

Accidental migration of ASH-split catheter during central venous catheter replacement: retrieval using an interventional radiology approach

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ABSTRACT: Catheter fracture and embolization of the distal fragment are well-known complications of subclavian central venous long-term cannulation. In hemodialysis it is an exceptional event. We report a case of accidental rupture of a cuffed hemodialysis catheter with distal migration of a fragment during a procedure of catheter exchange via guide-wire. According to most reported cases, intravascular catheter separation usually occurs completely asymptotically; our report confirms that catheter embolization itself is usually asymptomatic. Less than one third of the literature-reported cases have associated symptoms, such as palpitations or chest discomfort. Once diagnosed, treatment is an interventional radiological approach, which has a very high success rate. The replacement of permanent cuffed hemodialysis catheters via guide-wire is a delicate procedure and if catheter embolization is diagnosed, the patient must be referred to a center with specific experience in the retrieval of intravascular objects. (The Journal of Vascular Access 2001; 2: 64-67)

KEY WORDS: *Central venous catheters, Catheter embolization, Complications*

INTRODUCTION

Embolization of a catheter fragment is a rare mechanical complication of long-term central venous access devices. Catheter fractures are well-known complications of subclavian central venous long-term cannulation: the most important cause of embolization is the "pinch-off syndrome" (1-3).

It is believed that such complications, though usually asymptomatic, may lead to a number of severe sequelae such as cardiac arrest, vascular and cardiac perforation, and pulmonary embolism (4). Therefore, most authors agree that dislocated catheter fragments should be removed as soon as possible, ideally by a non-traumatic procedure, such as a percutaneous interventional radiological technique (3, 5-7).

In hemodialysis this is an exceptional event. It is more seldom observed in a tunnelized access (twin-cath catheter) during a dialysis session and after one year of successful use.

We report an exceptional case of accidental rupture with distal migration and transvenous retrieval of a central embolized fragment of a cuffed hemodialysis catheter.

CASE REPORT

In a 73 year-old-man in hemodialysis treatment with cuffed tunnelled catheter for 3 months, we substituted the catheter due to its malfunctioning, probably due to fibrin sleeve.

It was an Ash-split type catheter (Medcomp, Harleysville, USA) with the following characteristics: dual lumen, modified polyurethane (Bioflex), 14 F diameter, 28 cm long.

The catheter substitution was performed under local anesthesia by means of an incision at the Sedillot triangle level. We isolated and fastened the catheter with a clamp. The catheter was then cut and a guide-wire was introduced in the venous side.

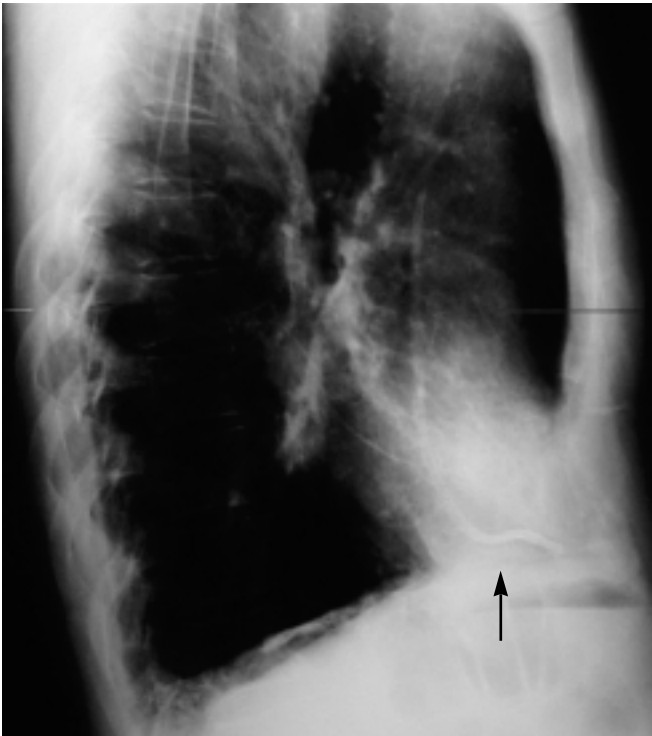


Fig. 1 - Chest-X-ray showing an embolized catheter; the end of the fragment is located in the right ventricle.

