

Successful PV Isolation of a Left Atrial Roof and Two Common PVs Using a Visually-Guided Laser Balloon Ablation Catheter

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INTRODUCTION

- Pulmonary vein isolation (PVI) can be achieved using a visually-guided laser balloon ablation catheter (BAC).
- The BAC (**Figure 1**) is delivered through a 12F deflectable sheath and has
 - real-time in vivo visualization using a 2F endoscope
 - an adjustable aiming arc which can be maneuvered circumferentially & longitudinally
 - laser energy (980 nm) which is delivered at the location of the aiming arc to ablate tissue.
- The BAC is compliant and can conform to a variety of PV shapes and sizes. The diameter of the ring of tissue contact can be adjusted through:
 - the position of the BAC in the PV ostium, and
 - the degree of balloon inflation.
- We present a case where PVI was accomplished successfully with the BAC in a patient with a left atrial roof and two common PVs.

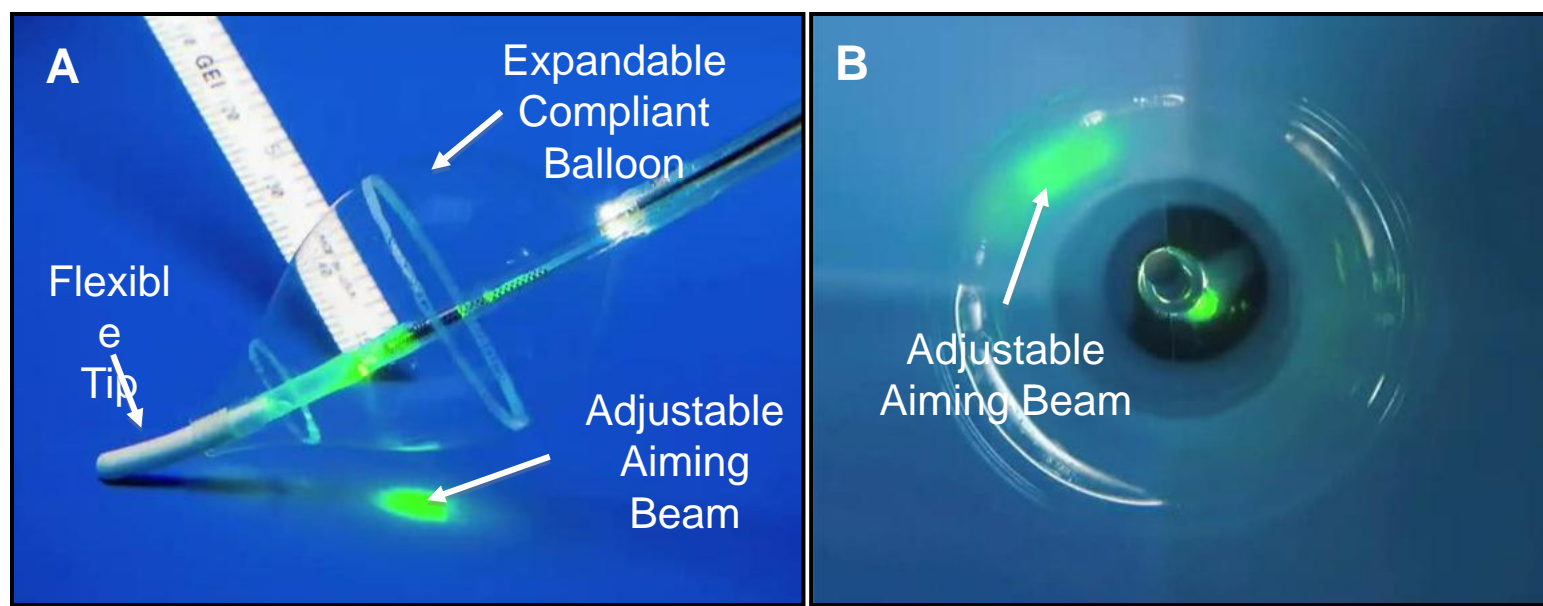


Figure 1. (A) The visually-guided laser balloon ablation catheter is shown. It consists of a compliant balloon, flexible tip, and adjustable aiming arc that can be manipulated to determine the site of energy delivery. (B) An endoscopic view during ablation around the PV is shown. Often it is necessary to ablate in areas with blood overlap.

CASE REPORT

- A 49-year old man with paroxysmal atrial fibrillation refractory to propafenone and metoprolol underwent PVI with the BAC.
- Pre-procedural computed tomography (CT) scan demonstrated a common left PV, a common right PV, and a roof vein.
- After LA access was obtained and intravenous heparin administered, the deflectable sheath was positioned near the ostium of each target PV.
- The BAC was partially advanced into each PV and inflated at the ostium under endoscopic visualization until tissue contact was optimized.
- Utilizing visual guidance and the aiming arc, laser energy was applied in a circumferential and overlapping manner (30-50% overlap) around each PV.
- Electrical PV isolation was assessed utilizing a circular mapping catheter (for the LCV & RCV), immediately post-ablation and 30 minutes after. For the LA roof vein, a decapolar catheter was used to assess for presence of PV electrograms and exit block

