



Case report

Stuck chemotherapy central venous catheter, an uncommon complication. Recovery techniques

Catéter venoso central de quimioterapia atascado, una complicación poco común. Técnicas de recuperación

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Abstract

Introduction: completion of the oncological treatment is the main reason for removing the central venous catheter (CVC). Failure to remove the CVC is a rare complication resulting from adherence to the wall of the vessel. Frequency of the complication of removal is estimated between 2 and 3 %, however some studies have found frequencies up to 16 %.

Case report: we discuss the case of a patient presenting failure of CVC removal, while using open technique, due to firm adherence to the vessel wall. After suspending the initial procedure, we performed a hybrid method (open / endovascular) resulting in a successful procedure.

Resumen

Introducción: la finalización del manejo oncológico es la principal indicación para la retirada del catéter venoso central (CVC). La extracción fallida es una complicación poco común que se debe a la adherencia con la pared venosa. La frecuencia de esta complicación se estima entre el 2 y el 3 %, pero algunos estudios muestran frecuencias de hasta el 16 %.

Caso clínico: presentamos el caso de una paciente a la que se intentó retirar el CVC por vía abierta, pero el procedimiento resultó fallido dada su firme adherencia, por lo que el procedimiento se suspendió y se programó otra intervención de manera híbrida (abierta/endovascular), que resultó exitosa.

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INTRODUCTION

The complications associated with the placement of a central venous catheter (CVC) are well-documented, but less attention is paid to complications occurring during its removal. Adhesion and the inability to remove the catheter are rare complications of this procedure, caused by adherence to the venous wall (1).

Albertos N. et al. (2) describe a total of 174 procedures performed over 8 years, reporting a 2.87 % incidence of this complication. Wilson et al. (3) note that 16 % of their patients experienced complications during removal, which were resolved via venous dissection, except for 3 cases in which the catheter remained firmly adhered to the vessel and a remnant was left.

We present the case of a patient who underwent a failed initial attempt to remove the catheter via open surgery and later underwent a successful hybrid procedure (open/endovascular).

CASE REPORT

A 17-year-old patient had a chemotherapy catheter placed via right jugular access in 2018 for cancer treatment of an aggressive form of deep fibromatosis in the right forearm. Following the completion of treatment, it was decided to remove the CVC. In 2024, an open removal attempt proved unsuccessful despite multiple efforts.

The procedure was postponed to schedule a hybrid approach after a Doppler ultrasound revealed the pres-

ence of a hyperechoic material associated with an old, partially recanalized thrombus (30 %) encasing the catheter inside a short segment of the internal jugular vein adjacent to the right jugular-subclavian junction.

In March 2024, the patient was taken back to the operating room. An incision was performed over the previous scar, revealing fibrosis along its entire course. The reservoir was exposed under fluoroscopy, which showed a fractured catheter (Fig. 1A). The proximal catheter was removed, revealing a distal segment located in the jugular-subclavian junction and superior vena cava inside the thrombus (Fig. 1B).

Heparinization was administered at 80 IU/kg, and the femoral vein was punctured under ultrasound guidance. A 5-Fr introducer sheath, a hydrophilic guidewire, and a multi-purpose catheter were advanced to the superior vena cava, cannulating the jugular and subclavian veins. A 6-Fr introducer sheath was exchanged to deploy a trilobed Snare® catheter loop (Standard Snare, EN2006020, 12-20 mm; Merit Medical Systems, South Jordan, Utah, USA), which captured and extracted the catheter segment (Fig. 2A).

A fluoroscopic review revealed no additional fragments, only the previously described thrombus. A final duplex examination confirmed the absence of the catheter and visualized the thrombus, while the right femoral vein exhibited good flow and no presence of thrombosis whatsoever. The procedure was deemed successful. The catheter and fibrotic tissue were sent to a pathology lab. A metal wire was used for suturing with Perclose ProGlide (Perclose ProGlide Suture-Mediated Closure System®; Abbott Vascular Inc., Redwood City, California, USA) and the subclavian wound was closed with prior hemostasis.

