

A Case of Successful Retrieval of Migrated Device Fragment Using a Snare

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ABSTRACT

Procedural related intravascular foreign bodies in vascular and nonvascular areas sometimes leads to abrupt serious complications such as embolization, thrombus development, etc. and necessitating their removal. This can be achieved by avoiding procedural related errors and selecting the appropriate device. The present case represents successfully retrieval of fragmented tip of Simmons catheter using a snare in a 50-year-old woman without any serious consequences

Keywords: Catheter, Foreign body, Retrieval, Snare

INTRODUCTION

Use of Intravascular devices (IVD) has been increased worldwide which typically implanted percutaneously to achieve prolonged central venous access.⁽¹⁾ This

expanding use may lead to issues like electrode and wire leakage into the central circulation creating a rising concern along with the potential complications of retained foreign bodies.^(2, 3) The existence of such a complex issue with IVD in a patient demands prompt surgical or percutaneous retrieval during cardiac catheterization procedures. The first non-surgical retrieval of a migrating steel spring from the right atrium and inferior vena cava (IVC) using bronchoscopic forceps was described by Thomas et al. in 1964. Since then, studies on the retrieval of several IVD, including catheter shards, guidewires, closure devices, pacemaker wires, stents, embolization coils, sheaths, IVC filters, etc., have been reported. About 0.1% to 0.8% of coronary interventions are found to have such complex IVD occurrences. The clinical appearance of these patients varies

depending on the location of the complex IVD and its subsequent effects. Retrieval is required to prevent further obstacles including infections, thrombosis, ischemia, and perforation. Untreated foreign body embolism has been associated to significant consequences as frequently as 71% of the time, with fatality rates ranging from 24% to 60%.⁽³⁾ Current case depicted the fragmented tip of a Simmons catheter which had broken off during the treatment and entered the axillary artery was successfully retrieved using snare lifetec10.

CASE PRESENTATION

A 50-year-old woman was presented with angina and recurrent transient ischemia attack (TIA). TIA was confirmed by MRI technique. She had a history of diabetes and hypertension. The trans radial route was used to perform an angiography utilizing a 6F terumo sheath and Tiger catheter. An angiogram showed that the coronary functions were normal. As a result, to rule out internal carotid artery stenosis as the cause of a transient ischemic event, carotid artery imaging was necessary.

1. Fragmented catheter



2. Snatched with snare



3. Retrieving with snare



MRI technique confirmed stenosis in carotid vessels thus, Simmons catheter was inserted through the carotid vessels to resolve the existing situation. A guide wire was inserted through a Simmons catheter to perform the procedure. During the procedure, it was discovered that the catheter tip had broken and invaded an axillary artery. An 8 F sheath was placed into the femoral artery to recapture the catheter tip. The broken Simmons catheter tip was successfully retrieved using snare Lifetec 10. The patient was monitored for 24 hrs in the intensive care unit and no alteration was observed. On discharge patient was doing well with no adverse effect.

DISCUSSION

With the increase of endovascular therapies, interventional cardiologists and radiologists regularly encounter intravascular foreign bodies in vascular and nonvascular areas which are device dislodgment, catheter shards, embolization, displacement, knotting, entrapment, or device fragmentation.^(1,3) One of the severe consequences of endovascular therapies, is the risk of intravascular device or accessory dislodgment/embolism or fracture.⁽¹⁾

Once intravascular foreign bodies are discovered in vascular and nonvascular

areas, immediately it should be endovascularly extracted out. As the endovascular extraction procedure has high success rate and low morbidities in patients.⁽¹⁾ Regardless of how long an intravascular foreign body has been dislodged, it should be recovered due to the risk of arrhythmia, perforation, clotting, infections, and even death.⁽⁴⁾

The main causes of embolization/dislodgment are inadequate connections between the port and the intravascular catheter, catheter severing during insertion or removal, pinch-off syndrome, catheter fatigue, and/or operator inexperience. Pulmonary embolization of the broken catheters raises the likelihood of complications including thrombus formation and infection.⁽¹⁾ According to a study by Carroll et al., the procedure-related technical factors, such as loss of control, improper deployment, blind implantation without fluoroscopy, and incorrect size, were the most likely to occur in patients with intravascular devices (IVD) complications.⁽³⁾

Earlier the catheter fragment removal was mainly surgical, however, in recent years there have been sporadic occurrences of nonoperative removal of polyethylene catheter shards. Various equipment have been used such as ureteral stone catheters,

stomach biopsy forceps, and endoscopic forceps to retrieve fragments from the right atrium and great veins with some degree of success, but they cannot be advanced to the right ventricle or pulmonary artery due to lack of flexibility. Additionally, these equipment must be introduced via a venous cutdown rather than percutaneous method.⁽²⁾

To resolve the complications many conventional devices are available in the market for retrieval strategy such as gooseneck loop snares, baskets, pigtail, and Simmons catheter.⁽¹⁾

In current case, to resolve TIA and angina Simmons catheter was used through carotid vessels and during procedure tip was broken. Fragmented Simmons catheter tip was retrieved with the aid of snare lifetec 10. To the best of our knowledge, the current case is unique and relatively few studies from India have been reported with Simmons catheter. Similarly, Sood S. et al. has reported a case of unique two-step technique of successful removal of an embolized peripherally inserted central catheter line from the segmental branch of the left pulmonary artery using a Simmons catheter and a loop snare.⁽⁵⁾

These snare devices are composed of nitinol, which provides them flexibility, kink resistance, and shape memory qualities.⁽³⁾ As a result, the Simmons catheter followed by the use of a snare as a retrieval device is a safe and effective retrieval approach.

CONCLUSION

Procedural complications can be reduced by avoiding procedural errors and selecting the appropriate device. Though procedural difficulties, percutaneous recovery of such

devices has a higher degree of success and fewer complications. Thus, during the procedural retrieval of fragmented Simmons catheter with snare can be possible.

Conflict of Interest: None

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