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Pulmonary vein isolation using cryoballoon technique in atrial fibrillation patient after Greenfield vena cava filter implantation

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ABSTRACT

Background: Cryoballoon ablation is an established procedure for atrial fibrillation (AF). Patient with vena cava filter undergoing pulmonary vein isolation (PVI) were seldom reported.

Case presentation: We describe an AF ablation technique using the second generation cryoballoon in a patient after vena cava filter implantation. All pulmonary veins were successfully isolated without complication.

Conclusions: For AF patient with previously implanted vena cava filter, cryoballoon based PVI appears feasible and safe.

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INTRODUCTION

Catheter ablation is an effective therapeutic option in treating patients with atrial fibrillation, pulmonary vein isolation (PVI) remains the cornerstone ablation strategy (AF) regardless the classification of the AF¹. Cryoballoon ablation is an established procedure for patients with symptomatic atrial fibrillation (AF).

An inferior vena cava filter is a medical device implanted into the inferior vena cava to prevent pulmonary emboli in patient with venous thromboembolism. Patients who had previous vena cava filter undergoing PVI were seldom reported. The major concern for such clinical scenario is mechanic dislodgement of the filter device during the ablation procedure.

Case

A 76 years old female patient was admitted to our center because of symptomatic drug-refractory persistent atrial fibrillation (AF). The CHA₂DS₂-VASc score was 4 and HAS-BLED score was 3. A Greenfield-Filter was previously implanted due to venous thromboembolism and recurrent pulmonary emboli.

Abdominal computed tomography (CT) scan was performed; no device-related thrombus was detected (Figure 1). Intracardiac thrombus was ruled out by transesophageal echocardiography (TEE). After fully discussion, we decided to perform AF ablation using the cryoballoon (CB) technology. Full consent of the patient was obtained before the procedure.

The institutional approach of CB ablation was published previously²⁻⁴. The key procedural techniques were detailed in Figure 2. In this case, after single groin puncture, the CB steerable sheath (12F, Flex Cath Advance, Medtronic) was carefully advanced into the right superior vena cava through the Greenfield Filter using “over the wire” technique.

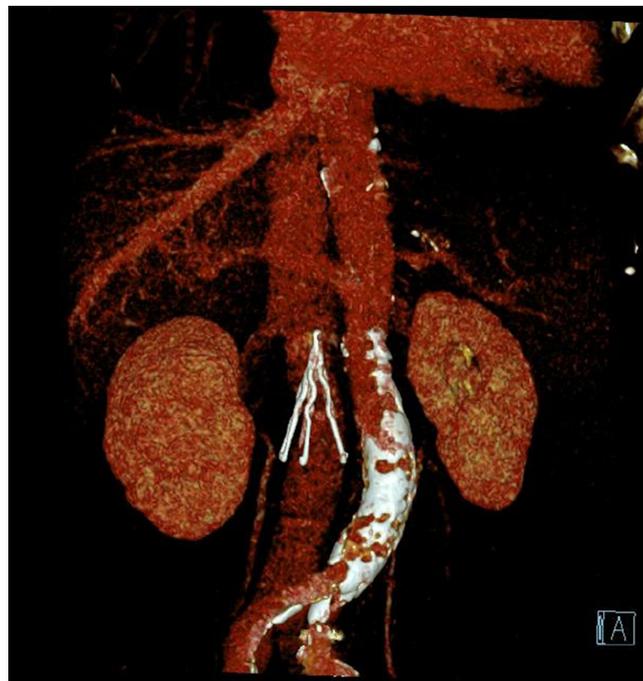


Figure 1 CT shows inferior vena cava filter.

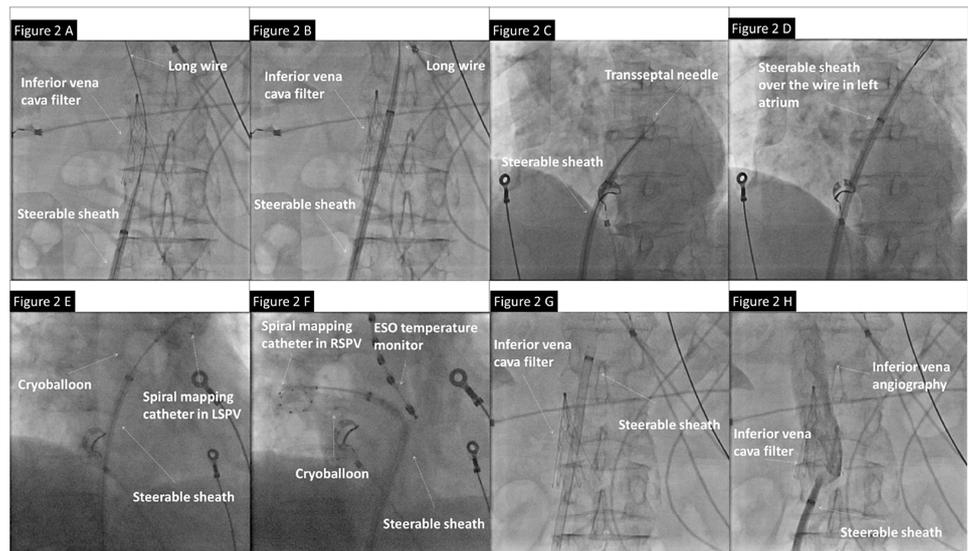


Figure 2 CB PVI in patient with inferior vena cava filter.

After single transseptal puncture using the modified Brockenbrough technique (BRK-1 needle, St Jude Medical; Flex Cath Advance steerable sheath, Medtronic), selective PV angiography was performed to identify the pulmonary veins. A second-generation cryoballoon (CB 2, Arctic Front Advance, Medtronic) was utilized for PVI. All four PVs were successfully isolated with time-to-effect guided freeze approach⁵. By the end of the procedure, the cryoballoon and steerable sheath were safely withdrawn without dislodgement of the Greenfield-Filter device.

The patient was scheduled for outpatient clinic visit at 3, 6, 12 months after the procedure. The Follow-up assessments showed favorable outcome without clinical AF/AT recurrence.

What have we learned?

An inferior vena cava filter is a medical device implanted into the inferior vena cava to prevent pulmonary emboli in patient with venous thromboembolism. Patients who had previous vena cava filter undergoing catheter ablation for atrial fibrillation were seldom reported. The major concern for such clinical scenario is mechanic dislodgement of the filter device during the ablation procedure. This report shows that for AF patient with previously implanted vena cava filter, a step-by-step approach based cryoballoon ablation appears feasible and safe.

CONFLICT OF INTEREST

None.

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