GLOBAL VOICES

Retrieval of fragmented coronary sinus catheter in the right atrium: A first novel multidisciplinary approach in sub-Saharan Africa

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Intravascular fracture of electrophysiology diagnostic catheters is uncommonly reported. Intravascular retrieval methods have been described for a variety of endovascular catheters and foreign bodies. Among them, the loop snare method has been used with high success.[1] Reusable electrophysiology diagnostic catheters may be at greater risk for suboptimal performance, as previously described.[2] To the best of our knowledge, in the sub-Saharan Africa region, there have been no reports of a coronary sinus (CS) catheter fracturing in the vascular system.

In the past 5 years, 48 electrophysiology procedures from supraventricular tachycardia have been performed at our center by using CS diagnostic catheters some of which being previously used. A 40-year old woman was referred to our hospital for diagnostic electrophysiology study and ablation for a recurrent paroxysmal narrow-complex tachycardia. Following informed consent, a 7F sheath was introduced on the left femoral vein (LFV). Quadripolar diagnostic catheters were placed at the high right atrium (RA), the bundle of His, and the right ventricular apex for signal recording and the electrophysiological study. A 6F deflectable decapolar catheter, previously used once, was introduced through the LFV and advanced into the RA via the inferior vena cava and then advanced to engage the CS ostium.

During routine counterclockwise rotation, fluoroscopy demonstrated fragmentation of the catheter along a 5-cm length and extending into the RA. The insulation cover was completely ruptured exposing the inner components. The insulation fragments were clearly floating within the RA.

KEY FINDINGS

- Electrophysiology procedures are on daily increase partly due to an increase in the number of centers performing these procedures and an increase in the burden of noncommunicable diseases.
- Low- and middle-income countries face not only a critical scarcity of electrophysiology services, but also the higher cost of consumables subjecting them to the reuse protocol.
- These consumables are likely to cause complications such as fragmentation of catheters, as reported in this research letter.
- When catheter breakage happens, percutaneous retrieval should be attempted; however, vascular surgery plays a key role to success when percutaneous retrieval alone is not successful.

However, they were not detached from the catheter. We withdrew the catheter into the right femoral vein (RFV), but we were unable to pull it into the sheath. As the patient was stable, we decided to complete the procedure and then readdress the fragmented catheter. A new diagnostic catheter was advanced via the LFV. Mapping and ablation of the slow pathway was successful. Following this, attention was directed to removal of the fragmented catheter.

Since the 7F sheath was inadequate to accommodate the fragmented catheter, a wide lumen sheath (11F) was introduced to the RFV. The snaring tools were then introduced through this sheath and advanced to the level of the CS catheter tip and started to maneuver to catch it. Having caught the tip, we pulled down all of the materials to the sheath. The idea was that by pulling the CS sheath antegrade toward the RFV, the spreading fragments would wrap around the sheath and reduce the size for easy retrieval. The attempt failed because

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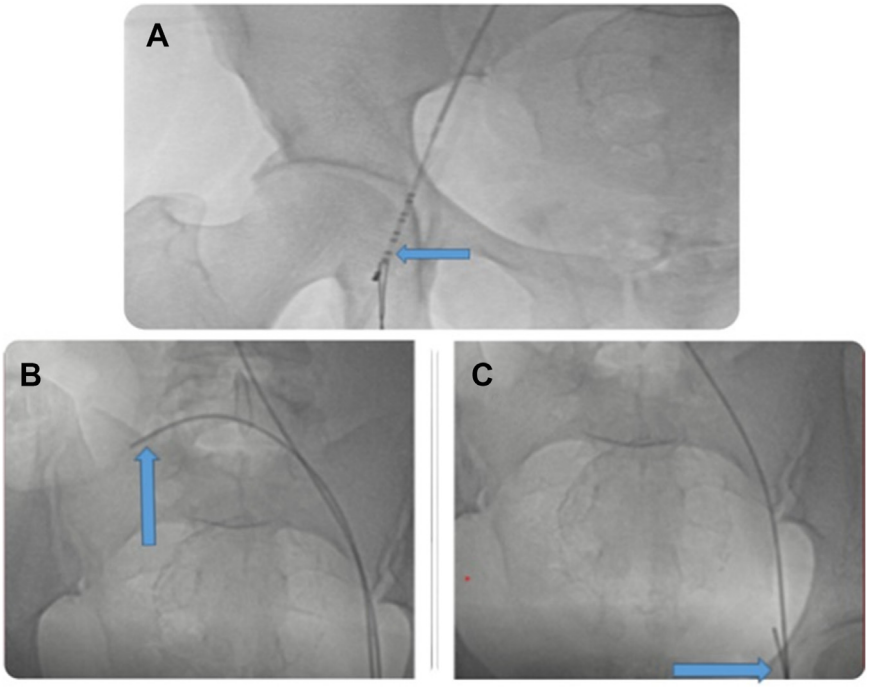

Figure 1 The snare is holding the fragmented coronary sinus catheter between the distal and C7/8 poles **(A)**, and the distal part of coronary sinus catheter retracting from the right femoral vein **(B)** to the left femoral vein **(C)**. The arrow shows where the catheter is fragmented and a flap of the catheter peeled off.

the tip of CS catheter could not be directed into the sheath; instead, it slipped off. We abandoned the retrieval process using the snare to avoid causing a tear in the RFV and made the decision for an open extraction via the LFV with manual retrieval of the entire catheter (Figure 1A).

Tanzania and the sub-Saharan African countries face a critical scarcity of electrophysiology services and higher cost of consumables. The reuse protocol enables these societies to access services at lower cost.[3] A survey of 34 countries reported use of reprocessed consumables in 67%.[2] While malfunction of a diagnostic electrophysiology catheter is unusual, previously used catheters may be at higher risk for poor performance. Operators need to understand these complications and be educated on retrieval methods.[4] Fragmentation of the catheter exposes its inner wires, which can cause venous dissection and thromboembolic complications. In 2020, Lee and colleagues[5] reported the entrapment of a steerable duodecapolar catheter in the Thebesian valve. The loop-snare method has been used successfully in a number of clinical situations in which catheters need to be removed from the vascular system. In our case, attempts to detach percutaneously failed; however, open-heart surgery was successful to retrieve the entrapped catheter (Figures 1B and 1C). The patient did well in follow-up without recurrent SVT or complication related to the catheter removal.

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References

1. Wang PC, Liang HL, Wu TH, et al. Percutaneous retrieval of dislodged central venous port catheter: experience of 25 patients in a single Institute. Acta Radiol 2009;50:15–20.
2. Duncker D, Svetlosak M, Guerra F, et al. Reprocessing of electrophysiology material in EHRA countries: an EHRA Young EP survey. Europace 2021;23:479–485.
3. Global Data Healthcare. Reprocessing of single-use devices lowers costs in cardiac operating suites. Available at: https://www.medicaldevice-network.com/comment/reprocessing-single-use-devices-costs/. Accessed June 6, 2022.
4. Richardson JD, Grover FL, Trinkle JK. Intravenous catheter emboli. Experience with twenty cases and collective review. Am J Surg 1974;128:722–727.
5. Lee E, Choi EK, Choi JW, Oh S. Entrapment of a steerable diagnostic electrophysiologic catheter in the Thebesian valve during radiofrequency catheter ablation for atrial fibrillation. HeartRhythm Case Rep 2020;6:847–849.