

Percutaneous Retrieval of an Entrapped Ablation Catheter during a Retrograde Approach for a Left Free Wall Accessory Pathway

Hung-Kai Huang^{1,3}, Li-Wei Lo^{1,2}, Yenn-Jiang Lin^{1,2}, Ching-Hui Huang³ and Shih-Ann Chen^{1,2*}

¹Division of Cardiology, Department of Medicine, Taipei Veterans General Hospital, Taipei, Taiwan

²Institute of Clinical Medicine, and Cardiovascular Research Institute, National Yang-Ming University, Taipei, Taiwan.

³Division of Cardiology, Department of Medicine, Changhua Christian Hospital, Changhua, Taiwan

Abstract

A 25-year-old man suffered from repeated attacks of orthodromic atrioventricular reciprocating tachycardia utilizing a left lateral accessory pathway (AP) for retrograde conduction. The catheter was approached through the aorta to map the AP and was entrapped in the mitral valve apparatus, and it had a broken internal wire. A snare-assisted technique was successfully utilized to retrieve the catheter.

Keywords: Ablation catheter; Complication; Left ventricle

Introduction

Radiofrequency ablation is currently the treatment of choice for cardiac arrhythmia. The complication rate of radiofrequency ablation is 3.1% [1]. Although a broken internal wire in a radiofrequency catheter is not rare, a catheter's becoming entrapped in the mitral valve apparatus is uncommon during the manipulation of catheters.

Case Report

A 25-year-old man suffered from repeated attacks of orthodromic atrioventricular reciprocating tachycardia with the use of a left lateral AP for retrograde conduction. A transaortic approach was performed with an EPT 4 mm ablation catheter (Blazer II HTD, standard curve, Boston Scientific, USA) constructed with an internal steering wire via a right femoral artery access. While mapping the AP in the mitral sub-valvular area, the catheter dropped into the posterior lateral left ventricle (LV) and could no longer be maneuvered. The catheter was trapped by the mitral valve apparatus and could not be withdrawn directly from the LV.

Next, we attempted to use a snare-assisted technique to retrieve the catheter. As shown in Figures 1a-1f and Figures 2a-2i (cartoon diagram), a 0.018 inch guide wire (choice PT extra-support) with a wire tip shaped into a J-curve and a snare catheter (ev3, Amplatz goose neck, 102 cm, 7 mm) were advanced into the aortic arch over a 6 French multipurpose guide catheter through a 7 French sheath via the left femoral artery access. The wire was first looped across the ablation catheter in the aortic arch. The snare catheter was used to catch the wire tip to form a large snare system surrounding the ablation catheter. After holding the snare catheter and withdrawing the wire and snare catheter simultaneously, we clipped the ablation catheter. The snare system was later slid into the LV along the ablation catheter to clip the distal portion of the ablation catheter. With the snare system firmly held, little force was required to smoothly retrieve the tip of the ablation catheter. Although the outward appearance of the ablation catheter was intact (Figure 1e), the internal catheter wire was found to be broken under fluoroscopy (Figures 1f). Next, we proceeded with an ante-grade approach with a trans-septal procedure, and radiofrequency ablation was performed successfully. The echocardiogram 6 months later showed only mild mitral valve regurgitation without structural abnormality. The total procedure time was 3 hours and 20 minutes, the fluoroscopic time was 1 hour and 10 minutes and the total radiation dose received for this entire procedure was 0.286 μ Gy \cdot cm².

Discussion

A trans-aortic approach for the ablation of a ventricular tachycardia

with an LV origin or supraventricular tachycardia involving the left AP is useful but poses potential risks. Reports of catheter entrapment in the mitral valve apparatus are rare; however, they may possibly be under-reported [1-4]. The forceful removal of an ablation catheter may be dangerous due to the risk of rupturing the LV or tearing of the mitral

