT3DTEE) provides enhanced visualization of various complex cardiac defects and has revolutionized interventional procedures by guiding catheter positioning. We describe successful RT3DTEE guided transseptal puncture for CAPV of paroxysmal AFib in the presence of an ASO in a 53-year-old male.

Copyright © 2016, Indian Heart Rhythm Society. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

A 53-year-old man presented with drug refractory paroxysmal atrial fibrillation (AFib). His history included coronary artery disease, cryptogenic stroke with a large persistent foramen ovale, which was closed with a 30 mm Amplatzer™ Multi-Fenestrated Septal Occluder (ASO; St. Jude Medical, Inc., St. Paul, MN, USA) at the age of 50 years. He developed paroxysmal AFib and failed amiodarone therapy. He complained of extreme fatigue during AFib limiting his activities. Cryoballoon ablation of the pulmonary veins (CAPV) was recommended to treat his paroxysmal AFib.

2. Case report

During CAPV, catheter movements were guided by real-time three-dimensional transesophageal echocardiography (RT3DTEE) to visualize the ASO. An appropriate site for transseptal puncture (TSP) was found just anterior and inferior to the ASO. An 8.5 F TorFlex™ Transseptal Guiding Sheath (Baylis Medical, Montreal, Canada) and a 71 cm radiofrequency (RF) transseptal needle (NRG™ Transseptal Needle; Baylis Medical) were used for TSP. An Amplatz Super Stiff™ guidewire (Boston Scientific, Marlborough, MA, USA) was used to allow for significant support needed to exchange the FlexCath™ Steerable Sheath (Medtronic, Minneapolis, MN, USA) over the wire (Fig. 1). The transseptal sheath was exchanged for a 15 F cryoballoon FlexCath™ sheath (Fig. 2). A 28 mm cryoballoon with a 15 mm Achieve™ Mapping Catheter (Medtronic, Minneapolis, MN, USA) was advanced into the left atrium. Intracardiac echocardiography (ICE) was used throughout the procedure to verify pulmonary vein (PV) balloon occlusion and rule out pericardial effusion. Due to the limited space for TSP of the native septum, ICE and RT3DTEE were used for catheter positioning anterior and inferior to the ASO.

The patient had four PVs with normal anatomy. Lesions were applied to all PVs with phrenic monitoring throughout, which showed no evidence of phrenic slowing. Entrance and exit block were performed on the veins and following this, all veins were found to be free of signal. The patient was discharged after overnight observation without any complications. At his three-month follow up visit, he did not have any recurrent AFib.

CAPV has been shown to be non-inferior to RF ablation for treating paroxysmal AFib [1,2]. RF ablation of AFib has been shown...
to be safe and effective in patients with atrial septal defect closure devices [3]. However, CAPV has not been previously reported as a rhythm control strategy for paroxysmal AFib in the presence of an ASO. Due to the large FlexCath® sheath (15 F) required for TSP, it was unclear whether CAPV would be feasible in the presence of an ASO. Prior reports have demonstrated the feasibility of TSP using RF ablation with up to a maximum sheath size of 8.5 F [4]. This case demonstrates that TSP can be performed in portions of the native septum under RT3DTEE guidance. Fewer artifacts were noted on RT3DTEE than on ICE.

3. Conclusions

CAPV for paroxysmal AFib in the presence of an ASO was performed safely and effectively in one patient, and provides electrophysiologists with an additional option to treat atrial arrhythmias in patients with intracardiac devices. The larger sheath combined with the flexibility of the FlexCath® sheath made it possible to maneuver across a thick septum with an ASO without difficulty and allowed for improved torque. RT3DTEE was useful in selecting a safe transseptal site without significant artifact. The use of CAPV for AFib in patients with closure devices with TSP under RT3DTEE guidance is possible in such patients.

Funding sources

None.

Disclosures

None.

References

[1] Luik A, Radzewitz A, Kieser M, Walter M, Bramlage P, Hörmann P et al. Cryoballoon versus open irrigated radiofrequency ablation in patients with
paroxysmal atrial fibrillation: the prospective, randomized, controlled, non-inferiority FreezeAF study. Circulation 2015;132:1311–9.

[2] Kuck KH, Brugada J, Fürnkranz A, Metzner A, Duyang F, Chun KR, et al. Cryoballoon or radiofrequency ablation for paroxysmal atrial fibrillation. N Engl J Med 2016;374:2235–45.

[3] Santangeli P, Di Biase L, Burkhardt JD, Horton R, Sanchez J, Bailey S, et al. Transseptal access and atrial fibrillation ablation guided by intracardiac echocardiography in patients with atrial septal closure devices. Heart Rhythm 2011;8:1669–75.

[4] Bartoletti S, Santangeli P, Di Biase L, Natale A. Catheter ablation of atrial fibrillation in patients with hardware in the heart: septal closure devices, mechanical valves and more. J Atr Fibrillation 2013;6:145–51.