

A Challenging Hickman Central Venous Line Insertion

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Abstract

This is a case of a middle-aged man with intestinal failure following extensive bowel resection after severe mesenteric vein thrombosis. He is dependent on parenteral nutrition but has had multiple Hickman lines, leading to problematic central vein occlusion bilaterally.

Keywords: Hickman Line, Parenteral Nutrition.

INTRODUCTION

A Hickman is a type of tunnelled central venous catheter. It is used for long-term access to central veins and can be used to give IV medications, chemotherapy, parenteral nutrition, and to draw blood.^[1] Traditionally, Hickman catheter insertion is usually accomplished surgically by means of either cutdown on the cephalic or jugular veins or percutaneous placement in the operating room.^[2] Hickman lines can be a major challenge in patients who need repeated access when central veins become occluded. Their insertion can be complicated by infection, air embolism, arterial injury and venous stenosis or occlusion. This case is an example of life-preserving venous intervention to enable long-term parenteral feeding in a patient with a background of intestinal failure and occluded central veins. In this case, advanced techniques were required for successful line insertion. As is common for interventional radiology

line but his most recent line, which was removed 10 days prior, was a left subclavian line which had been removed due to infection. He was referred to the Interventional Radiology service for a new line.

IR PROCEDURE

The procedure began with infiltration of local anaesthetic and ultrasound-guided access to the left subclavian vein but it was not possible to cross the occluded innominate vein antegradely. The next step was two further ultrasound-guided accesses, this time to right internal jugular vein and right common femoral vein. It was again not possible with standard manipulations of wires and catheters, or with a Beback re-entry device (Cook Medical, USA), to cross the innominate vein occlusion on the right. It was possible from the right femoral access to pass a wire via mediastinal collaterals into an unnamed vein in the anterior left neck, running between the thyroid and the left common carotid artery. An Amplatz Goose Neck[™] microsnare (Medtronic, USA) was advanced into this vein and a 21G needle was passed with a combination of fluoroscopic and ultrasound guidance onto the snare. This enabled a 0.018" wire to be snared and pulled through from the left neck to the right femoral access. This trans-collateral pathway was cautiously dilated to 5mm with standard angioplasty balloons, allowing a 9-French peel-away sheath to be advanced into the superior vena cava. A 9-French single-lumen Hickman

BACKGROUND

This is a case of a 46-year-old man with a history of extensive small bowel resection following porto-mesenteric vein thrombosis several years previously. The patient had been dependent on parenteral nutrition for seven years and in that time had developed occlusions of the left internal jugular and bilateral innominate veins following several Hickman lines, at least two of which had developed significant line-related infections. Two years previously he had undergone sharp recanalisation of his right innominate vein for insertion of a right subclavian

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line (Vygon, UK) was then tunnelled via the chest wall and inserted via the peel-away sheath to the cavo-atrial junction. The patient required a total of 150 micrograms of intravenous fentanyl towards the end of the procedure given that manipulations of wires, snares and catheters in the mediastinal collateral circulation was moderately uncomfortable.

DISCUSSION

The implantation of permanent (>14 days) central venous catheters is constantly increasing, accelerated by a trend toward outpatient therapies. Subcutaneous tunneled and non-tunneled catheters as well as port systems are available. The interventional radiologist plays an important role in the implantation of central venous catheters as well as in detection and treatment of any complications.^[3] This case is an example of a challenging but ultimately successful venous intervention demonstrating the role of interventional radiology in providing life-preserving patient care. It also shows some innovative techniques that can help with difficult central venous occlusions, including the need for multiple points of venous access and use of snares and through-and-through wires. The transcollateral route can allow placement of Hickman lines when more standard anatomical approaches are unsuccessful. Still, it is worth noting that the trans-

collateral approach can be uncomfortable and may require additional intravenous analgesia.

CONCLUSION

This case shows the importance of IR procedures in patient care and demonstrates radiologic Hickman catheter insertion offers significant advantages over traditional surgical placement. Perseverance is very important with cases where there is likely to be significant clinical benefit at the end of it. Sometimes success only comes at the end of a long and difficult procedure. Patient co-operation is very crucial and procedural analgesia/sedation may be crucial to a good outcome.

