Cryoballoon Pulmonary Vein Isolation After Lung Lobectomy

Hariharan Raju, MBCnB, PhD, John Gomes, MB BS, Hanney Gonna, MBBS, BSc, Mark M. Gallagher, BSc, MD

Residual pulmonary vein stumps following pneumonectomy remain electrically active as potential triggers for atrial fibrillation. Efficacious radiofrequency pulmonary vein isolation has recently been reported in a series of 15 cases (1), though none with cryoablation to our knowledge. We present here an image illustrating the feasibility of Arctic Front Advance cryoballoon (Medtronic, Minneapolis, Minnesota) ablation following video-assisted thoracoscopic right upper lobectomy for adenocarcinoma.

The patient was a 60-year-old man with symptomatic paroxysmal atrial fibrillation. Echocardiography was unremarkable apart from mild left atrial dilation at 45 mm. Contrast venography of all 4 pulmonary veins (PV), including the right superior PV stump (Figure 1A), was performed through a FlexCath sheath (Medtronic) and 7-F National Institutes of Health (Bethesda, Maryland) catheter. Less than -45°C temperature was achieved for 2 freezes of 240 s in the right superior PV (Figure 1B) with a 28-mm cryoballoon; PV potential mapping with Achieve catheter (Medtronic) confirmed isolation (Figure 1). The 3 intact PVs were similarly isolated. The patient remained symptom-free for a 3-month follow-up period, with no sustained arrhythmia on 24-h ambulatory monitor.

REPRINT REQUESTS AND CORRESPONDENCE: Dr. Hariharan Raju, Cardiology Department, Ben Weir Ward Office, St. George’s Hospital, London SW17 0QT, United Kingdom. E-mail: drhraju@doctors.org.uk.

From the Cardiology Department, St. George’s Hospital, London, United Kingdom. Dr. Gonna has received unrestricted research funding from Biosense Webster and Boston Scientific. Dr. Gallagher has received research funding from and has consulted for Medtronic. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Manuscript received May 11, 2015; revised manuscript received June 1, 2015, accepted June 4, 2015.
REFERENCE


KEY WORDS atrial fibrillation, atrial fibrillation ablation, cryoballoon, pneumonectomy, pulmonary vein isolation, pulmonary vein stump

(A) National Institutes of Health catheter in right superior pulmonary vein (RSPV) for venogram and quadripolar catheter in coronary sinus, with pre-ablation RSPV electrograms; (B) vein stump occlusion with 28-mm cryoballoon with Achieve circular mapping catheter in stump during right phrenic nerve pacing (by quadpole, distal tip not seen), with post-ablation RSPV electrogram confirming isolation. Electrograms annotated: PV is Achieve catheter bipolar electrograms in RSPV (PV1 is distal pole); CS3,4 and DCS represent proximal and distal bipoles from quadpole positioned to pace right phrenic nerve (no signals seen); I, aVF, and V2 are surface ECG recordings. AP = anteroposterior.