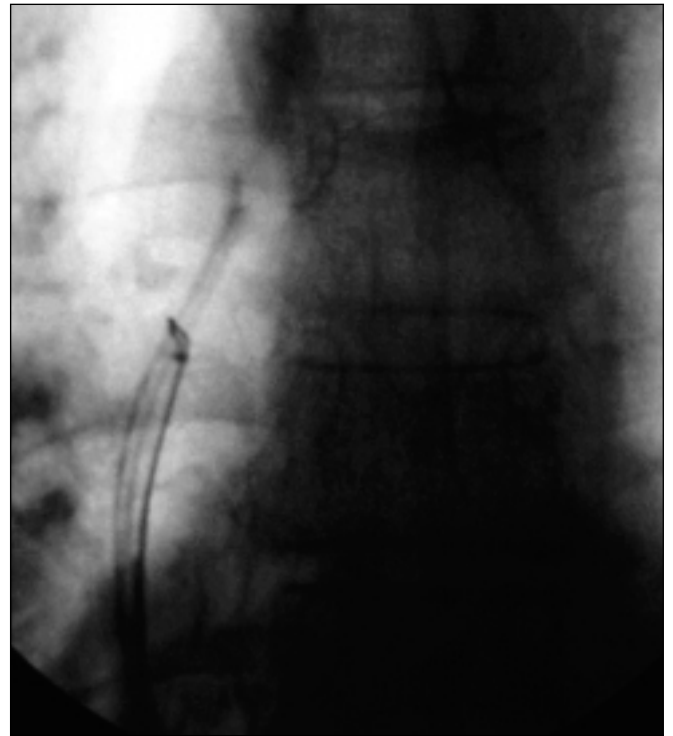


Fig. 2 - The catheter hooked by the snare loop.

The distal fragment had been previously clamped with the aim of replacing the new catheter via the guide-wire. During the procedure the disconnected fragment embolized in the right ventricular cavity without clinical manifestations. The patient was referred to a center with adequate experience in interventional radiological techniques, where after 24 hours, percutaneous transvenous retrieval was performed through the left transfemoral route, using a single-snare-loop device without complications (Figs. 1-5).

Hemodialysis treatment was continued by means of femoral silicone catheter for temporary access. A loop prothetic A-V fistula was performed subsequently in the left forearm.

DISCUSSION

The actual rate of central venous catheter fracture and embolization is unknown, since this complication is usually reported in the literature as single-case reports, or for a small number of cases. In case of subclavian vein positioning, the “pinch-off syndrome” is the most frequent cause of catheter embolization (2, 3, 5, 8).

The syndrome is characterized by the mechanical friction of the catheter between clavicle and first



Fig. 3 - Initial phase of percutaneous retrieval maneuver.



Fig. 4 - *Fragment displaced in inferior cava vein.*

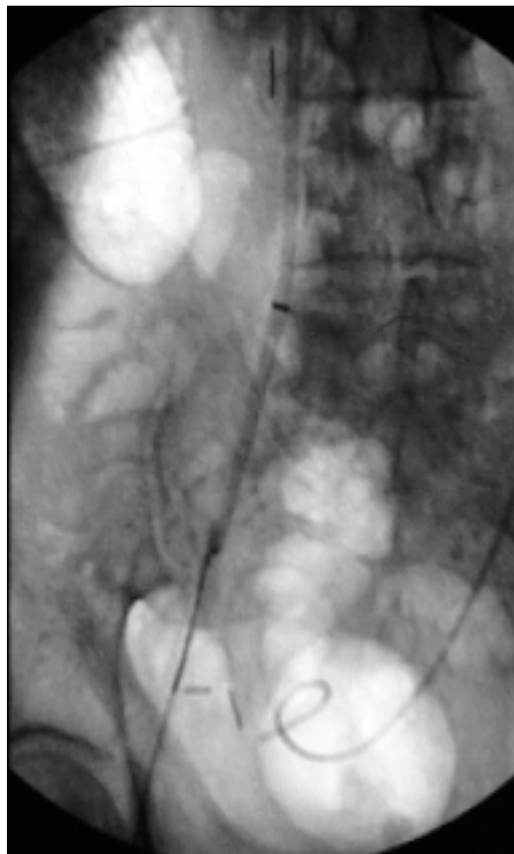


Fig. 5 - *Retrieval of embolised catheter by transfemoral approach.*

rib. Clinically, this compression may be associated with intermittent catheter dysfunction, improved with changes in the patient's shoulder position. According to most reported cases (9), intravascular catheter separation usually occurs completely asymptotically. Our report confirms that catheter embolization itself is usually asymptomatic. Less than one third of the literature-reported cases have associated symptoms, such as palpitations or chest discomfort.

However, it is commonly recommended that dislocated catheter fragments should be removed as soon as possible and the interventional radiological catheter technique should be considered the method of choice (5-7). This technique is non-invasive and safe if performed by an experienced team, and has a very high success rate (5).

The technique we normally utilized for the replacement of permanent central venous catheters consists in the simple removal of the previous catheter and in the introduction of the new one by the same route via guide-wire, preserving the venotomy site. It is important that the patient be checked for a fibrin sheath prior to inserting the new catheter. It is possible to place the new catheter

back into the retained sheath and have the same problem within a short time, especially in patients not undergoing anticoagulation therapy.

Advantages of this procedure are that it preserves the venotomy site and has a low reported complication rate, it is less expensive than fibrin sheath stripping, and has a high rate of success. Disadvantages of this technique are that a new catheter exit wound is created with its associated risks of bleeding and infection, and that there is the risk of intravascular migration of the catheter fragments.

We conclude that the replacement of permanent cuffed hemodialysis catheters via guide-wire is a delicate procedure and if catheter embolization is diagnosed, the patient must be referred to a center with specific experience in the retrieval of intravascular objects.

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