ABLATION

- The anatomy and dimensions of the three PVs based on CT scan was as follows
 - Left common PV, diameter=32 mm
 - Right common PV, diameter=28mm
 - Left atrial roof PV, diameter=7 mm.
- The BAC was successfully positioned at each PV ostium and inflated to achieve tissue contact (**Figure 2**).
- Laser lesions was applied in a circumferential and overlapping manner around each PV to achieve electrical isolation.
- The ablation characteristics are detailed in **Table 1**.
- Each PV was isolated after the placement of the initial encircling lesion set.
- Electrical isolation was present ≥ 30 minutes post-ablation (**Figure 3**)
- A 3D bipolar voltage map of the left atrium using CT registration (CARTO) was performed to show the level of electrical isolation (**Figure 2**).
- At 6 months follow-up, the patient is free of atrial fibrillation and is off antiarrhythmic drugs.

	LCV	Roof Vein	RCV	Total
Diameter (mm)	32	7	28	
# Lesions	84	20	49	253
Laser Time (min)				65.1
Time Required to Isolate (min)	30	13	64	107
Fluoroscopy Time (min)				11.3
Attempts Required to Isolate	1	1	1	

Table 1. Ablation Characteristics..

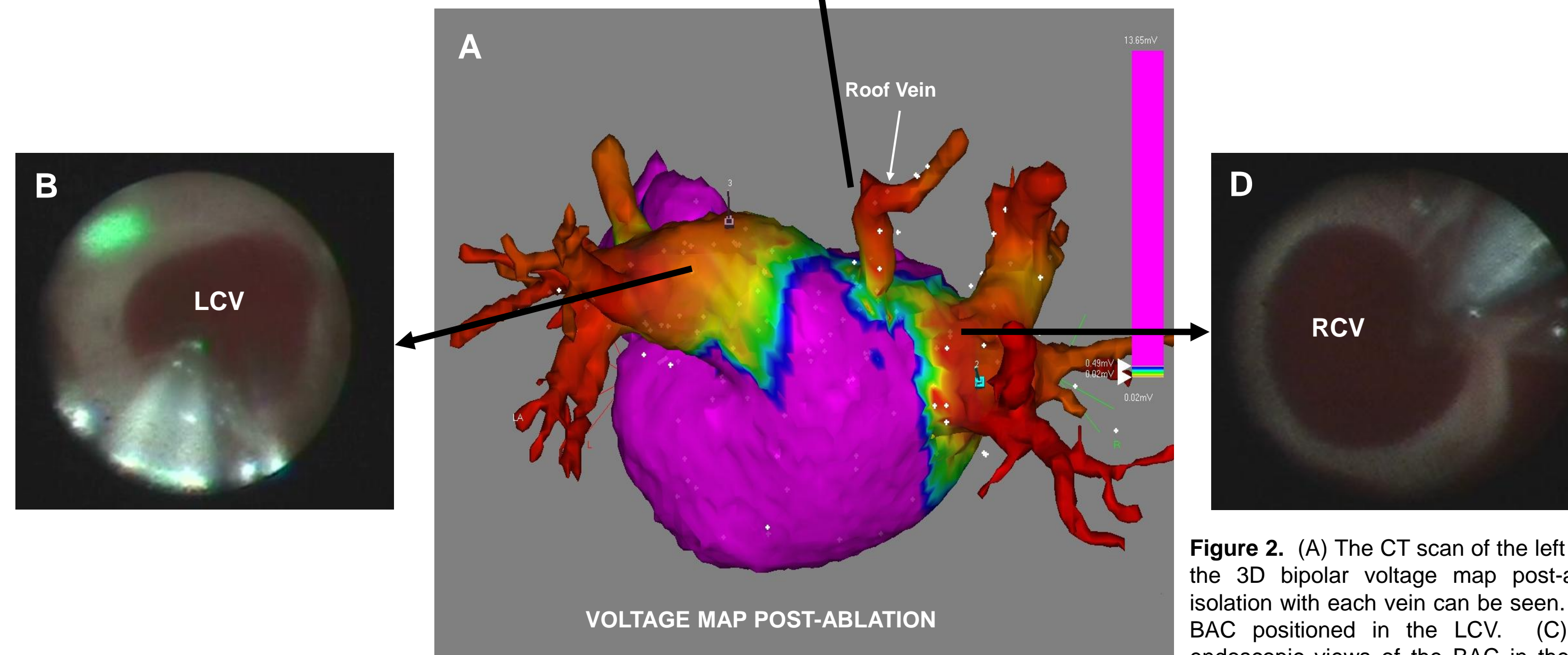
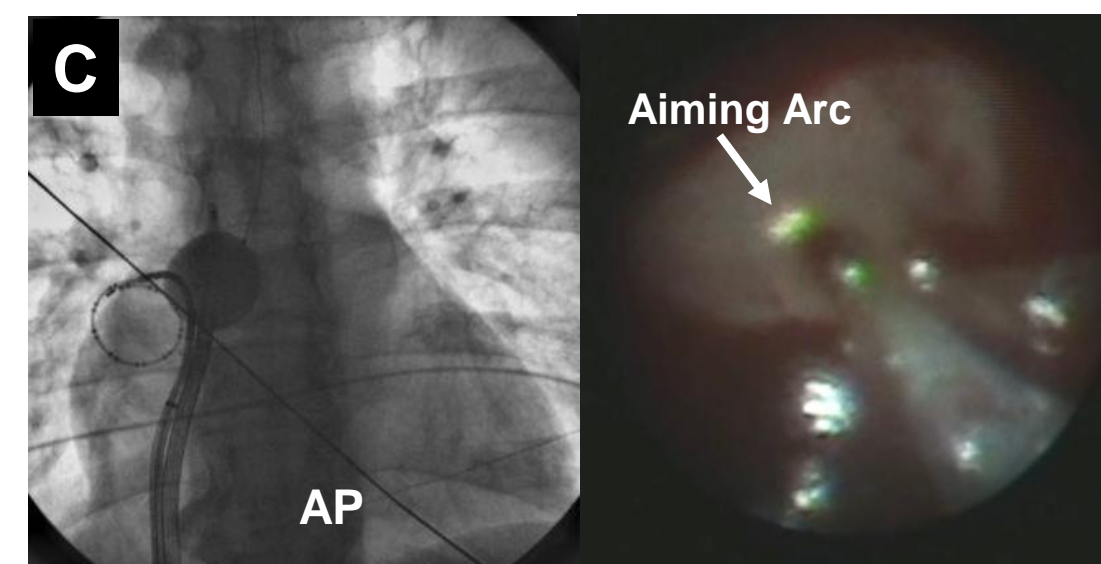