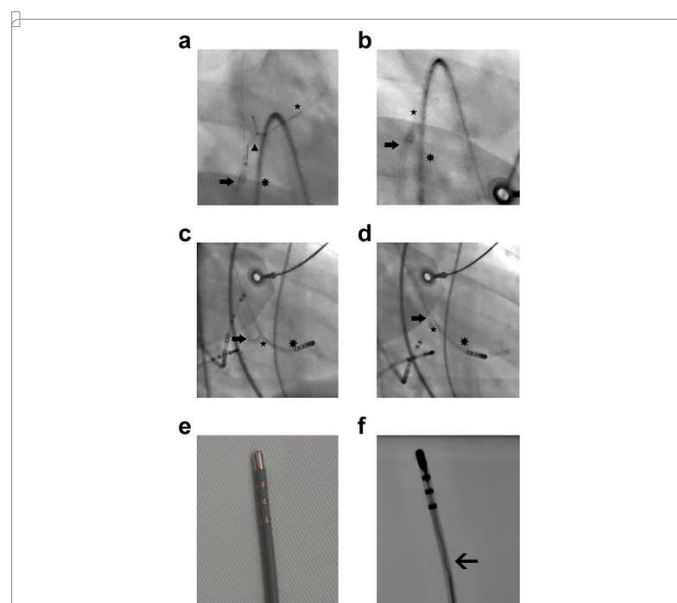


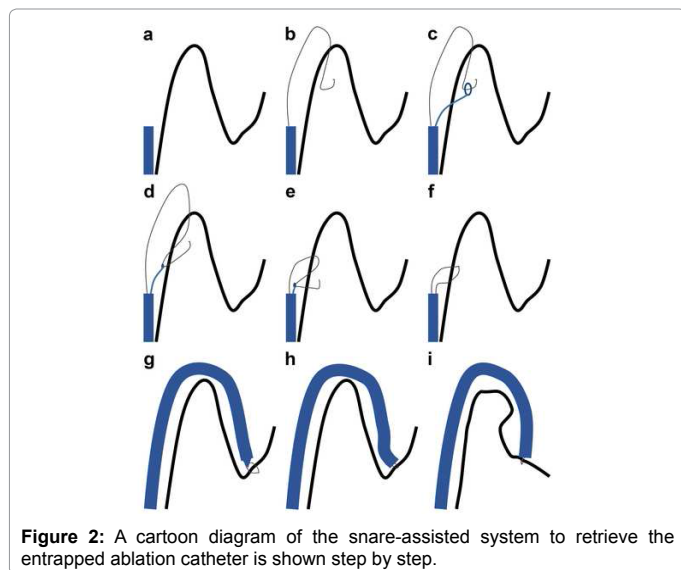
Figure 1: The snare catheter (arrow head) over a 6 Fr multipurpose guide catheter (arrow) catching the 0.018-inch wire (small asterisk) in the aortic arch (panel a). The snare system (small asterisk) catching the ablation catheter (large asterisk) in the aortic arch (panel b). The snare system is slid into the LV along the ablation catheter (panel c). The entrapment ablation catheter is extracted by holding force on the snare system (panel d). Gross view of ablation catheter (panel e). The broken internal wire (arrow) of the ablation catheter under a fluoroscopic view (panel f). Panels a-d are in the anteroposterior projection.

***Corresponding author:** Shih-Ann Chen, Division of Cardiology, Department of Medicine, Taipei Veterans General Hospital, Taipei, Taiwan, Tel: +886 2 2871 2121; E-mail: epsachen@ms41.hinet.net

Received January 07, 2016; **Accepted** February 21, 2016; **Published** February 25, 2016

Citation: Huang H, Lo L, Lin Y, Huang C, Chen S (2016) Percutaneous Retrieval of an Entrapped Ablation Catheter during a Retrograde Approach for a Left Free Wall Accessory Pathway. J Clin Case Rep 6: 717. doi:10.4172/2165-7920.1000717

Copyright: © 2016 Huang H, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.



valve apparatus. When a catheter becomes entrapped in the LV, surgical removal is sometimes necessary.

The techniques utilizing a snare loop for extracting intravascular foreign objects are the primary choice because of the low complication rate. The risks associated with significant radiation exposure during

snare-assisted techniques are acceptable relative to the risks of surgical intervention [5]. In this study, we provide details of a simple self-made wire snare to remove a broken ablation catheter from the LV safely. This technique can be safely performed to address this rare complication.

Acknowledgment

The present work was supported by the Taipei Veterans General Hospital (V105C-116, V105C-060).

References

1. Chen SA, Chiang CE, Tai CT, Cheng CC, Chiou CW, et al. (1996) Complications of diagnostic electrophysiologic studies and radiofrequency catheter ablation in patients with tachyarrhythmias: an eight-year survey of ,966 consecutive procedures in a tertiary referral center. *Am J Cardiol* 77: 41-46.
2. Kim KH, Choi KJ, Kim SH, Nam GB, Kim YH (2012) Ablation catheter entrapment by chordae tendineae in the mitral valve during ventricular tachycardia ablation. *J Cardiovasc Electrophysiol* 23: 218-220.
3. Salguero-Bodes R, Arribas-Ynsaurriaga F, Lopez-Gil M, Cortina-Romero JM (2008) Catheter entrapment in the mitral subvalvular apparatus during accessory pathway ablation. *Rev Esp Cardiol* 61: 546-548.
4. Desimone CV, Hu T, Ebrille E, Syed FF, Vaidya VR, et al. (2014) Catheter ablation related mitral valve injury: the importance of early recognition and rescue mitral valve repair. *J Cardiovasc Electrophysiol* 25: 971-975.
5. Nof E, Lane C, Cazalas M, Cuchet-Soubelet E, Michaud GF, et al. (2015) Reducing radiation exposure in the electrophysiology laboratory: it is more than just fluoroscopy times! *Pacing Clin Electrophysiol* 38: 136-145.