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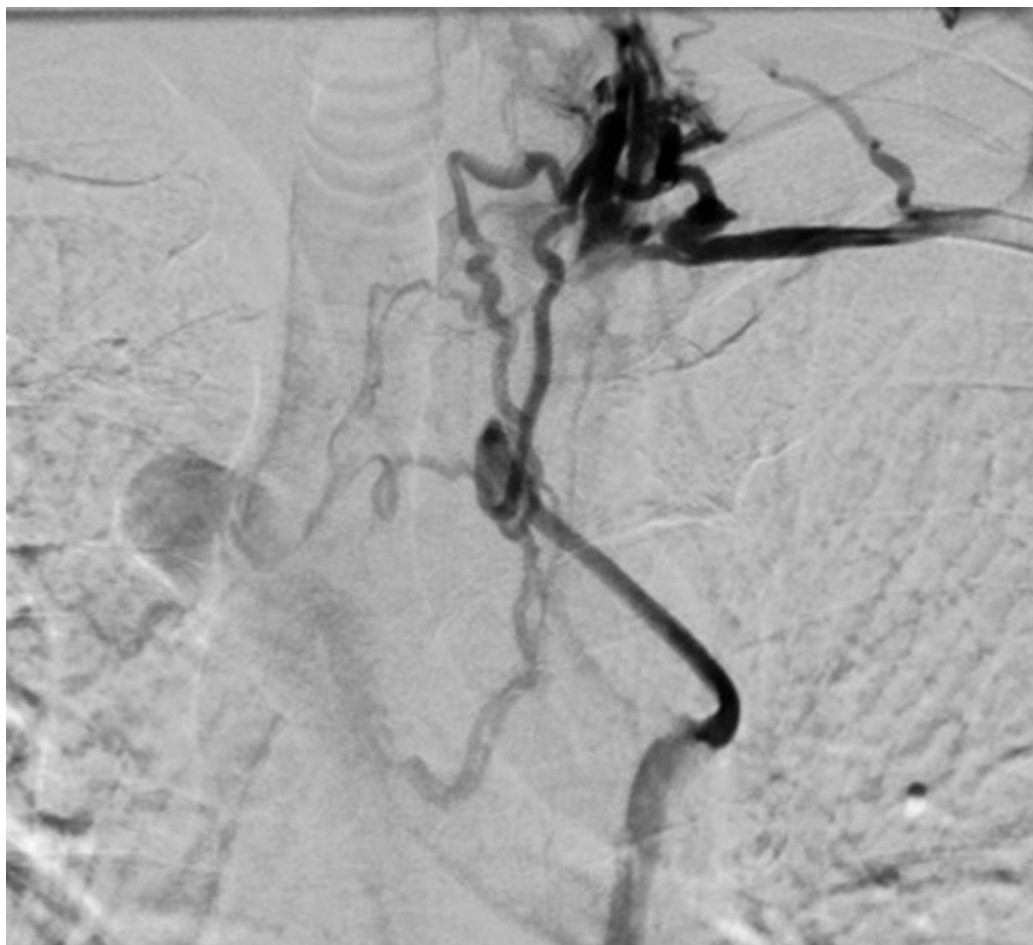


Figure 1: Venogram from Left Subclavian Vein.



Figure 2: Simultaneous Venogram from Right Jugular Vein and Right Femoral Access (catheter in left innominate vein).

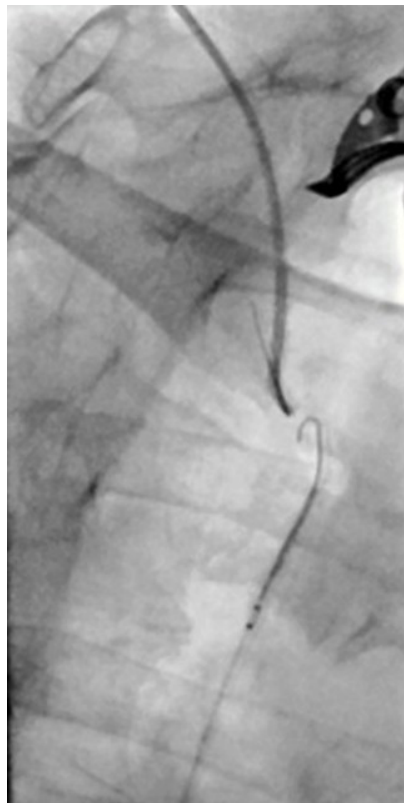


Figure 3: Attempted Sharp Re-canalisation of Right Innominate Vein.



Figure 4: Catheter Advanced from Right Femoral Access Via Collaterals into Neck.



Figure 5: Percutaneous Puncture and Wire Snared into the Vein and Pulled Down to Establish Access.



Figure 6: Collateral Pathway Ballooned to allow Passage of Peel-away Sheath.



Figure 7: Trans-collateral Hickman Line in Position with the Tip in Right Atrium.