Figure 2. (A) The CT scan of the left atrium was registered to the 3D bipolar voltage map post-ablation. The level of isolation with each vein can be seen. (B) Endoscopic view of BAC positioned in the LCV. (C) The fluoroscopic and endoscopic views of the BAC in the left atrial roof vein are shown. (D) Endoscopic view during ablation around the RCV.

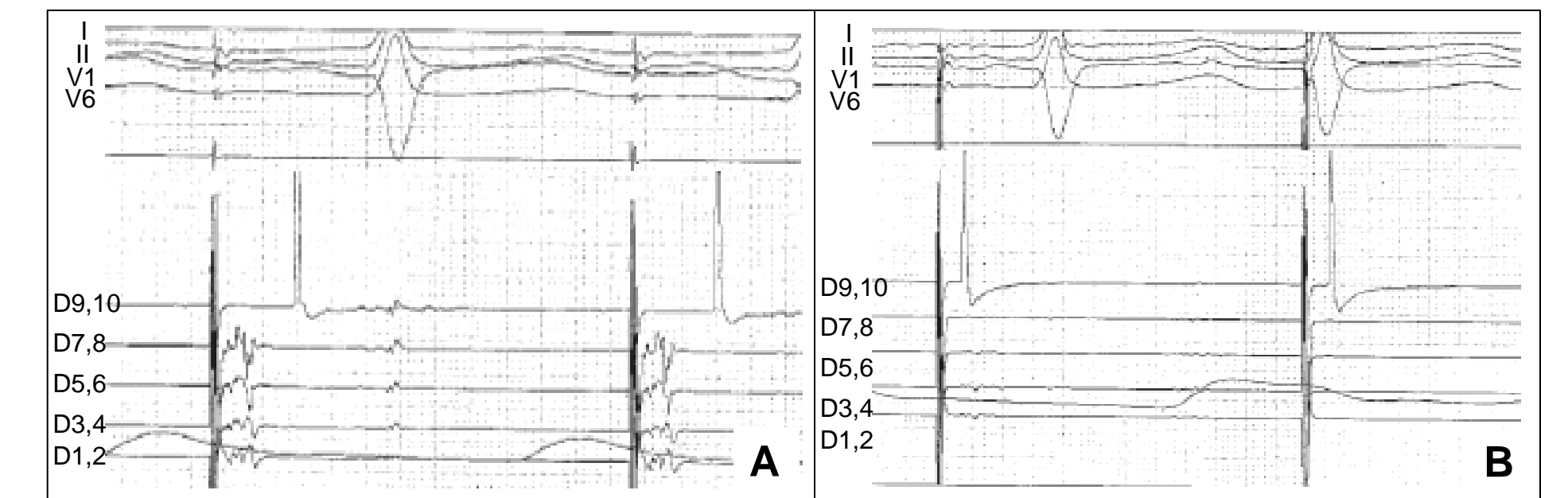


Figure 3. (A) Pre-ablation EGMs from the roof vein are shown in the decapolar catheter that was positioned in the PV. There are distinct electrograms seen with capture of the LA with pacing. (B) Post-ablation the EGMs are not present and there is exit block from the PV.

DISCLOSURES

- Research Grant – CardioFocus, Inc.
- Andre d'Avila, Petr Neuzil, Vivek Reddy
- Remaining Authors – None

CONCLUSIONS

- Using the compliant, visually-guided laser balloon ablation catheter pulmonary vein isolation can be achieved in a variety of PV anatomic variants.