Percutaneous removal of fragmented central venous catheters: an invaluable technique for solving a grave complication

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Introduction:

Fracture and migration of a port-catheter following long-term access to the central venous vasculature is a rare clinical scenario. Consequences can include the fragmented device moving into the right atrium or ventricle, which may eventually cause life-threatening complications such as arrhythmias, pseudoaneurysms, perforations and embolisation. Furthermore, catheter fragments in the heart can lead to infective endocarditis and require urgent removal.

Methods:

Between January 2020 and December 2025, 27 patients were referred to the Interventional Radiology Unit at our hospital for the percutaneous removal of a fractured central venous catheter port.

All patients were oncology patients and all ports were chest ports. Fifteen patients were female (56%). All catheters were removed under fluoroscopic guidance in a single session using local anaesthesia and a triple-endovascular snare.

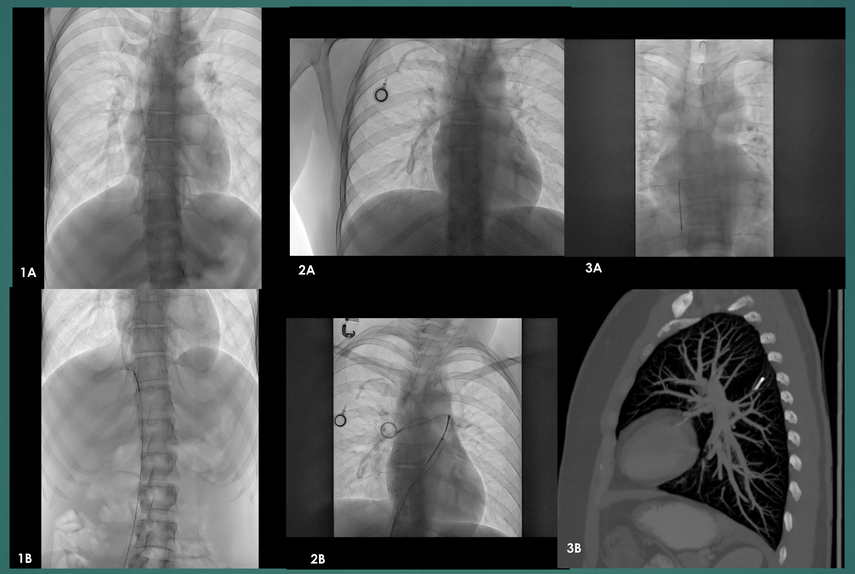

Fig. 1 a) Snapped silicon port catheter in the right atrium, B) percutaneously retrieved from the femoral vein using a snare

Fig. 2 A) Port catheter broken in 3 places, with the central tip inside the right pulmonary artery, B) percutaneously retrieved from the femoral vein using a snare

Fig. 3 A) Snare traction attempt of Silicon Port catheter completely embedded in the SVC-L BCV wall of a 40-year-old man, 10 years after placement, B) the traction resulted in snapping of the tip with the Groshong valve, which subsequently embolized a pulmonary artery branch at the apical segment of the L Lower Lobe

Results:

All percutaneous venous accesses were ultrasound-guided. In four cases, the right internal jugular vein (IJV) was accessed, while in the rest, femoral vein access was used (Fig. 1). Twenty-six fragmented catheters were located in the superior vena cava (SVC), right atrium (RA) and right ventricle (RV). One catheter was retrieved from the right pulmonary artery (Fig. 2). Three cases required bilateral femoral vein access for complex catheter manipulation. Twenty-six out of 27 catheters were successfully removed percutaneously. One catheter was deemed non-removable after an unsuccessful traction attempt with the snare due to adhesions forming between the SVC and subclavian vein. This patient was the only one to experience fragment embolisation, with a small part of the catheter tip snapping off under traction and subsequently becoming embolised in the pulmonary vasculature (Fig. 3).

Conclusion:

Although rare, fragmentation of central venous catheters is a serious complication, and percutaneous retrieval is an invaluable technique with a high success rate that can prevent more dire consequences.

References:
1) Pietrasik A, Gąsecka A, Juśkiewicz A, Lewandowski P, Stelmach D, Kochman J. Percutaneous removal of a catheter fragment from the right atrium. Cardiol J. 2021;28(6):997-998. doi: 10.5603/CJ.2021.0146. PMID: 34985125; PMCID: PMC8747828.
2) Cheng CC, Tsai TN, Yang CC, Han CL. Percutaneous retrieval of dislodged totally implantable central venous access system in 92 cases: experience in a single hospital. Eur J Radiol. 2009 Feb;69(2):346-50. doi: 10.1016/j.ejrad.2007.09.034. Epub 2007 Oct 31. PMID: 17976941.
3) Perdikakis E, Kehagias E, Tsetis D. Common and uncommon complications of totally implantable central venous ports: a pictorial essay. J Vasc Access. 201Kehagias E, Galanakis N, Tsetis D. Central venous catheters: Which, when and how. Br J Radiol. 2023 Nov;96(1151):20220894. doi: 10.1259/bjr.20220894. Epub 2023 May 25. PMID: 37191031; PMCID: PMC10607393.2 Jul-Sep;13(3):345-50. doi: 10.5301/jva.5000055. PMID: 22307469.