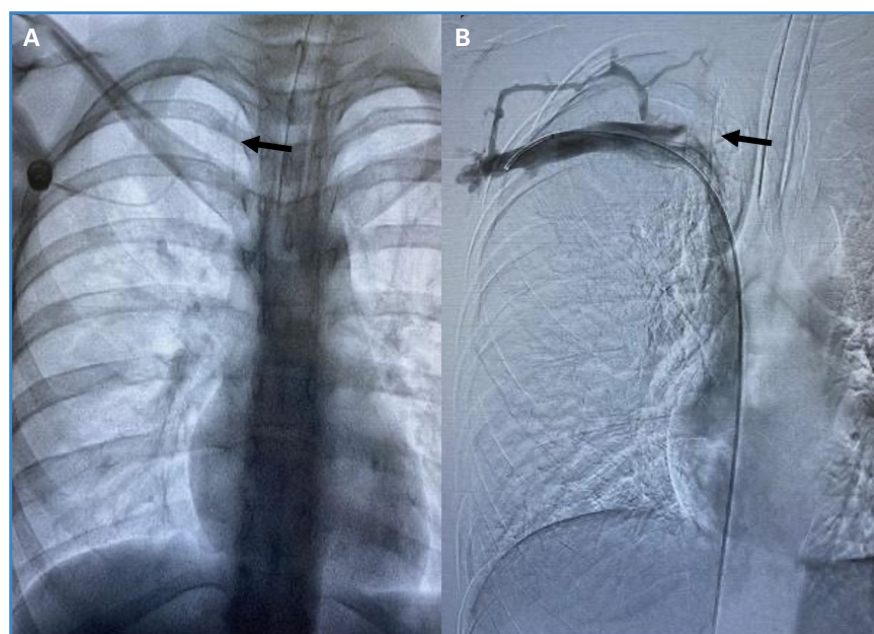


Figure 1. A. Anteroposterior X-ray showing the fractured catheter segment (black arrow). B. Fluoroscopic venography showing the catheter segment (black arrow) in the jugular-subclavian confluence and superior vena cava inside the thrombus.

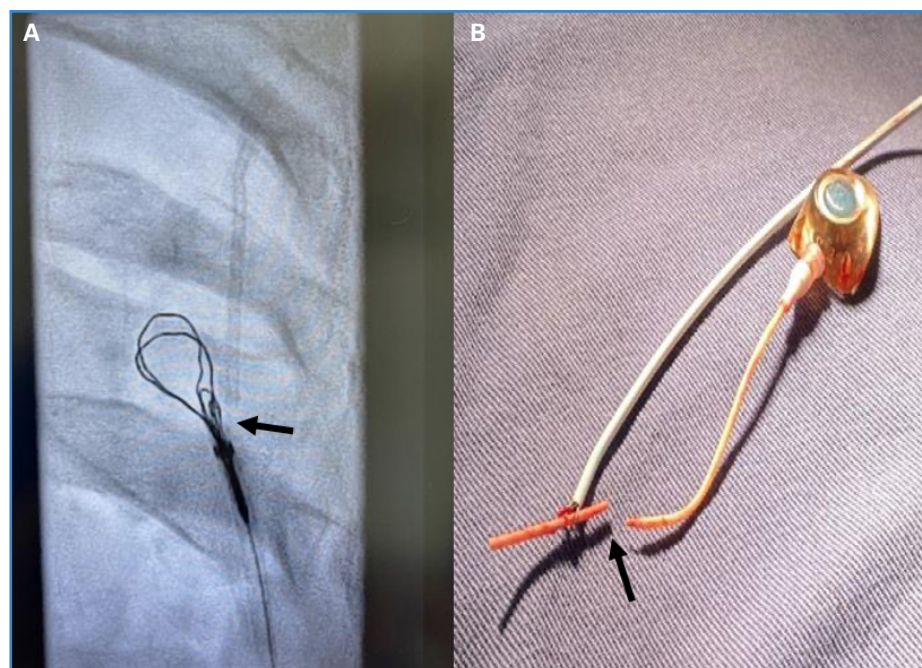


Figure 2. A. Trilobed Snare® catheter loop (black arrow). The catheter tip is visible before extraction. B. Fractured catheter after removal (black arrow).

The patient remained in observation care for 24 hours without complications and was discharged with full anticoagulation.

DISCUSSION

Completion of cancer treatment is the primary indication for CVC removal (74 %), followed by infection and thrombosis (4).

One complication of removing implantable catheters is their adherence to the venous wall. Although the cause remains unclear, it is thought to result from fibrin capsule formation around the catheter due to endothelial injury during placement and the inflammatory response, leading to granulation tissue and fixation between the venous wall and the catheter (2).

Wilson et al. (3) report that among 200 patients who underwent catheter removal, 16 % experienced complications; 28 required a second incision, 5 underwent phlebotomy, and in 3 cases, the catheter could not be removed. The mean duration of catheter placement was 29 months (3).

Various techniques for removing adhered catheters are described in the literature. Chan BKY et al. used angiography to remove the catheter via transfemoral antegrade Snare® catheter (5). Huang S-C et al. described a technique involving guidewire insertion into the catheter lumen and applying simultaneous “push” forces to

the guidewire and catheter, causing gradual detachment from the vessel wall (6).

Wilson et al. (3) described performing a second incision over the venous insertion site followed by phlebotomy. If removal was impossible, leaving a remnant did not result in additional complications (3).

Awan MY et al. described opening the fibrous sheath around the catheter without phlebotomy to allow guidewire insertion. After the guidewire extended beyond the tip of the catheter, fluoroscopy confirmed its position. Gentle traction was applied to the catheter and guidewire as a single unit (4), a very similar procedure to that described by Huang S-C (6). Hong et al. reported using endoluminal balloon angioplasty to expand the vein, breaking adhesions between the venous wall and the catheter, thus allowing removal. This technique is not recommended in young children due to the fragility and small size of their veins (7).

CONCLUSIONS

One complication of catheter removal is adhesion to the venous wall, reported in approximately 2 % up to 3 % of cases. Several techniques have been reported in the literature. Currently, the ideal technique is one that minimizes morbidity and mortality. A hybrid technique (open/endovascular) is preferred for ensuring patient safety and complete device removal.

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